INVITATION TO BID

ITB NO: ITB B-17-156

TITLE: LIFT STATION 9 REHABILITATION

AVAILABLE: June 25, 2017

MANDATORY PRE-PROPOSAL 10:00 AM on July 6, 2017
CONFERENCE & SITE VISIT: Davie Town Hall Council Chambers
6591 Orange Drive
Davie, FL 33314

DUE DATE: 2:00 PM EST on July 27, 2017

SUBMIT TO: TOWN OF DAVIE - Procurement Division
Attn: Brian K. O'Connor, C.P.M.
6591 Orange Drive
Davie, FL 33314

COUNCIL APPROVAL: AUGUST 2017

BONDS: 5% BID BOND
100% PAYMENT & PERFORMANCE BOND
TOWN OF DAVIE

Lift Station No. 9 Rehabilitation

SPECIFICATIONS

Prepared by:

Calvin, Giordano & Associates, Inc.
EXCEPTIONAL SOLUTIONS™

June 2017
CGA Project No. 96-1630.120
Bid No. B-17-156
<table>
<thead>
<tr>
<th>Official</th>
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<tr>
<td>Mayor</td>
<td>Judy Paul</td>
</tr>
<tr>
<td>Vice Mayor</td>
<td>Marlon Luis</td>
</tr>
<tr>
<td>Council Member</td>
<td>Caryl Hattan</td>
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<tr>
<td>Council Member</td>
<td>Bryan Caletka</td>
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<tr>
<td>Council Member</td>
<td>Susan Starkey</td>
</tr>
<tr>
<td>Town Administrator</td>
<td>Richard J. Lemack</td>
</tr>
<tr>
<td>Town Attorney</td>
<td>John Rayson</td>
</tr>
<tr>
<td>Procurement Manager</td>
<td>Brian K. O’Connor</td>
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<td>Utilities Director</td>
<td>Don Bayler</td>
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TOWN OF DAVIE
Lift Station No. 9 Rehabilitation

PROJECT NO. 96-1630.120

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NOTICE TO BIDDERS

The Town of Davie is accepting sealed bids until **2:00 p.m. on July 27, 2017**, for the following:

**Lift Station No. 9 Rehabilitation**

**BID NUMBER B-17-156**

Bids based on any one part of the work will not be considered. Bidders will therefore confine their bids to the project in its entirety.

The Bidder will submit, along with the Bid, (a) evidence that he or she is licensed to perform the work and services, and (b) evidence that he or she has successfully performed at least two contracts for a public entity in the last three years, and (c) a certified check or bid bond in the amount of five percent (5%) of the base bid as the guarantee that the bidder, if awarded the contract, will, within seven (7) consecutive days after written notice, be given such award, enter into a written contract with the Town of Davie in accordance with his or her accepted bid, and the bidder will submit payment and performance bonds satisfactory to the Town of Davie, equal to one hundred percent (100%) of the contract price and will submit other required documents as needed.

Bid documents and plans can be downloaded on the Town’s website at [www.davie-fl.gov](http://www.davie-fl.gov) or by visiting [www.demandstar.com](http://www.demandstar.com). Contractors may also purchase printed documents by providing a nonrefundable payment of **$100.00**, payable by cashier’s check, money order or cash, to Calvin, Giordano & Assoc., the Engineer and Agent for the Owner, located at 1800 Eller Drive – Suite 600, Ft. Lauderdale, FL 33316, phone 954-921-7781. Please call twenty-four (24) hours in advance to order sets. Bidders will be required to provide a business card in order to pick up documents. Partial sets of plans will not be available.

No bidder may withdraw his/her bid for a period of ninety (90) days after the date set for opening of bids.

Companies that do not wish to bid for this purchase, but would like to be notified of future bids, should submit a “NO BID” response.

A mandatory pre-bid conference will be held at the Town of Davie Council Chambers, located at 6591 Orange Dr., Davie, FL 33314 on **July 6, 2017** at 10:00 a.m. All interested Contractors planning to submit a Bid must attend this meeting. A site visit shall immediately follow the pre-bid conference to allow access to the pump station. Location is 2981 N. 73rd Ave., Hollywood, FL.

Sealed bid envelopes, containing three (3) copies of the bid, (one copy (1) clearly marked “Original” with two (2) additional copies) and one (1) electronic should be marked with the bid name and number, and boldly marked “SEALED BID”. All sealed bids should be delivered no later than **2:00 p.m. on July 27, 2017**, to the Purchasing Division, 6591 Orange Drive, Davie, Florida, 33314. Bids will be opened on or about **2:00 p.m. on July 27, 2017**, at the Davie Town Hall. This will be a public bid opening.

The Town of Davie reserves the right to reject any and/or all bids.

TOWN OF DAVIE, FLORIDA

_________________________
Brian K. O'Connor
Procurement Manager
NOTICE TO BIDDERS

SUPPLEMENT

NOTICE IS HEREBY GIVEN that the Town of Davie Utilities Department is seeking sealed bids for the following work as specified in Documents 00300 and 00400.

TOWN OF DAVIE

Lift Station No. 9 Rehabilitation

BID NUMBER B-17-156

Description of the Bid
The Contractor shall provide a lump sum bid for all work performed for Lift Station No. 9, Town of Davie. The project consists of rehabilitation of existing Lift Station No. 9. The project is fully described in the Section 01010 – Summary of Work.

Bidding Documents
The bidding documents will not be mailed or shipped overnight unless the purchaser provides a FedEx account number. All bidders must make their own arrangements to pick up the bid package at Calvin, Giordano & Assoc., the Engineer and Agent for the Owner, located at 1800 Eller Drive – Suite 600, Ft. Lauderdale, FL 33316, phone 954-921-7781.

The Trench Safety Form must be completed in its entirety and submitted as part of the bid.

The Town of Davie reserves the right to reject any and all bids, to waive any and all informalities or irregularities and to accept or reject all or any part of any bid as they may deem to be in the interest of the citizens of the Town of Davie.

TOWN OF DAVIE, FLORIDA

_________________________
Brian K. O'Connor
Procurement Manager

END OF DOCUMENT
INSTRUCTIONS TO BIDDERS

1. SUBMITTAL

1.1 Sealed Bids will be received until the time and date specified in the Section 00010 Notice to Bidders.

1.2 Each Bid shall be submitted in a sealed envelope, plainly marked:

   To:       Mr. Brian K. O'Connor
             Town of Davie
             6591 Orange Drive
             Davie, Florida 33314

   Bid for:   Lift Station No. 9 Rehabilitation

   Bid No.    B-17-156

   Submitted by: ____________________________________________

   ____________________________________________

   ____________________________________________

1.3 If said Bid is forwarded by mail, it shall be enclosed in another envelope addressed to Mr. Brian K. O'Connor the Procurement Manager, Town of Davie, Florida. Bids will be received at the Town Hall until the time and date specified in the Section 00010 Notice for Bidders. Bids received after the time and date specified will not be considered.

2. BIDS

2.1 It is understood by the bidder that the quantities in the specifications are for bid comparison only.

2.2 Bids shall be made upon forms provided for that purpose in Documents 00300, 00450, 00500, 00650 and 00680. Erasures or other changes in a Bid shall be explained or noted over the signature of the Bidder. Each Bidder shall submit sealed Bid envelopes containing one original, two copies and one electronic of the Bid and its accompanying questionnaire, and should be marked with the Bid name and number and boldly marked "SEALED BID". The forms must be submitted in good order with all blanks filled in.

2.2.1 Vendors shall return a completed Form W-9 (see Section 00300) and completed Vendor/Bidder Disclosure Form (see Section 00300) with their bid.

3. IRREGULAR BIDS

3.1 Bids which are incomplete, conditional, which contain additions not called for, alterations or irregularities of any kind may be rejected.
4. **SIGNATURES ON BIDS**

4.1 Each Bidder shall sign Bid with his or her full name, company name and address. In cases where a firm or corporation submits a Bid, the Bid shall be signed with the full name of each member of the firm, or by the name of the officer or officers authorized by its by-laws, in addition to the firm or corporation signature with its official seal affixed hereto.

5. **EXAMINATION OF CONTRACT DOCUMENTS**

5.1 Bidders are notified that they must thoroughly examine the Contract Documents and Specifications which include the Notice for Bidders, Instructions to Bidders, Bid Form, Form of Contract, General Conditions, Supplementary Conditions, Technical Specifications, Figures, and any Addenda issued prior to the opening of Bids.

6. **EXAMINATION OF SITE**

6.1 Each Bidder shall visit the site of the proposed work before submitting Bid and shall fully acquaint themselves with conditions relating to construction and labor so that he or she may fully understand the facilities, difficulties and restrictions attending the execution of work under the Contract. It will be assumed that the Bidder has investigated and is satisfied as to the conditions of work to be performed and materials to be furnished and shall base Bid on their own opinion of the conditions likely to be encountered, and for the bid price must assume all risk of variance, by whomsoever made in any computation or statement of amounts or quantities necessary to fully complete the work in strict compliance with the Contract Documents.

6.2 Each Bidder shall thoroughly examine and be familiar with the plans and specifications. The failure or omission of any Bidder to receive or examine any form, instrument, addendum or other documents, or to visit the site and acquaint themselves with conditions there existing, shall in no way relieve any Bidder from any obligation with respect to their Bid or to the Contract. The submission of a Bid shall be taken as prima facie evidence of compliance with this document.

6.3 No plea of ignorance of conditions that exist or that may hereafter exist, or of conditions or difficulties that may be encountered in the execution of the work under this Contract, as a result of failure to make the necessary examinations and investigations, will be accepted as an excuse for any failure or omission on the part of the Contractor to fulfill, in every detail, all of the requirements of Contract Documents, nor will they be accepted as a basis on any claim whatsoever for extra compensation or for any extension of time.

7. **DISCREPANCIES**

7.1 Should a Bidder find discrepancies or ambiguities in, or omissions from, the Drawings or Specifications, or should they be in doubt as to their meaning, they shall at once notify the Engineer.

8. **INTERPRETATION OF PLANS AND DRAWINGS**

8.1 On all drawings, the figured dimension shall govern in case of discrepancy between the scales and figures. The Contractor shall take no advantage of any error or omission in the Drawings or of any discrepancy between the Drawings and Specifications. The Engineer of Record shall make such interpretations as may be deemed necessary for the fulfillment
of the intent of the Drawings and Specifications as construed by the Engineer, and his/her decision shall be final. If there is a discrepancy between plans and specifications, the specifications govern.

9. INTERPRETATION OF CONTRACT DOCUMENTS PRIOR TO OPENING OF BIDS

9.1 If any person contemplating submitting a Bid for the proposed Contract is in doubt as to the true meaning of any part of the Drawings, Specifications or other proposed Contract Documents, they may submit to the Engineer a written request for an interpretation thereof. The person submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by addenda duly issued, and copies of such addenda will be mailed or delivered to each person receiving a set of such documents. Request for interpretations or clarification of the Contract Document must be made in writing not later than five (5) calendar days prior to time of Bid opening. The Owner will not be responsible for any other explanation or interpretation of the documents.

10. TIME OF COMPLETION

10.1 All work for this project shall be completed in accordance with Document 00300, paragraph 7.

10.2 Completion of the project shall imply trouble free system operation as recognized by the Owner or the Engineer of Record.

10.3 All requests for additional days due to delays that are not the fault of the Contractor shall be made to the Owner in writing within 24 hours of the onset of the delay, including rain days, in order to be considered.

11. LABOR REGULATIONS

11.1 The Contractor shall fully comply with all laws and regulations concerning labor, work hours, wage rates, labor conditions and related matters.

12. BID BONDS

12.1 The Bid Bond, in the amount of not less than five percent (5%) of the Bid, shall be paid into the funds of the Owner as damages if the Bidder fails to execute the written agreement and furnish the required Contract Security Bond within seven (7) consecutive calendar days following written notice of award of the Contract. The Bid Bond shall be countersigned by an agent of the surety company licensed to operate in the State of Florida.

13. RETURN OF BID SECURITY

13.1 Bid Bonds of the unsuccessful Bidders will be returned to the parties submitting same not later than fifteen (15) days after the execution of the Contract. In the event that all Bids are rejected, the Bid Bonds will be returned to all Bidders within fifteen (15) calendar days after date of rejection.

14. CONTRACT BONDS

14.1 The successful Bidder shall furnish a Performance Bond in an amount of at least equal to one hundred percent (100%) of the Contract price as security for the faithful performance
of this Contract and shall also furnish a Payment Bond in the amount of at least one hundred percent (100%) of the Contract price for payment of all persons performing labor on the project under this Contract. The Surety on such Bonds shall be by a duly authorized surety company satisfactory to the Owner.

15. QUALIFICATION OF BIDDER

15.1 A Bidder will be required to show, to the complete satisfaction of the Owner, that they have the necessary facilities, equipment, ability, and financial resources to perform the work in a satisfactory manner, within the time specified. No Contract will be awarded except to responsible Contractors and businesses capable of performing the class of work contemplated. The Bidder shall submit the Qualification Form (Section 00450) with Bid. The Contractor must be in business for at least 10 years, and completed 5 projects of a similar nature and size or larger at water and or wastewater pump stations.

16. DISQUALIFICATION OF BIDDERS

16.1 Any or all Bids will be rejected if there is any reason for believing that collusion exists among the Bidders, and participants in such collusion will not be considered in future Bids for the same work.

17. WITHDRAWAL OF BIDS

17.1 A Bidder may withdraw Bid provided that request is made in writing and delivered either in person or by special delivery mail to the Owner prior to the time set for opening bids.

18. OWNER’S RIGHTS RESERVED

18.1 The Owner reserves the right to accept any Bid which, in their opinion, is the lowest and best, and is in the best interest of the Owner. The Owner also reserves the right to reject any and all bids.

19. AGENT FOR OWNER

19.1 Calvin, Giordano & Associates, Inc. (the Consulting Engineers) shall serve as agent for The Town of Davie (the Owner), in all matters pertaining to the work on this project. No changes in the work or extra charges to the Contract are effective until recommended by the Engineer and approved by the Owner in the form of a written change order.

20. QUALIFICATION OF SURETY

20.1 The Contractor may provide a Surety Bond executed by a corporate surety company authorized to do business in the State of Florida, holding a certificate of authority from the Secretary of the Treasury of the United States as acceptable sureties on Federal Bonds and executed and issued by a resident agent licensed and having an office in the State of Florida, and resident agent in Broward County representing such corporate surety. Said Surety Bond or its equivalent shall be in effect prior to the issuance of any work permits and shall remain in effect until the provision of the agreement to transfer ownership of any improvements have been fulfilled. The surety bond rating shall be rated at least as A or higher.
21. **SUBCONTRACTORS**

21.1 Unless otherwise specified in the Contract Documents or in the Instructions to Bidders, the Contractor shall furnish, concurrently with Bid submission, a list of names for the proposed subcontractors for all parts of the work.

21.2 Upon the Engineer's request, submit the name, address and phone number, occupational license number and specialty. Indicate at least three (3) references and three (3) projects of similar nature.

21.3 The Engineer shall promptly notify the Contractor, in writing, if either the Owner or Engineer, after due investigation, has reasonable objections to any subcontractor on said list and does not accept them. Failure of the Owner or Engineer to make objection within three (3) weeks to any subcontractor on the list shall constitute acceptance of such subcontractor. After acceptance, no subcontractor shall be changed without written approval by the Owner and Engineer.

22. **INSURANCE**

22.1 The Bidder's attention is directed to the insurance requirements set out in the Supplementary Conditions herein. The Successful Bidder will be required, prior to execution of the Contract by the Owner, to furnish a Certificate of Insurance and will cause to be issued by the insurance carrier, an endorsement naming the Town of Davie as additional insured under such Contract of Insurance.

23. **POWER OF ATTORNEY**

23.1 Attorneys-in-Fact who sign Contract Bonds must file with each Bond a certified copy of their Power of Attorney dated the same or subsequent to the Contract.

24. **AWARD OF CONTRACT**

24.1 The Contract, if awarded, will be awarded to the lowest responsive and responsible Bidder. Such a Bidder shall possess the skill, ability, and integrity necessary for the faithful performance of the work. The term “lowest responsible and responsive Bidders” as used herein shall mean the Bidder whose bid is the lowest of those Bidders possessing the skill, ability and integrity necessary for the faithful performance of the work.

25. **ACCEPTANCE PERIOD**

25.1 The Bidder shall hold his or her Bid good for acceptance by the Owner for a period of not less than ninety (90) calendar days following the date of the Bid opening. The Bid guarantee required herein above shall be effective for this period.

26. **DISCRIMINATION**

26.1 An entity or affiliate who has been placed on the discriminatory vendor list may not submit a Bid on a Contract to provide goods and services to a public entity, may not submit a Bid on a Contract with a public entity for the construction or repair of a building or public work, may not submit Bids on leases of real property to a public entity, may not award or perform work as a contractor, supplier, subcontractor or consultant under any Contract with any public entity, and may not transact business with any public entity.
27. **PUBLIC ENTITY CRIMES INFORMATION**

27.1 A person or affiliate who has been placed on the convicted vendor list following a conviction for 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 to provide any goods or services to a public entity, may not submit a Bid with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor or a consultant under a Contract with any public entity, any may not transact business with any public entity provided in Section 287.0171, for CATEGORY TWO, for a period of thirty-six (36) months from the date of being placed on the convicted vendor list.

28. **PERMITS**

28.1 All City of Hollywood permit fees and other required governmental permits shall be requested, processed, and paid for by the Contractor as listed on itemized bid form. Construction working hours in the Town of Davie are Monday through Friday 7 AM to 7 PM. If contractor elects to work outside of these hours, contractor must request permission from the Town of Davie and pay any additional fees required per department fee schedules.

29. **INDEMNIFICATION AND HOLD HARMLESS**

29.1 The Contractor agrees to indemnify and hold harmless the Town, its officers, agents and employees, free and harmless from any claim, liability, cause of action, expense or charge, of whatever kind or nature, including, but not limited to, personal injury, loss of life, property damage including loss of use thereof, and against loss of life, which may arise out of or be connected with the performance of contractor's duty hereunder, and shall indemnify the Town against any suits, actions, claims, damages, or causes of action brought by or on behalf of any person arising out of the performance of such duties, and pay all costs and expenses in connection therewith. Nothing in this agreement shall be construed to affect in any way the Town's rights, privileges, and immunities as set forth in Florida Statutes 768.28.

30. **TERMINATION OF CONTRACT**

30.1 It is agreed that should the Contractor fail, in the sole discretion of the Town, in keeping and performing any and all terms and conditions of the contract, the contract may be canceled upon written notification.

31. **LIQUIDATED DAMAGES**

31.1 The Town shall assess a five hundred dollars ($500) per day liquidated damage cost for every day the project exceeds the contract allotted time. These costs will be levied in all cases but for those approved extensions by the Town or due to extreme Acts of God. Liquidated damages will be levied for each day after the designated Time of Completion, Sundays and Holidays included, that the work remains incomplete. This sum shall represent the actual damages which the Owner will have sustained per day by failure of the Contractor to complete the work within the time stipulated, and this sum is not a penalty, being the liquidated damages the Owner will have sustained in the event of such default by the Contractor.
32. **PAYMENT**

32.1 Payment shall be in accordance with the Florida Prompt Payment Act. Progress payments may be invoiced one time per month, maximum. A 10% retainage will be withheld until final acceptance by the Town of Davie has been obtained, the required final inspections have been approved, the “As Built” drawings have been received, and Final Releases of Lien have been received by the Town of Davie for all materials suppliers and subcontractors. The bidder may choose to accept payment from the Town of Davie credit card. This type of payment can be made immediately after acceptance by the Town of Davie.

33. **WARRANTY**

33.1 The Contractor shall warranty to the Owner that all materials and equipment furnished under the contract by the General Contractor or his/her subcontractor will be of good quality and new, and that the Work shall be free from defects not inherent in the quality, required or permitted, and that the Work shall conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, will be considered defective. Any defective work must be repaired or replaced by the Contractor at no expense to the Owner for a period of one year after acceptance. The Contractor’s warranty excludes remedy for damage caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage.

34. **“AS BUILT” RECORD DOCUMENTS**

34.1 The Contractor shall supply the Owner with one (1) set of “As Built” record drawings, three (3) sets of signed and sealed drawings, and a CD with the electronic CAD drawings in State Plane Coordinates NAD 1983 with the 1990 Adjustment, if applicable, indicating the final installation of the Site’s, concrete, plumbing, electrical, structural, and all other systems, as well as drainage inverts, outfall and elevations, roadway rock and driveway connection elevations, including all modifications made due to field conditions, change orders, et cetera. Surveying and layout expenses are the responsibility of the Bidder.

35. **RESTRICTIONS TO PUBLIC ACCESS TO PROJECT PLANS**

35.1 The Contractor shall be advised that public access to project plans is now restricted, and plans are no longer subject to public records requests, as per Florida Status F.S.119.07(3)(ee) which states:

“(ee) Building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary and final formats, which depict the internal layout and structural elements of a building, arena, stadium, water treatment facility, or other structure owned or operated by an agency as defined in s.119.011 are exempt from the provisions of subsection (1) and s. 24(a), Art. 1 of the State Constitution. This exemption applies to building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a building, arena, stadium, water treatment facility, or owned or operated by an agency before, on, or after the effective date of this act. Information made exempt by this paragraph may be disclosed to another governmental entity if disclosure is necessary for the receiving entity to perform its duties.
and responsibilities, to a licensed Engineer or contractor who is performing work on or related to the building, arena, stadium, water treatment facility, or other structure owned or operated by an agency; or upon showing of good cause before a court of competent jurisdiction. The entities or persons receiving such information shall maintain the exempt status of the information. This paragraph is subject to the Open Government Sunset Review Act of 1995 in accordance with s. 119.15, and shall stand repealed on October 2, 2007, unless reviewed and re-enacted by the Legislature.”

36. CODE COMPLIANCE


END OF DOCUMENT
This Bid is submitted to: Town Council, Davie, Florida.

1. The undersigned, as Bidder, hereby declares that he/she is acquainted with the site of the construction as shown on the drawings and specifications and has fully acquainted himself/herself with the work to be done; that he/she has thoroughly examined the drawings, Specifications and all Contract Documents pertaining thereto; and has read any and all addenda issued prior to the opening of Bids; all as designed under the Engineer's Bid Number B-17-156.

2. The Bidder proposes and agrees, if this Bid is accepted, to secure all required permits, furnish all necessary materials, tools, construction equipment, all necessary transportation and labor to complete the construction as shown, detailed and described in the Specifications and on the drawings.

3. It is understood by the Bidder that the quantities in the following quotation form are given for the purpose of the Bid comparison only.

4. It is understood by the Bidder that all Bid item amounts shall be submitted. In the event any item is not included, rejection of the Bid will be considered by the Owner.

5. It is understood that certain portions of the Bid section may be deleted from the awarded Contract at the Owner’s discretion.

6. The Bidder acknowledges that, included in the various items of the Bid and in the total Bid price, are costs for complying with the Florida Trench Act of 1990.

7. The Bidder agrees that, if awarded the Contract, he/she will sign the Contract Documents within seven (7) calendar days of the Notice of Award; that he/she will commence the work on the date stated in the Notice to Proceed; and that he/she will have the work fully completed for Owner’s use within 180 calendar days. If not, liquidated damages will be assessed at the rate of five hundred dollars ($500) per calendar day, Sundays and holidays included.

8. The Bidder is licensed as a Contractor to perform the work or services contemplated by this Bid and holds License No. ________________ issued by __________________, Florida.
The Bidder further proposes that the following subcontracting firms or businesses will be awarded subcontracts for the following portions of the work in the event the Bidder is awarded the Contract:

1. 
   (Portion of Work)  
   (Name of Subcontractor)  (Telephone #)  
   (Street)  (City)  (State)  (Zip)

2. 
   (Portion of Work)  
   (Name of Subcontractor)  (Telephone #)  
   (Street)  (City)  (State)  (Zip)

3. 
   (Portion of Work)  
   (Name of Subcontractor)  (Telephone #)  
   (Street)  (City)  (State)  (Zip)

4. 
   (Portion of Work)  
   (Name of Subcontractor)  (Telephone #)  
   (Street)  (City)  (State)  (Zip)

5. 
   (Portion of Work)  
   (Name of Subcontractor)  (Telephone #)  
   (Street)  (City)  (State)  (Zip)
(Sign below if Incorporated)

ATTEST: __________________________

(Name of Corporation)

________________________________

(Secretary)

________________________________

(Signature and Title)

(CORPORATE SEAL)

________________________________

(Type Name and Title signed above)

Incorporated under the laws of the State of ________________.
BID FORM:

IF BIDDER IS:

1. An Individual

By: ________________________________ (SEAL)

(Individual's Name)

Doing business as: ________________________________

Business Address: ________________________________

Phone: ________________________________

2. A Partnership

By: ________________________________ (SEAL)

(Firm's Name)

______________________________ (General Partner)

Business Address: ________________________________

Phone: ________________________________

By: ________________________________ (SEAL)

(Individual's Name)

3. A Corporation

By: ________________________________

(Corporation Name)

______________________________ (State of Incorporation)

By: ________________________________

(Name of Person Authorized to Sign)

______________________________ (Title)

Phone: ________________________________ (Corporate Seal)

Attest: ________________________________

(Secretary)

Business Address: ________________________________

Phone: ________________________________
4. A Joint Venture

By: __________________________________________
   (Name)
   __________________________________________
   (Address)

By: __________________________________________
   (Name)
   __________________________________________
   (Address)

(Each joint venture must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above.)
### Bid Form
Lift Station No. 9 Rehabilitation
Bid No. B-17-156

<table>
<thead>
<tr>
<th>Bid Item</th>
<th>Description</th>
<th>Estimated Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General Requirements</td>
<td>1</td>
<td>LS</td>
<td>$</td>
</tr>
<tr>
<td>2</td>
<td>Mobilization/Demobilization</td>
<td>1</td>
<td>LS</td>
<td>$</td>
</tr>
<tr>
<td>3</td>
<td>Maintenance of Traffic</td>
<td>1</td>
<td>LS</td>
<td>$</td>
</tr>
<tr>
<td>4</td>
<td>Demolition</td>
<td>1</td>
<td>LS</td>
<td>$</td>
</tr>
<tr>
<td>5</td>
<td>Pumps and Motors</td>
<td>1</td>
<td>LS</td>
<td>$</td>
</tr>
<tr>
<td>6</td>
<td>Electrical and Instrumentation</td>
<td>1</td>
<td>LS</td>
<td>$</td>
</tr>
<tr>
<td>7</td>
<td>Mechanical</td>
<td>1</td>
<td>LS</td>
<td>$</td>
</tr>
<tr>
<td>8</td>
<td>Permitting Allowance</td>
<td>1</td>
<td>AL</td>
<td>$15,000.00</td>
</tr>
</tbody>
</table>

**Total Contract Amount**

$=

**TOTAL CONTRACT AMOUNT IN WORDS**

The lowest Bid shall be determined by the Total Contract Amount
Bid Submitted by:

Name: ___________________________ Date: ______________

Company: _____________________________________________________________________

Address: _____________________________________________________________________

Phone: _______________________________________________________________________

Fax: _________________________________________________________________________

Email Address: ________________________________________________________________

Signature: ____________________________________________________________________

Print Name: __________________________________________________________________

Print Title: ___________________________________________________________________
Bid Form

Acknowledgement of Addenda

Bidding Contractor shall indicate receipt of addendum by initialing below for each addendum received.

Addendum #1 ________________  Addendum #2 ________________

Addendum #3 ________________  Addendum #4 ________________
CONTRACTOR AFFIDAVIT

General Contractor must acknowledge via letter of transmittal that they have reviewed the entire Contract Documents and will provide all “NAMED PRODUCTS” or approved substitutions per Document 00100, and in the event there is ambiguity or conflict relating to items or arrangements to be furnished under the Contract Documents, the Engineer will determine which takes precedence. It is understood that the Contractor shall furnish the items or arrangements of greater quantity, better quality, or higher cost as conclusively determined by the Engineer.

In addition, the General Contractor has reviewed this condition with all the Subcontractors and Suppliers.

General Contractor

_______________________________________________________________________
Signature Title

_______________________________________________________________________
Company Name
TOWN OF DAVIE

Lift Station No. 9 Rehabilitation

QUALIFICATION REQUESTS

Contractor to list projects fulfilling the following qualification requests:

Contractor must list projects where the following building components and/or building systems were utilized under their direct supervision and General Contractor License:

1. Projects involving pump station rehabilitation experience

2. List Project Management Personnel, include resumes. Personnel cannot be changed without written approval.
   * Principal in charge
   * Project Manager
   * Superintendent

3. List minimum of five (5) previous public Bid projects
   List Owner’s representative and phone number.

Omission of any of the above items in the Project List will disqualify Bid!
## PROJECT LIST

Completed Construction Projects that satisfy qualification requirements:

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Owner or Representative</th>
<th>Phone Number</th>
<th>Engineer</th>
<th>Contract Amount</th>
<th>Date Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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</table>
Town of Davie Vendor/Bidder Disclosure

I, ____________________, being first duly sworn state that:
The full legal name and business address of the person(s) or entity contracting with the Town of Davie (“Town”) are as follows (Post Office addresses are not acceptable):

Name of Individual, Firm, or Organization: ______________________________________________________

Address: ______________________________________________________

____________________________________________________

FEIN: ________________________________________________________________________________

State and Date of Incorporation: _______________________________________________________________

OWNERSHIP DISCLOSURE AFFIDAVIT

1. If the contract or business transaction is with a corporation, the full legal Name and Business address shall be provided for each officer and director and each stakeholder who directly or indirectly holds five percent (5%) or more of the corporation’s stock. If the contract or business transaction is with a trust, the full name and address shall be provided for each trustee and each beneficiary. All such names and addresses are as follows: (Post Office addresses are not acceptable):

Full Legal Name Address Ownership

___________________________________________________________________________________ %

___________________________________________________________________________________ %

___________________________________________________________________________________ %

___________________________________________________________________________________ %
2. The full legal names and business addresses of any other individual (other than subcontractors, material men, suppliers, laborers, and lenders) who have, or will have, any legal, equitable, or beneficial interest in the contract or business transaction with the Town are as follows (Post Office addresses are not acceptable):

<table>
<thead>
<tr>
<th>Full Legal Name</th>
<th>Address</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

By: _________________________ Date: ________________
Signature of Affiant

___________________________
Print Name

SUBSCRIBED AND SWORN TO or affirmed before me this _______ day of ___________________ 2017, by ________________________________, he/she is personally known to me or has presented ___________________________ as identification.

___________________________
Notary Public, State of Florida at Large

___________________________
Print or Stamp of Notary

___________________________
Serial Number

My Commission Expires: ___________________
LOCAL VENDOR PREFERENCE

1. Definitions

**Local Davie Vendor** – A “Local Davie Vendor” shall mean a person or business entity which has maintained a permanent place of business with full-time employees within the Town limits for a minimum of six months prior to the date of issuance of a bid or proposal solicitation. The permanent place of business **may not** be a post office box or a residence. The business location must actually distribute goods or services from that location. In addition, the business must have a current business tax receipt from the Town of Davie and have an address that the U.S. Postal Service recognizes as being a Davie address to be eligible.

**Local Broward County Vendor** – A “Local Broward County Vendor” shall mean a person or business entity which has maintained a permanent place of business with full-time employees within the Broward County limits for a minimum of six months prior to the date of issuance of a bid or proposal solicitation. The permanent place of business **may not** be a post office box or a residence. The business location must actually distribute goods or services from that location. In addition, the business must have a current business tax receipt from the Broward County or the city within Broward County where the business resides and have an address that the U.S. Postal Service recognizes as being a Broward County address to be eligible.

**Bid** – A “Bid” shall be any competitive solicitation by specification officially posted by the Town of Davie Purchasing staff on the Town’s website where the award is determined by price.

**Proposal** – A “Proposal” shall be any competitive solicitation by Request for Proposal (RFP) officially posted by the Town of Davie purchasing staff on the Town’s website where the award is determined by qualifications.

2. Process

a) **Competitive Bid** – For bid evaluation purposes, vendors that meet the definition of “Local Davie Vendor” as detailed above shall be given a 5% evaluation credit. This shall mean that if a “Local Davie Vendor” submits a bid/quote that is within 5% of the lowest price submitted by any vendor, the “Local Davie Vendor” shall have an option to submit another bid which is at least 1% lower than the lowest responsive bid/quote. If the “Local Davie Vendor” submits a bid which is at least 1% lower than that lowest responsive bid/quote, then the award will go to the “Local Davie Vendor”. If not, the award will be made to the vendor that submits the lowest responsive bid/quote. If the lowest responsive and responsible bidder **IS** a “Local Davie Vendor”, the award will be made to that vendor and no other bidders will be given an opportunity to submit additional bids as described herein.

For bid evaluation purposes, vendors that meet the definition of “Local Broward County Vendor” as detailed above shall be given a 2.5% evaluation credit. This shall mean that if a “Local Broward County Vendor” submits a bid/quote that is within 2.5% of the lowest price submitted by any vendor, the “Local Broward County Vendor” shall have an option to submit another bid which is at least 1% lower than the lowest responsive bid/quote. If the “Local Broward County Vendor” submits a bid which is at least 1% lower than that lowest responsive bid/quote, then the award will go to the “Local Broward County Vendor”. If not, the award will be made to the vendor that submits the lowest responsive bid/quote.
If the lowest responsive and responsible bidder is a “Local Davie Vendor”, the award will be made to that vendor and no other bidders will be given an opportunity to submit additional bids as described herein.

If there is a “Local Davie Vendor” and a “Local Broward County Vendor” participating in the same bid solicitation and both vendors qualify to submit a second bid as detailed above, the “Local Davie Vendor” will be given first option. If the “Local Davie Vendor” cannot beat the lowest bid received by at least 1%, an opportunity will be given to the “Local Broward County Vendor”. If the “Local Broward County Vendor” cannot beat the lowest bid by at least 1%, then the bid will be awarded to the lowest bidder regardless of geographic location of the business.

If multiple “Local Davie Vendors” submit bids/quotes which are within 5% of the lowest bid/quote, then all vendors will be asked to submit a “Best and Final Offer” (BAFO). The award will be made to the “Local Davie Vendor” submitting the lowest BAFO providing that that BAFO is at least 1% lower than the lowest bid/quote received in the original solicitation. If no “Local Davie Vendor” can beat the lowest bid/quote by at least 1%, then the process will be repeated with all “Local Broward County Vendors” who have submitted a bid/quote which is within 2.5% of the lowest bid/quote. If no “Local Davie Vendor” and no “Local Broward County Vendor” can submit a BAFO that is at least 1% lower than the lowest bid/quote submitted in the original solicitation, the award will be made to the lowest responsive bidder regardless of geographic location of the business.

b) Competitive Proposal- For evaluation purposes, “Local Davie Vendor” and “Local Broward County Vendor” shall be a criterion for award in any Request For Proposal unless specifically exempted by the Town Administrator or the Town Council.

c) Exceptions

1. No “local vendor” preference will be included in any competitive solicitation where the Town is the lead agency for the Southeast Florida Cooperative Purchasing Group.
2. Utilization of a State or other agency contract.
3. State or Federal law prohibits the use of local preference.
4. The work is funded in whole or in part by a governmental entity where the laws, rules, regulations or policies prohibit the use of local preferences.
5. Sole source or single source purchases.
6. The “local vendor” is either non-responsive or non-responsible.
7. All bids submitted exceed the budget amount for the project.
9. The Town Administrator and/or the Town Council may exempt any competitive solicitation from the local vendor preference.
Town of Davie
Local Vendor Preference

Affidavit of Eligibility

Complete all areas below. Incomplete forms may be rejected.

_______ My business is located within the Town of Davie.

LEGAL NAME OF FIRM: ________________________________

Physical address:
____________________________________________________

Phone number ________________ Fax number ________________

Email address __________________________________________

Has the business name changed since it was opened in Davie? Yes _____ No _____

If Yes please provide the previous business name: _______________________________

Taxpayer Identification Number: _____________________________________________

Date your business was established in Town of Davie: _________________________

Business license: License number: ________________ Date issued: ____________

_______ A copy of my Business Tax Receipt is attached.

I employ __________ (insert a number) full time employees.

If your business is a Broward County business but not located within the Town of Davie please fill out the information on the next page.
Town of Davie
Local Vendor Preference
Broward County Vendor

Affidavit of Eligibility

Complete all areas below. Incomplete forms may be rejected.

_______ My business is located within Broward County but not in the Town of Davie.

LEGAL NAME OF FIRM: ____________________________________________________

Physical address:
____________________________________________________________________

Phone number _______________       Fax number _______________

Email address ________________________________________________________

Has the business name changed since it was opened in Broward County?  Yes __   No __

If Yes, please provide the previous business name: _______________________________

Taxpayer Identification Number: _______________________

Date your business was established in Broward County: ___________________________

Business license: License number: _______________       Date issued: ___________

_______ A copy of my Business Tax Receipt is attached.

I employ __________ (insert a number) full time employees.

The undersigned states that the forgoing statements are true and correct. The undersigned also acknowledges that any person, firm, corporation or entity intentionally submitting false information to the Town in an attempt to qualify for local preference shall be prohibited from bidding on Town of Davie products and services for a period of one (1) year.

Authorized Signature: __________________________________   Date: _____________

Printed Name & Title: ______________________________________________________
The Town of Davie has an Exclusive Solid Waste Franchise Agreement with Waste Management Inc. of Florida for the Collection and Disposal of all Solid Waste including Construction and Demolition (C&D) debris as defined within Florida Statutes Chapter 403. All applicants for bids to perform construction work for the Town of Davie shall be subject to the requirements found in the Town's exclusive solid waste franchise agreement and must contract with Waste Management for the collection and disposal of all construction and demolition debris generated at such construction job sites.

For the current applicable rates and fees for Waste Management dumpsters, roll-off containers, and other related solid waste service equipment needs, please contact Kay Hurley, Waste Management's Construction Services Account Manager, at (954) 439-4067 or khurley@wm.com.

For further information related to bid specifications related to solid waste franchise requirements, please contact Brian K. O'Connor, Procurement Manager, at (954) 797-1016.

For solid waste franchise enforcement questions, please contact the Town of Davie Program Division's representative at 954-797-1045 or Danny Stallone, Code Compliance Official, at (954) 693-8237.

PLEASE BE ADVISED THAT THE FAILURE OF ANY BIDDER FOR A CONSTRUCTION PROJECT FOR THE TOWN OF DAVIE, INCLUDING AND NOT LIMITED TO GENERAL CONTRACTORS AND DEVELOPERS, TO ADHERE TO THE REQUIREMENTS OF THE TOWN'S EXCLUSIVE SOLID WASTE FRANCHISE AGREEMENT SHALL RESULT IN A NOTICE OF VIOLATION, CITATION OR SIMILAR CODE ENFORCEMENT ACTION BEING TAKEN AGAINST THEM. ENFORCEMENT ACTION MAY INCLUDE DENIAL OR REVOCATION OF A BID APPLICATION AND ITS APPROVAL. THE ENFORCEMENT ACTION WILL RESULT IN FINES AND LIENS UP TO $15,000/DAY FOR IRREPARABLE VIOLATIONS, UP TO $1000/DAY FOR FIRST VIOLATIONS, UP TO $5000/DAY FOR REPEAT VIOLATIONS PLUS APPLICABLE COST RECOVERY AND ATTORNEY FEES.
BID SUBMITTAL COMPLETION CONFIRMATION for ITB’s:

______ I, the Bidder, have completed and signed (in blue ink) all required bid document pages.

______ I, the Bidder, have submitted my bid on the bid sheets provided, and acknowledge that bids not submitted on bid sheets provided may be rejected.

______ I, the Bidder, have filled in all spaces on the pricing page as noted, and acknowledged that bids with spaces left blank on the pricing page may be rejected.

______ I, the bidder, have included all information, certificates, licenses, and additional documentation as required by the Town in this bid document.

______ I, the Bidder, have checked for any addendums to this bid, and will continue to check for any addendums up to the due date and time of this bid.

______ I, the Bidder, have included on the face of the envelope, my company name and return address, the date and time of the bid opening, and the bid name and number.

______ I, the Bidder, have submitted one (1) original, two (2) copies and one (1) electronic of the entire bid document and addendums.

______ I, the Bidder, have read and completed the Vendor/Bidder Disclosure Form.

______ I, the Bidder, have read and completed the W-9 Form.

______ I, the Bidder, am aware that a Notice of Intent to Award this bid shall be posted on the Town’s website at www.davie-fl.gov and on the Town Hall bulletin board in the front lobby at Town Hall, and that it is my responsibility to check for this posting.

______ I, the Bidder, have submitted all supporting documentation for local preference eligibility, which must be received with the bid package prior to the bid opening date and time.

______ I, the Bidder, have completed this checklist and it is included with my submittal.

NAME OF COMPANY: ______________________________________________________

BIDDER'S NAME: _________________________________________________________

BIDDER'S AUTHORIZED SIGNATURE: ______________________________________

DATE: _________________________

06/2017   Lift Station No. 9 Rehabilitation   96-1630.120
Document 00300   Page 20 of 32
BID PROTEST PROCEDURE

If a vendor feels that they have been treated unfairly concerning the results of a solicitation, or the resulting recommendation for award, they may protest the Town’s action as follows:

1. The vendor must submit a letter to the Procurement Manager detailing the nature of the protest accompanied by two (2) cashier’s checks within three (3) working days of the Notice of Intent to Award. The first check will be in the amount of $500 (hereinafter called “the administrative fee”). The second check will be in the amount of 1% of the bid amount (hereinafter called “the protest bond”). The Town’s Notices of Intent to Award are posted on the Town of Davie website.

2. If the Procurement Manager receives a bid protest letter, the administrative fee, and the protest bond as described above, the bid award process will be suspended and the protest will be referred to the Bid Protest Committee. However, if the project is needed to protect the health, safety, and/or welfare of the residents of the Town of Davie, the award of the project will proceed without interruption. The Bid Protest Committee shall consist of three (3) Town of Davie staff members selected by the Town Administrator. The Procurement Manager and the employee that wrote the Recommendation for Award may not sit as a member of the Bid Protest Committee. However, the Procurement Manager and the staff member that wrote the Recommendation for Award shall be present at the hearing of the Bid Protest Committee to answer any questions pertaining to the bid process or the evaluation process.

3. The Bid Protest Committee shall schedule a hearing within ten (10) working days from receipt of the protest letter. All parties having an interest in the outcome will be notified of the date and time of the hearing. If the bid protest is denied, the vendor will forfeit the protest bond. If the protest is upheld, the protest bond will be returned to the vendor. The administrative fee shall be non-refundable in all cases.

4. If the Bid Protest Committee denies the protest, the aggrieved vendor may appeal his/her case to the Davie Town Council. In order to appeal, the vendor must notify the Town Administrator within three (3) working days of the Bid Protest Committee’s ruling. Upon notification, the Town Administrator will schedule the appeal as an agenda item on the next available Town Council agenda. All bidders will be notified of the agenda date.

5. Once the bid protest is resolved, the Town will proceed with the bid award, except as exempted in 2, above.
CONFIRMATION OF DRUG-FREE WORKPLACE

In order to have a drug-free workplace program, a business shall:

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

Inform employees about the dangers of drug abuse in the workplace, the business'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.

Give each employee engaged in providing the commodities or Contractual services that are under Bid a copy of the statement specified in subsection (1).

In the statement specified in subsection (1), notify the employee that, as a condition of working on 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 or nolo contenders 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 the conviction.

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 so convicted.

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

A signed copy of your Drug-Free Workplace Policy must be attached to this signed copy and submitted with the Bid Documents.

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

___________________________________________

Proposers Signature
EMPLOYEE BACKGROUND VERIFICATION AFFIDAVIT

I, __________________________, Company_________________________,

Attest that all personnel used in the performance of this work have had a criminal background check, and have no criminal offenses, a negative drug test result, and are legally documented to work in the United States.

The Town of Davie requests copies of the criminal background checks and drug test results.

Proposer’s Signature____________________________________________
LOBBYING INTEREST

Respondents should refer to Sec. 2-57 of the attached form for complete definition of terms.

I, _______________________ representing ______________________________ declare that I have read the attached form and that (check one):

_____ My company is not interested in lobbying either staff or elected officials on any subject associated with this solicitation

_____ My company is interested in lobbying either staff or elected officials on matters associated with this solicitation. I understand that in order to lobby, I must fill out the attached form and submit it to the Town Clerk’s Office along with a registration fee of $50.00.

Title of Bid: _______________________________________________________

Bidder Name: _____________________________________________________

Address: _________________________________________________________

_________________________________________________________________

Phone Number: ____________________________________________________

Fax Number: ______________________________________________________

e-mail Address: ___________________________________________________

Signature: _________________________________________________________

Print Name: _______________________________________________________
TOWN OF DAVIE LOBBYIST’S REGISTRATION STATEMENT AND OATH

Registration will be annual, from October 1st to September 30th, and shall be renewed for each year during which lobbying activities are to take place. Only one annual registration form is required. If, however, any of the information required on the registration form is new or changed (for example, a new principal, as defined by Section 2-57 of Ordinance 2012-17, or a new specific subject of lobbying), the Lobbyist must then supplement or amend the registration before additional lobbying. (Ordinance 2012-17, Section 2-58(d))

LOBBYIST INFORMATION (Ordinance 2012-17, Section 2-58(a)(l))

Name _______________________________
Address ______________________________

{must be a physical address (e.g. not a Post Office Box) where the lobbyist resides or customarily does business)

City______________________ State____________ Zip ________ Telephone _____________

Explain the nature and extent of any business, professional or familial relationship which the lobbyist, or any member of the lobbyist’s immediate family, has had with any Town official, or member of the immediate family of any Town official within the period of time commencing twenty-four (24) months prior to registration.

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Explain the nature and extent of any involvement, activity or assistance, whether paid or voluntary, by any lobbyist, or any member of the lobbyist’s immediate family, with the current or the most recent campaign of any current elected Town official, or current candidate for Town Council. (2012-017, Section 2-58(a)(3))

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
LOBBYIST'S PRINCIPAL(S) INFORMATION (Ordinance 2012-17, Section 2-58(a)(4))

Name _________________________________________________________

Address _______________________________________________________________________
(must be a physical address (e.g. not a Post Office Box) where the principal resides or customarily does business)

City _________________ State _________________ Zip ______ Telephone _________________

Explain the general and specific matters upon which the lobbyist intends to lobby, if known at the time of registration. If not known at time of filing, the registration must be supplemented when the matter is determined. (Ordinance 2012-017, Section 2-58(a)(5))

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

I hereby acknowledge that I have received a copy of Ordinance 2012-17, concerning registration of lobbyists and acknowledge that any violation of this Ordinance shall result in penalties as stated in said Ordinance. I further acknowledge that this form must be accompanied by payment in the amount of $50 for each principal represented and by each lobbyist. (Ordinance 2012-17, Section 2-58(b))

I hereby attest and affirm under penalty of perjury, that the facts contained herein are true and correct. Further, I understand that I am required to notify the Town Clerk, in writing, of any changes to the information contained herein and that I am required to complete a lobbyist statement for each new principal or subject matter which occurs throughout the year.

Signature of Lobbyist ____________________________________________________________

STATE OF FLORIDA
COUNTY OF )

Sworn to and subscribed before me this _________________ day of _______ 20___ by _______________________, who is personally known to me or who has produced _______________________, as identification.

My Commission expires _________________

Name _____________________ Signature________________________
SOLICITATION, GIVING, AND ACCEPTANCE OF GIFTS POLICY

Florida Statute 112.313 prohibits the solicitation or acceptance of Gifts. - “No Public officer, employee of an agency, or candidate for nomination or election shall solicit or accept anything of value to the recipient, including a gift, loan, reward, promise of future employment, favor, or service, based upon any understanding that the vote, official action, or judgment of the public officer, employee, or candidate would be influenced thereby.” The term ‘public officer’ includes any person elected or appointed to hold office in any agency, including any person serving on an advisory body.

The Town of Davie policy prohibits all public officers, elected or appointed, all employees, and their families from accepting any gifts of any value, either directly or indirectly, from any contractor, vendor, consultant, or business with whom the Town does business. Only advertising office stationery or supplies of small value are exempt from this policy - e.g. calendars, note pads, pencils.

The State of Florida definition of “gifts” includes the following:

- Real property or its use,
- Tangible or intangible personal property, or its use,
- A preferential rate of terms on a debt, loan, goods, or services,
- Forgiveness of indebtedness,
- Transportation, lodging, or parking,
- Membership dues,
- Entrance fees, admission fees, or tickets to events, performances, or facilities,
- Plants, flowers or floral arrangements

Services provided by persons pursuant to a professional license or certificate. Other personal services for which a fee is normally charged by the person providing the services. Any other similar service or thing having an attributable value not already provided for in this section. To this list, the Town of Davie has added food, meals, beverages, and candy.

Any contractor, vendor, consultant, or business found to have given a gift to a public officer or employee, or his/her family, will be subject to dismissal or revocation of contract.

As the person authorized to sign the statement, I certify that this firm will comply fully with this policy.

_________________________   ______________________________
SIGNATURE                                                    PRINTED NAME

_________________________   ______________________________
NAME OF COMPANY                                            TITLE

Failure to sign this page shall render your bid non-responsive
INDEMNIFICATION CLAUSE

The Contractor shall indemnify, defend and hold harmless the Town Council, the Town of Davie and their agents and employees from and against all claims, damages, losses and expenses (including attorney's fees) arising out of or resulting from the contractor's performance of the work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or damage on destruction of property including the loss of use resulting therefrom, and (2) is caused in whole or in part by any breach or default by Contractor or negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them 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.

_________________________   _______________________   ________________
Proposer's Name     Signature         Date

STATE OF FLORIDA
COUNTY OF BROWARD

SWORN TO AND SUBSCRIBED before me, the undersigned authority,

[signature of individual signing] who, after first being sworn by me, affixed his/her
signature in the space provided above on this _____ day of _____________, 20_____

________________________________________
NOTARY PUBLIC
1. This sworn statement is submitted to the **TOWN OF DAVIE, FLORIDA**

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 misrepresentations.

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 a jury verdict, non-jury trial, or entry of a plea of guilty or non 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) (e), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with 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, and 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 relations to the entity submitting this sworn statement. (Indicate which statement applies).

□ Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the 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 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.

□ 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 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

Sworn to and subscribed before me this _________ day ______________________, 20____

Personally known ________________________ ____________________________________
OR _______________________________________ Name of Notary
Produced identification _______________________ Notary Public – State of ______________
ANTI-KICKBACK AFFIDAVIT

STATE OF FLORIDA  }  SS:
COUNTY OF  }

I, the undersigned, hereby duly sworn, depose and say that no portion of the sum herein bid will be paid to any employees of the Town of Davie, its elected officials, and ______________________ or its design consultants, as a commission, kickback, reward or gift, directly or indirectly by me or any member of my firm or by an officer of the corporation.

By: __________________________
Title: __________________________

Sworn and subscribed before this
____ day of ____________, 20__

________________________________________
Notary Public, State of Florida

________________________________________
(Printed Name)

My commission expires: ______________________
BID BOND

BIDDER (Name, Address and Phone No.):


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


OWNER (Name and Address and Phone No.):

TOWN OF DAVIE

6591 Orange Drive

Davie, Florida 33314

Phone (954) 797-1030

BID

BID DUE DATE:
PROJECT

All permits, fees, work, tools, equipment, and materials required for Lift Station No. 9 Rehabilitation shall be provided by the Contractor. The Contractor shall provide a lump sum bid for all work for Town of Davie Lift Station No. 9 Rehabilitation located at 2891 N. 73rd Avenue, Hollywood, Florida.
BOND

BOND NUMBER: ____________________________
DATE: (Not later than Bid due date): _________________
PENAL SUM: 5% of Bid amount __________________________

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound, hereby subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent or representative.

BIDDER

__________________________________
Bidder’s Name and Corporate Seal

By: ________________________________
Signature and Title

SURETY

__________________________________
Surety’s Name and Corporate Seal

By: ________________________________
Signature and Title

(Attach Power of Attorney)

Attest: ______________________________
Signature and Title

Attest: ______________________________
Signature and Title

Note: (1) Above addresses are to be used for giving required notice.
(2) Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns, to pay to Owner upon default of Bidder, the difference between the total amount of Bidder’s Bid and the total amount of the Bid of the next lowest, responsible and responsive bidder as determined by Owner for the work required by the Contract Documents, provided that

   1.1. If there is no such next lowest, responsible and responsive bidder, and Owner does not abandon the project, then Bidder and Surety shall pay to Owner the penal sum set forth on the face of this Bond, and

   1.2. In no event shall Bidder’s and Surety’s obligation hereunder exceed the penal sum set forth on the face of this Bond.

2. Default of Bidder shall occur upon the failure of Bidder to deliver, within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner), the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents.
3. This obligation shall be null and void if:

3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents, (or any extension thereof agreed to in writing by Owner), the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents, or

3.2. All bids are rejected by Owner, or

3.3. Owner fails to issue a notice of award to Bidder within the time specified in the Bidding Documents, (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default by Bidder and within thirty (30) calendar days after receipt by Bidder and within thirty (30) calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project, and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue notice of award agreed to in writing by Owner and Bidder, provided that the total time for issuing notice of award including extensions, shall not, in the aggregate, exceed 120 days from Bid Due Date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to thirty (30) calendar days, after the Notice of Default required in paragraph 4 above is received by Bidder and Surety, and in no case later than one (1) year after Bid Due Date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state and county in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.

10. The Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable provision of any applicable statute, then the provision of said statute shall govern, and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term “Bid” as used herein includes a bid, offer, or proposal as applicable.

END OF DOCUMENT
TRENCH SAFETY FORM

This form must be completed and signed by the Bidder. Failure to complete this form may result in the Bid being declared non-responsive.

Bidder acknowledges that the Florida Trench Safety Act, Section 553.60 et seq., which became effective October 1, 1990, shall be in effect during the period of construction of the project. The Bidder, by signing and submitting the Bid, assures that the Bidder will perform trench excavations in accordance with applicable trench safety standards. The Bidder further identifies the following separate item of cost of compliance with the applicable trench safety standards, as well as the method of compliance:

Method of Compliance

________________________________________________________________________

________________________________________________________________________

Amount

Total $_____________________

Bidder acknowledges that this amount is included in the applicable items of the proposal and in the grand total bid price. Failure to complete the above will result in the Bid being declared non-responsive.

The Bidder is, and the Owner and Engineer are not, responsible to review and assess all safety precautions, programs and costs, and the means, methods, techniques or technique adequacy, reasonableness of cost, sequences and procedures of any safety precaution, including, but not limited to, compliance with any and all requirements of Florida Statute Section 553.60 et seq., cited as the “Trench Safety Act. Bidder “, and is responsible to determine any safety or safety related standards that apply to the Project.

Witness Signature

Witness Printed Name

Witness Address

Date

Bidder Signature

Bidder Printed Name

Title

Date

END OF DOCUMENT
DOCUMENT 00480

BIDDER'S QUALIFICATION FORM

The undersigned guarantees the truth and accuracy of all statements and answers herein contained.

1. How many years has your organization been in business as a General Contractor?

2. List five projects successfully performed for a public entity.
   1). Project Name: __________________  Owner: ____________________________
      Project Address: __________________________
      Contact: ______________________  Phone: ____________________________
      Contract Amount: ____________ Date of Completion: ________________
      Description of Work: ________________________________

   2). Project Name: _________________  Owner: ____________________________
      Project Address: __________________________
      Contact: ______________________  Phone: ____________________________
      Contract Amount: ____________ Date of Completion: ________________
      Description of Work: ________________________________

   3). Project Name: _________________  Owner: ____________________________
      Project Address: __________________________
      Contact: ______________________  Phone: ____________________________
      Contract Amount: ____________ Date of Completion: ________________
      Description of Work: ________________________________

   4). Project Name: _________________  Owner: ____________________________
      Project Address: __________________________
      Contact: ______________________  Phone: ____________________________
      Contract Amount: ____________ Date of Completion: ________________
      Description of Work: ________________________________

   5). Project Name: _________________  Owner: ____________________________
      Project Address: __________________________
      Contact: ______________________  Phone: ____________________________
      Contract Amount: ____________ Date of Completion: ________________
      Description of Work: ________________________________

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:

________________________________________________________________________

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

<table>
<thead>
<tr>
<th>NAME OF PROJECT</th>
<th>OWNER</th>
<th>TOTAL CONTRACT VALUE</th>
<th>CONTRACTED DATE OF COMPLETION</th>
<th>PERCENTAGE COMPLETION TO DATE</th>
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</table>

(Continue list on insert sheet, if necessary.)

6. Have you personally inspected the proposed work, and have you a complete plan for its performance?

________________________________________________________________________

7. Will you sublet any part of this work? If so, give details such as the subcontractor name, address, phone number and type of work to be performed. Also, indicate the percentage of the total work to be performed by the subcontractor.

________________________________________________________________________

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

________________________________________________________________________

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

________________________________________________________________________
10. What equipment will you rent for the proposed work?

__________________________________________________________________________

__________________________________________________________________________

11. The following is given as a summary of the Financial Statement of the undersigned: (List assets and liabilities, and use insert sheet if necessary.)

__________________________________________________________________________

__________________________________________________________________________

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 name of all the partners. If a trade name, state the names of the individuals who do business under the trade name. It is absolutely necessary that this information be furnished.)

____________________________________
Correct Name of Bidder

(a) The business is a (sole proprietorship) (partnership) (corporation)

__________________________________________________________________________

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

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

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

__________________________________________________________________________

__________________________________________________________________________

Bidder

END OF DOCUMENT
THIS AGREEMENT, made and entered into on the _______ __ day of __________________, 2017, by and between the Town of Davie, Florida, hereinafter called the Owner, and ________________________________, hereinafter called the Contractor.

WITNESSETH:

1. That the Contractor, for the consideration hereafter fully set out, hereby agree with the Owner as follows:

That the Contractor shall furnish all the materials, equipment and labor to perform all the work necessary to complete the Lift Station No. 9 Rehabilitation for the Town of Davie, Florida, all in full and complete accordance with the following Specifications and Contract Documents, which are attached hereto and made a part thereof, as if fully contained herein; Advertisement for Bids; Instructions to Bidders; General Conditions, Supplementary Conditions, Addenda, Construction Drawings and Specifications; the Proposal and acceptance thereof.

2. That the Contractor shall commence the work performed under this Agreement on the date specified in the Notice to Proceed order from the Owner and shall fully complete all work within 180 calendar days from said date.

3. That the Owner hereby agrees to pay the Contractor for the faithful performance of this Agreement, subject to additions and deductions as provided in the Specifications or Proposal, in lawful money of the United States, the amount of ________________________ Dollars ($________________) based on the estimate quantities and unit or lump sum prices contained herein.

4. That the Owner, within thirty (30) days from the day an Engineer's approved Application for Payment is presented to he/she, pay the Contractor the amount approved by the Engineer.

5. Partial payment shall be made on the basis or work performed during the preceding calendar month, less ten percent (10%) of the amount of such estimate, which is to be retained by the Owner until all work within a particular part has performed strictly within accordance with this Agreement and until such work has been accepted by the Owner.

6. That upon submission by the Contractor of evidence satisfactory to the Owner that all payrolls, material bills, and other costs incurred by the Contractor in connection with the construction of the work have been paid in full, final payment on account of this Agreement shall be made within thirty (30) days after the completion by the Contractor of all work covered by this Agreement and the acceptance of such work by the Owner.

7. It is mutually agreed between the parties hereto that time is of the essence of this Contract, and in the event the construction of the work is not completed within the time herein specified, it is agreed that from the compensation otherwise to be paid to the Contractor, the Owner may retain the sum of five hundred dollars ($500) per calendar day for each day thereafter, Sundays and Holidays included, that the work remains uncompleted, which sum shall represent the actual damages which the Owner will have sustained per day by the failure of the Contractor to complete the work within the time stipulated,
and this sum is not a penalty, being the liquidated damages the Owner will have sustained in the event of such default by the Contractor.

8. No additional work or extras shall be performed unless the same shall be duly authorized by appropriate action of the Owner in writing.

9. That in the event either party brings suit for enforcement of disagreement, the prevailing party shall be entitled to reasonable attorney’s fees and court costs in addition to any other remedy afforded by law. The Contractor shall guarantee the complete project against poor workmanship and faulty materials for a period of twelve (12) months after final payment and shall within seven (7) days correct any defects which may appear during this period upon notification by the Owner or the Engineer. The venue for any legal action shall be in Broward County, Florida.

10. The making and acceptance of the final payment shall constitute a waiver of all claims by the Owner other than those arising from unsettled liens, from faulty work appearing within twelve (12) months after final payment, or from requirements of all specifications. It shall also constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

11. The Contractor shall perform all work required by the Contract Documents for the Lift Station No. 9 Rehabilitation, Bid No. B-17-156.

12. The Contractor may requisition payments for work completed during the project at monthly intervals. The Contractor’s requisition shall show a complete breakdown of the project components, the quantities completed and the amount due, together with such supporting evidence as may be required by the Engineer. Each requisition shall be submitted in quintuplet (5) to the Engineer for approval. Ten percent (10%) of all monies earned by the Contractor shall be retained by the Owner until the project is totally completed as specified and accepted.
IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day first written above, in quintuplet (5) counterparts, each of which shall, without proof or accounting for the other counterpart, be deemed an original Contract.

_________________________________________    WITNESS:
CONTRACTOR

_________________________________________
BY

_________________________________________
TITLE

_________________________________________
DATE: __________________________

OWNER
Town of Davie, Florida
Municipal Corporation

EVELYN ROIG    JUDY PAUL
Town Clerk     Mayor

(Seal)

_________________________________________
Richard J. Lemack    APPROVED AS TO FORM AND
Town Administrator    CORRECTNESS:

DATE: __________________________

_________________________________________
John Rayson     Town Attorney, Town of Davie

Council Approved: ____________________ (Date)
Contract Amount: $ ________________

END OF DOCUMENT
CONSTRUCTION PAYMENT BOND

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

CONTRACTOR (Name and Address and Phone No.)

____________________________________

____________________________________

____________________________________

____________________________________

SURETY (Name and Principal Place of Business)

____________________________________

____________________________________

____________________________________

OWNER (Name and Address and Phone No.):

TOWN OF DAVIE
6591 Orange Drive
Davie, Florida 33314
Phone (954) 797-1030

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

Lift Station No. 9 Rehabilitation
BID No.  B-17-156
ADDRESS: 6591 Orange Drive, Davie, FL  33314

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

CONTRACTOR AS PRINCIPAL
Company  (Corporate Seal)  SURETY
Company  (Corporate Seal)

Signature: _________________________  Signature: ___________________________
Name and Title: _________________________  Name and Title: ___________________________

CONTRACTOR AS PRINCIPAL
Company  (Corporate Seal)  Company  (Corporate Seal)

Signature: _________________________  Signature: ___________________________
Name and Title: _________________________  Name and Title: ___________________________
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. 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 to 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 Claims, 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.
   4.2 Claimants who do not have a direct contract with the Contractor:
      4.2.1 Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within ninety (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
      4.2.2 Have either received a rejection in whole or in part from the Contractor, or not received within thirty (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
      4.2.3 Not having been paid within the above thirty (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 forty-five (45) days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2 Pay or arrange for payment of any undisputed amounts.

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

8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing, and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor, and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond and shall have, under this Bond, no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

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

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

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

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

14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy 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 to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include, without limitation, in the terms “labor, materials or equipment” that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, 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.
CONSTRUCTION PERFORMANCE BOND

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

CONTRACTOR (Name and Address and Phone No.)

________________________________________

________________________________________

________________________________________

________________________________________

SURETY (Name and Principal Place of Business)

________________________________________

________________________________________

________________________________________

CONTRACTOR (Name and Address and Phone No.):

TOWN OF DAVIE
6591 Orange Drive
Davie, Florida 33314
Phone (954) 797-1030

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

Lift Station No. 9 Rehabilitation

BID No.  B-17-156
ADDRESS:  6591 Orange Drive, Davie, FL  33314

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

CONTRACTOR AS PRINCIPAL  SURETY
Company  (Corporate Seal)  Company  (Corporate Seal)
Signature: _________________________ Signature: ___________________________
Name and Title: 

CONTRACTOR AS PRINCIPAL
Company  (Corporate Seal)  Company  (Corporate Seal)
Signature: _________________________ Signature: ___________________________
Name and Title

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_________ through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, American Institute of Engineers, 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 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 (15) 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 (20) 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:
4.4.1. After investigation, determine the amount for which it may be liable to the Owner and, as soon as deemed practicable by the owner after the amount is determined, tender payment therefor to the Owner; or

4.4.2. Deny liability in whole or in part and notify the Owner citing reasons there for.

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 (15) 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, design, professional and delay costs resulting from the Contractor's Default and resulting from the actions or failure to act of the Surety under Paragraph 4; 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 Contract.

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 Broward County within two (2) years after Contractor Default, or within two (2) years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. The provisions 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.
ACKNOWLEDGEMENT OF CONFORMANCE
WITH O.S.H.A. STANDARDS

TO THE TOWN OF DAVIE:

We, ______________________ hereby acknowledge and agree that as Contractors for Lift Station No. 9 Rehabilitation, within the limits of the City of Hollywood, Florida, have the sole responsibility for compliance with all requirements of the Federal Occupational Safety and Health Act of 1970, and all State and Local Safety and Health Regulations and agree to indemnify and hold harmless the Town of Davie against any and all legal liability or loss the Town or the Engineer may incur due to ______________________________ failure to comply with such act.

________________________________________

ATTEST

________________________________________ By: ______________________________

ATTEST

Title: ______________________________

Date: ______________________________

END OF DOCUMENT
TOWN OF DAVIE
E-VERIFY FORM

Bid No: ________________________________

Project Description: ______________________________________________________________
____________________________________________________________________________________

Vendor/Consultant acknowledges and agrees to utilize the U.S. Department of Homeland Security’s E-Verify System to verify the employment eligibility of:
(a) all persons employed by Vendor/Consultant to perform employment duties within Florida during the term of the contract; and
(b) all persons (including subcontractors/subvendors) assigned by Vendor/Consultant to perform work pursuant to the contract with the Department. The Vendor/Consultant acknowledges and agrees that use of the U.S. Department of Homeland Security’s E-Verify System during the term of the contract is a condition of the contract with the Town of Davie.

Company/Firm: ________________________________________________________________

Authorized Signature: ___________________________________________________________

Print Name ________________________________________________________________

Title: ________________________________________________________________

Date: ________________________________________________________________
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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 Council of Engineering Companies

American Society of Civil Engineers

This document has been approved and endorsed by

The Associated General Contractors of America

Construction Specifications Institute
These General Conditions have been prepared for use with the Suggested Forms of Agreement between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).
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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. Addenda--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. Agreement--The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. Application for Payment--The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. Asbestos--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. Bid--The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. Bidder--The individual or entity who submits a Bid directly to Owner.

7. Bidding Documents--The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. Bidding Requirements--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.

9. Change Order--A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. Claim--A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. Contract--The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. Contract Documents--Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor’s submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. Contract Price--The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. Contract Times--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer’s written recommendation of final payment.

15. Contractor--The individual or entity with whom Owner has entered into the Agreement.


17. Drawings--That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. Effective Date of the Agreement--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. Engineer--The individual or entity named as such in the Agreement.

20. Field Order--A written order issued by Engineer which requires minor changes in the Work but
which does not involve a change in the Contract Price or the Contract Times.

21. General Requirements--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. Hazardous Environmental Condition--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. Hazardous Waste--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. Laws and Regulations; Laws or Regulations--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. Liens--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. Milestone--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. Notice of Award--The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. Notice to Proceed--A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. Owner--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. PCBs--Polychlorinated biphenyls.

31. Petroleum--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. Progress Schedule--A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.

33. Project--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. Project Manual--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. Radioactive Material--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. Related Entity--An officer, director, partner, employee, agent, consultant, or subcontractor.

37. Resident Project Representative--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. Samples--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. Schedule of Submittals--A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. Schedule of Values--A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.

41. Shop Drawings--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. Site--Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. Specifications--That part of the Contract Documents consisting of written requirements for
materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

44. **Subcontractor**--An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

45. **Substantial Completion**--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.

46. **Successful Bidder**--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. **Supplementary Conditions**--That part of the Contract Documents which amends or supplements these General Conditions.

48. **Supplier**--A manufacturer, fabricator, supplier, distributor, material man, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

49. **Underground Facilities**--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or control systems.

50. **Unit Price Work**--Work to be paid for on the basis of unit prices.

51. **Work**--The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. **Work Change Directive**--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

### 1.02 Terminology

A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.

B. **Intent of Certain Terms or Adjectives**

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered”, “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. **Day**

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

D. **Defective**

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
   a. does not conform to the Contract Documents, or
   b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or
c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. Furnish, Install, Perform, Provide

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. Evidence of Insurance: Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 Copies of Documents

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

2.03 Commencement of Contract Times; Notice to Proceed

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

2.04 Starting the Work

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

2.05 Before Starting Construction

A. Preliminary Schedules: Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 Preconstruction Conference

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
2.07 Initial Acceptance of Schedules

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor’s full responsibility therefore.

2. Contractor’s Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor’s Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 Intent

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 Reference Standards

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 Reporting and Resolving Discrepancies

A. Reporting Discrepancies

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

2. Contractor’s Review of Contract Documents During Performance of Work: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.
B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 Amending and Supplementing Contract Documents

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer’s approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer’s written interpretation or clarification.

3.05 Reuse of Documents

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer’s consultants, including electronic media editions; or

2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaption by Engineer.

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

3.06 Electronic Data

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user’s sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data’s creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data’s creator.

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

4.01 Availability of Lands

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner’s furnishing the Site or a part thereof, Contractor may make a Claim therefore as provided in Paragraph 10.05.
B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner’s interest therein as necessary for giving notice of or filing a mechanic’s or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 Subsurface and Physical Conditions

A. Reports and Drawings: The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. Limited Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the general accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 Differing Subsurface or Physical Conditions

A. Notice: If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

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

C. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor’s cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated
contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

1. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefore as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 Underground Facilities

A. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

   a. reviewing and checking all such information and data,

   b. locating all Underground Facilities shown or indicated in the Contract Documents,

   c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and

   d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. Not Shown or Indicated

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefore as provided in Paragraph 10.05.

4.05 Reference Points

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer’s judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 Hazardous Environmental Condition at Site

A. Reports and Drawings: Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous
Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

B. Limited Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the general accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefore as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefore as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner’s own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual’s or entity’s own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual’s or entity’s own negligence.
I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 Performance, Payment, and Other Bonds

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor’s obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the 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 Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent’s authority to act.

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

5.02 Licensed Sureties and Insurers

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

5.03 Certificates of Insurance

A. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

5.04 Contractor’s Liability Insurance

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

1. claims under workers’ compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor’s employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor’s employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

   a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

   b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting there from; and
6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

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

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering Contractor’s indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

5.05 Owner’s Liability Insurance

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

5.06 Property Insurance

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder’s Risk “all-risk” or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to
each other additional insured to whom a certificate of insurance has been issued.

B. 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, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser’s own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 Waiver of Rights

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds there under. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner’s property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. . loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 Receipt and Application of Insurance Proceeds

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of
Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner’s exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 Acceptance of Bonds and Insurance; Option to Replace

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of nonconformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 Partial Utilization, Acknowledgment of Property Insurer

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

ARTICLE 6 - CONTRACTOR’S RESPONSIBILITIES

6.01 Supervision and Superintendence

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor’s representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

6.02 Labor; Working Hours

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

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 Services, Materials, and Equipment

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other...
facilities and incidentals necessary for the performance, testing, startup, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 Progress Schedule

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 Substitutes and “Or-Equals”

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or-equal” item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. “Or-Equal” Items: If in Engineer’s sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an “or-equal” item, in which case review and approval of the proposed item may, in Engineer’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

   a. in the exercise of reasonable judgment Engineer determines that:

      1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

      2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

      3) it has a proven record of performance and availability of responsive service; and

   b. Contractor certifies that, if approved and incorporated into the Work:

      1) there will be no increase in cost to the Owner or increase in Contract Times, and

      2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

   a. If in Engineer’s sole discretion an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

   b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefore. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

   c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

   d. Contractor shall make written application to Engineer for review of a proposed substitute item
of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:
   a) perform adequately the functions and achieve the results called for by the general design,
   b) be similar in substance to that specified, and
   c) be suited to the same use as that specified;
2) will state:
   a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor’s achievement of Substantial Completion on time;
   b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
   c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
3) will identify:
   a) all variations of the proposed substitute item from that specified, and
   b) available engineering, sales, maintenance, repair, and replacement services;
4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer’s sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. Engineer’s Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No “or equal” or substitute will be ordered, installed or utilized until Engineer’s review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an “or equal.” Engineer will advise Contractor in writing of any negative determination.

D. Special Guarantee: Owner may require Contractor to furnish at Contractor’s expense a special performance guarantee or other surety with respect to any substitute.

E. Engineer’s Cost Reimbursement: Engineer will record Engineer’s costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. Contractor’s Expense: Contractor shall provide all data in support of any proposed substitute or “or-equal” at Contractor’s expense.

6.06 Concerning Subcontractors, Suppliers, and Others

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if
Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner’s acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor’s own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 Patent Fees and Royalties

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 Permits

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental
charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09  **Laws and Regulations**

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor’s compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor’s primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor’s obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefore as provided in Paragraph 10.05.

6.10  **Taxes**

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

6.11  **Use of Site and Other Areas**

A. Limitation on Use of Site and Other Areas

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor’s performance of the Work.

B. Removal of Debris During Performance of the Work: During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. Cleaning: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

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

6.12  **Record Documents**

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

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

1. all persons on the Site or who may be affected by the Work;

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

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or , or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

D. Contractor’s duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 Safety Representative

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

6.15 Hazard Communication Programs

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

6.16 Emergencies

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

6.17 Shop Drawings and Samples

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings

   a. Submit number of copies specified in the General Requirements.

   b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. Samples: Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.
a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer’s review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. C. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor’s responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor’s obligations under the Contract Documents with respect to Contractor’s review and approval of that submittal.

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

D. Engineer’s Review

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer’s review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer’s review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer’s review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer’s review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 Continuing the Work

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

6.19 Contractor’s General Warranty and Guarantee

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation
of Contractor’s warranty and guarantee.

B. Contractor’s warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor’s obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor’s obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 Indemnification

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers’ compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer’s officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 Delegation of Professional Design Services

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor’s responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor’s responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional’s written approval when submitted to Engineer.
C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer’s review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer’s review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 Related Work at Site

A. Owner may perform other work related to the Project at the Site with Owner’s employees, or via other direct contracts therefore, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefore as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner’s employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering 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.

C. If the proper execution or results of any part of Contractor’s Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor’s Work. Contractor’s failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor’s Work except for latent defects and deficiencies in such other work.

7.02 Coordination

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 Legal Relationships

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor’s actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor’s action or inactions.
ARTICLE 8 - OWNER’S RESPONSIBILITIES

8.01 Communications to Contractor

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

8.02 Replacement of Engineer

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

8.03 Furnish Data

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

8.04 Pay When Due

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

8.05 Lands and Easements; Reports and Tests

A. Owner’s duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner’s identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.06 Insurance

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

8.07 Change Orders

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

8.08 Inspections, Tests, and Approvals

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

8.09 Limitations on Owner’s Responsibilities

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor’s failure to perform the Work in accordance with the Contract Documents.

8.10 Undisclosed Hazardous Environmental Condition

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

8.11 Evidence of Financial Arrangements

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner’s obligations under the Contract Documents, Owner’s responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER’S STATUS DURING CONSTRUCTION

9.01 Owner’s Representative

A. Engineer will be Owner’s representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner’s representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.02 Visits to Site

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor’s executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer’s efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the
basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer’s visits and observations are subject to all the limitations on Engineer’s authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 Project Representative

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

9.04 Authorized Variations in Work

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefore as provided in Paragraph 10.05.

9.05 Rejecting Defective Work

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

9.06 Shop Drawings, Change Orders and Payments

A. In connection with Engineer’s authority, and limitations thereof, to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer’s authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer’s authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer’s authority as to Applications for Payment, see Article 14.

9.07 Determinations for Unit Price Work

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer’s preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer’s written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 Decisions on Requirements of Contract Documents and Acceptability of Work

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work there under. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer’s decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer’s written decision on the issue
referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 Limitations on Engineer’s Authority and Responsibilities

A. Neither Engineer’s authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

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

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

D. Engineer’s review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 Authorized Changes in the Work

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefore as provided in Paragraph 10.05.

10.02 Unauthorized Changes in the Work

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 Execution of Change Orders

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner’s correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

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

A. 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 Times) 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. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 Claims

A. Engineer’s Decision Required: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. Notice: Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant’s written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant’s last submittal (unless Engineer allows additional time).

C. Engineer’s Action: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,
2. approve the Claim, or
3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer’s sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer’s written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

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

11.01 Cost of the Work

A. Costs Included: The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers’ compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers’ field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor’s Cost of the Work and fee shall be determined in the same manner as Contractor’s Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:
   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor’s employees incurred in discharge of duties connected with the Work.
   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
   c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
   d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.
   e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
   f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor’s fee.
   g. The cost of utilities, fuel, and sanitary facilities at the Site.
   h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.
   i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

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

1. Payroll costs and other compensation of Contractor’s officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor’s principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor’s fee.

2. Expenses of Contractor’s principal and branch offices other than Contractor’s office at the Site.
3. Any part of Contractor’s capital expenses, including interest on Contractor’s capital employed for the Work and charges against Contractor for delinquent payments.

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

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

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

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

11.02 Allowances

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. Cash Allowances

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor’s costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor’s overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.
ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 Change of Contract Price

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor’s fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. Contractor’s Fee: The Contractor’s fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor’s fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor’s fee shall be five percent;

c. where one or more tiers of subcontractors are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor’s fee by an amount equal to five percent of such net decrease; and

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

12.02 Change of Contract Times

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 Delays

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefore as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor’s entitlement to an adjustment of the Contract Times is
conditioned on such adjustment being essential to Contractor’s ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor’s ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor’s sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

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

13.01 Notice of Defects

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

13.02 Access to Work

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor’s Site safety procedures and programs so that they may comply therewith as applicable.

13.03 Tests and Inspections

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner’s and Engineer’s acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor’s purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

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

13.04 Uncovering Work

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer’s observation and replaced at Contractor’s expense.

B. If Engineer considers it necessary or
advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer’s request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefore as provided in Paragraph 10.05.

D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefore as provided in Paragraph 10.05.

13.05 Owner May Stop the Work

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 Correction or Removal of Defective Work

A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

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

13.07 Correction Period

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor’s use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner’s written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting there from.

B. If Contractor does not promptly comply with the terms of Owner’s written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting there from) has been corrected or removed and replaced under this Paragraph 13.07, the correction
period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor’s obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 Acceptance of Defective Work

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer’s recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner’s evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer’s recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefore as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor’s defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner’s rights and remedies under this Paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 Schedule of Values

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

14.02 Progress Payments

A. Applications for Payments

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment
shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner’s interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor’s legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer’s reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer’s recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer’s observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer’s knowledge, information and belief:

a. Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, 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 9.07, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor’s being entitled to such payment appear to have been fulfilled in so far as it is Engineer’s responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer’s review of Contractor’s Work for the purposes of recommending payments nor Engineer’s recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor’s failure to comply with Laws and Regulations applicable to Contractor’s performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer’s opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer’s opinion to protect Owner from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

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

C. Payment Becomes Due

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

D. Reduction in Payment

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
   a. claims have been made against Owner on account of Contractor’s performance or furnishing of the Work;
   b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
   c. there are other items entitling Owner to a set-off against the amount recommended; or
   d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner’s satisfaction the reasons for such action.

3. If it is subsequently determined that Owner’s refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 Contractor’s Warranty of Title

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

14.04 Substantial Completion

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor’s notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefore.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefore. If, after consideration of Owner’s objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer’s issuing the definitive certificate of Substantial Completion, Engineer’s aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 Partial Utilization

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

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefore. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 Final Inspection

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

14.07 Final Payment

A. Application for Payment

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

   b. consent of the surety, if any, to final payment;

   c. a list of all Claims against Owner that Contractor believes are unsettled; and

   d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

   B. Engineer’s Review of Application and Acceptance

1. If, on the basis of Engineer’s observation of the Work during construction and final inspection, and Engineer’s review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor’s other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer’s recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and
Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

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

14.08 Final Completion Delayed

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

14.09 Waiver of Claims

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

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

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

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 Owner May Suspend Work

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefore as provided in Paragraph 10.05.

15.02 Owner May Terminate for Cause

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor’s persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor’s disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor’s disregard of the authority of Engineer; or


B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor’s tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph
ARTICLE 15 - CONTRACT TERMINATION

15.02 Contractor May Stop Work or Terminate

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 Contractor May Stop Work or Terminate

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor’s stopping the Work as permitted by this Paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 Methods and Procedures

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the
Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

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

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim to another dispute resolution process, or

3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 - MISCELLANEOUS

17.01 Giving Notice

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

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 Computation of Times

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

17.03 Cumulative Remedies

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

17.04 Survival of Obligations

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

17.05 Controlling Law

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

17.06 Headings

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.
PART 1 – GENERAL

The General Conditions also may be supplemented elsewhere in the Contract Documents by provisions located in, but not necessarily limited to the Specifications.

In the event of any conflict between these “Supplementary General Conditions” and said “General Conditions”, the more stringent requirements shall govern as determined by the Engineer.

ARTICLE 1: CONTRACT DOCUMENTS

1.1 Miscellaneous Definitions

The term “product” includes materials, systems and equipment.
The term “provide” includes furnishing and installing a product, complete in place, tested and approved.
The term “building code” and the term “code” refer to regulations of governmental agencies having jurisdiction.

1.1.2 The Contract Documents

The Drawings as listed on the cover sheet of the set of drawings shall be a part of the Contract Documents. The Specifications as listed on the Table of Contents of the Specifications Book, shall be a part of the Contract Documents.

1.2 Execution, Correlation and Intent

1.2.1 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

1. The Agreement.
2. Addenda, with those of later date having precedence over those of earlier date.
3. The Supplementary Conditions.
5. Drawings and Specifications.

1.2.2 In the case of an inconsistency between Drawings and Specifications, or within either Document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Engineer’s interpretation.

1.2.3 The Engineer does not assume any responsibility, either direct or implied, for omissions or duplications by the Contractor or Subcontractors due to real or alleged error in the arrangement of matter in the Contract Documents.

1.2.4 Contractor shall check computed dimensions and follow same in preference to scaled dimensions. Computed dimensions shall have precedence over scaled dimensions and large scale drawings over small drawings. Engineering and structural drawings shall take precedence over mechanical, electrical, plumbing and fire protection drawings for
dimensions. All discrepancies shall be reported in writing to the Engineer and verify all field measurements.

1.2.5 In the event that there is ambiguity, conflict or disagreement relating to items or arrangements to be furnished under the Contract Documents, the Engineer will determine which takes precedence. It is understood that the Contractor shall furnish the items or arrangements of greater quantity, better quality, or higher cost as conclusively determined by the Engineer.

1.2.6 For the purposes of all Contract Documents, the word “provide” shall mean that the Contractor shall install, furnish and connect up complete, in operative condition and use, all materials, equipment, apparatus and required appurtenances of the particular item to which it has reference.

1.2.7 Any work included by reference made in any Section to another Section of the Specifications, or is necessary to complete the requirements of the Contract and return all areas affected to a safe and finished condition, shall be included as work under the Contract, whether or not it is called for under the Section referred to. Failure of cross-referencing any item in applicable Sections shall not relieve the Contractor from obligation to furnish and install such items or work.

ARTICLE 2: OWNER

Information and Services Required of the Owner

2.1 The Contractor will be furnished, free of charge, five (5) copies of Drawings and Specifications. Additional sets will be sold to the Contractor at the cost of reproduction, postage and handling.

ARTICLE 3: CONTRACTOR

3.1 Supervision and Construction Procedures

3.1.1 To all applicable sections of the Specifications where preparatory work is part of work thereon, Contractor shall carefully examine surfaces over which his finished work is to be installed, laid or applied, before commencing with his work. Contractor shall report in writing to the Engineer any conditions, which may affect satisfactory execution of his work or endanger its permanency.

3.1.2 Contractor shall not proceed with said work until defective surfaces (as deemed defective by the Engineer) on which work is to be applied are corrected satisfactorily to the Engineer. Commencement of work shall be considered acceptance of surfaces and conditions.

3.1.3 Contractor shall be required to return all areas to a safe, finished, and acceptable condition after work required by the Contract has been completed.

3.2 Labor and Materials

3.2.1 Not later than forty-five (45) days from the Contract Date, the Contractor shall submit all shop drawings, samples and submittals required by the Contract Documents.
3.2.1 Products are generally specified by manufacturer’s name and model or trade name. When specified only by reference standard (such as ASTM number, etc.), the Contractor may select any product meeting this standard by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed. When only one product and manufacturer is specified with the words “or equal”, this is the basis of quality that alternate manufacturers must meet or exceed in performance. If the words “or equal” do not appear with the listed manufacturer, this is the basis of the Contract without substitution or exception. Substitutions shall only be submitted and reviewed within 30 days after award of the Contract. No substitutions shall be submitted during bidding.

3.2.2 After the Contract has been executed, the Owner and the Engineer will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 1 of the Specifications). Any reviews requested for substitutions after execution of the Contract will be performed by the Engineer on an hourly fee basis. An hourly rate of One Hundred Dollars ($100.00) per hour will be charged to the General Contractor.

3.2.3 By making requests for substitutions based on Subparagraph 3.2.2 above, the Contractor:

1. represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
2. represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
3. certifies that the cost data presented is complete and includes all related costs under this Contract, except the Engineer’s redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and
4. will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.

3.2.4 “Or Approved Equal” Clause: Where several items of material manufacturers and fabricators are specified by name for specific use, Contractor may elect for use any of those specified, except as described in Paragraph herein.

Where, in these specifications, names of particular products, manufacturers, materials are specified by a brand or trade name, such has been done to establish required quality and type. **DURING BID PERIOD ONLY**, Bidder may request Engineer to consider another brand or trade name, providing such substitution request is made in writing to Engineer at least ten (10) days prior to the Bid Date. No Addenda listing approved substitutions will be issued later than seven (7) days prior to the date for receipt of Bids. Only such material substitutions will be permitted.

**“NAMED PRODUCTS”** are indicated on plans by use of the manufacturer’s name for a product, including such items as make, model or color, etc. These items appear on finished schedule legend, material details, etc., on these plans. These items take precedence over generic material listed in any Specification Manual. These items are not to be substituted without written approval of the Engineer prior to the Contract Date.
3.2.5 Each Subcontractor shall carefully lay out his/her own work on the job site and verify all field measurements and make required provisions for work of other Subcontractors. Subcontractors are required to insure that all areas affected by their own work are organized, and kept clean at the end of each workday. All trash and residual waste material must be properly discarded so as not to cause litter or unsightly appearances.

3.2.6 Contractor and Subcontractor shall apply, install, connect and erect manufactured items or materials according to recommendations given by the Engineer before proceeding with the work. Contractor shall coordinate work with all related and affected trades responsible for each individual item as required to complete the installation in an acceptable manner.

3.2.7 Workmanship shall be provided to the satisfaction of the Engineer and Owner in the best and most modern available methods and in a workmanlike manner.

3.3 Shop Drawings, Product Data and Samples:

No time extensions will be allowed to the Contractor for re-submittals of shop drawings, product data and samples. If initial submittal of shop drawing is rejected by Engineer, subsequent reviews will be billed on an hourly rate to General Contractor. Funds from Contract Sum will be withheld. Contractor to provide thorough review and checking of all submittals prior to delivery to Engineer. Note that all details and materials are selected and described in plans.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.1 Engineer

4.1.1 The term Engineer refers to:

Calvin, Giordano & Associates
1800 Eller Drive – Suite 600
Ft. Lauderdale, FL 33316

4.2 Engineer’s Administration of the Contract

4.2.1 Change any reference of “approval” to “review” by the Engineer. Review is for general conformance with the design concept and general compliance with the information given in the Contract Documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the project plans and specifications, nor departures therefrom. The Contractor remains responsible for details and accuracy, for confirming and correlating qualities, job conditions, dimensions for gauges, for fabrication processes, for coordination of the work of other trades, for techniques of assembly and construction, and for performing his work in a safe manner.

4.3 Claims for Additional Time

4.3.1 If the Contractor wishes to make claim for an increase in the Contract Time, written notice as provided herein shall be given “within 24 hours of the onset of the delay in order to be considered”.
ARTICLE 5: CHANGES IN THE WORK

5.1 Change Orders

5.1.1 The Contractor may submit a proposal for a change in the work, or the Engineer shall prepare descriptive data, sketches, drawings and other information necessary to describe a proposed change to the work and request a change cost proposal from the Contractor.

5.1.2 The Contractor shall prepare and submit to the Engineer the “Change Cost Proposal”. Such proposal shall include any change in the Contract time which will result from the contemplated change and an itemized detailed breakdown of the cost of the work including, but not limited to, the following:

1. Material quantities and unit prices separated into trades.
2. Labor costs separated into trades.
3. Construction equipment required, except hand tools.
4. Contractor’s contribution to Federal and Florida Unemployment Insurance.
5. Social Security.
6. Overhead.
7. Profit.

5.2 Construction Change Directives

5.2.1 The allowance for the combined overhead and profit included in the total cost to the Owner shall be based on the following schedule:

1. For the Contractor and for work performed by the Contractor’s own forces, fifteen percent (15%) of the cost.
2. For the Contractor and for work performed by the Contractor’s Subcontractor, five percent (5%) of the amount due the Subcontractor.
3. There shall be no Subcontractor’s Sub-subcontractor involved in any work whatsoever.

5.2.2 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs, including labor, materials and Subcontracts. Labor and materials shall be itemized in a clearly discernable and traceable manner. Where major cost items are Subcontracts, they shall be itemized also.

ARTICLE 6: PAYMENTS AND COMPLETION

6.1 Application for Payment

6.1.1 The form of Application for Payment shall be a notarized A.I.A. Document G702, Application and Certification for Payment, supported by A.I.A. Document G703, Continuation Sheet.

6.1.2 Progress payments shall be made monthly in amounts not to exceed ninety percent (90%) of the cost of work done and ninety percent (90%) of the value of materials stored at the site. Cost of work is defined as material, labor, overhead and profit. Value of materials shall be defined as actual cost of materials. The Contractor shall submit vouchers from material dealers to substantiate his claim of material cost.
6.1.3 Starting with the second request for payment, lien waivers shall be submitted (in duplicate) for all Subcontractors and material suppliers for the first month’s payment. Thereafter, lien waivers shall be submitted for each month (in duplicate).

6.1.4 Payments of the retained percentage (10%) shall not become due until the Contractor shall deliver to the Owner a complete release of all claims of liens arising out of the Contract at the completion of the Contract.

ARTICLE 7: INSURANCE REQUIREMENTS

7.1 Contractor shall obtain and maintain the following insurance coverage’s with the listed coverage limits throughout the extended life of this agreement:

1. Commercial General Liability  $ 1,000,000
2. Automobile Liability - $ 1,000,000
3. Products – Completed Operations $ 1,000,000
4. Workers’ Compensation Florida Statutory Limits (Minimum)
5. Employers Liability - $500,000
6. Builder’s Risk - Full amount of Construction Contract

7.1.2 Liability coverage’s shall be on an occurrence basis and shall reflect a combined single limit as show above. Coverage must be issued following wording in the latest edition of the ISO Comprehensive General Liability policy and without restrictive endorsements.

7.1.3 Contractor shall require their insurance Agent or Carrier to provide the Town with a Certificate of Liability Insurance on a standard ACORD form or equivalent form showing the policy Effective Date and Expiration Date for each of the above listed coverage’s and shall replace any expiring certificates with new certificates throughout the life of this agreement and any required extended coverage period. Each such Certificate of Insurance shall be sent to and shall list the following as the Certificate Holder:

   Town of Davie
   Attn: Contracts Administration
   6591 Orange Drive
   Davie, FL 33314

7.1.3.1 Each such Certificate shall include the following wording: “the Town of Davie, its officers, and employees are named as additional insured’s with respect to the work performed under this agreement”. The Engineer, Calvin Giordano and Associates Inc, shall be listed as additionally insured.

7.1.3.2 Each such Certificate of Insurance shall provide for 30 days prior written notice to the Certificate Holder of any cancellation prior to the expiration date of the coverage’s listed on the certificate.

7.1.3.3 Contractor shall require any sub-contractors to comply with these requirements in the same manner that Contractor is required to comply or Contractor shall provide for “General Contractors Insurance” coverage that provides the above coverage’s for themselves as well as any subcontractor working under them.
7.1.3.4 Nothing in this Agreement shall be construed to affect in any way the Town’s
rights, privileges, and immunities, including sovereign immunity as provided by
law as set forth in Florida Statute 768.28.
ADDITIONAL GENERAL CONDITIONS

“CODES, ORDINANCES, PERMITS AND LICENSES”

The building permit for the permanent structure shall be obtained by the Contractor. The cost of all permits, inspections and miscellaneous fees shall be paid by the Contractor.

“MATERIALS AND APPLIANCES”

STANDARDIZATION AND UNIFORMITY OF EQUIPMENT AND CERTAIN MATERIALS

To ensure standardization and uniformity in all parts of the work under this Contract, like items of equipment shall be the products of one manufacture. Like items of certain materials shall be the products of one manufacturer.

Uniformity in like equipment items is required in order to provide the Owner with interchangeability capabilities, simplified spare parts inventory and standardized maintenance programs and manufacturers’ services.

Uniformity in certain like material items is required in order to provide the Owner with a simplified spare materials inventory, continuity in patterns, color and texture, and a standardized procedure for maintenance care and manufacturers’ services. Generally, material items exempt from standardization include structural steel, reinforcing steel, building insulation, roofing materials, sheet metal, materials specified only by reference to a recognized standard and items hidden from view where interchangeability, color and texture is not a significant factor for standardization.

The Contractor shall inform his suppliers and subcontractors of these requirements and shall provide the necessary coordination to accomplish the standardization specified.

AS-BUILT DRAWINGS AND SURVEY

A marked up set of prints will be kept up to date by the Contractor on the job site at all times. All trades are to record any and all variances to the plans as the work progresses. This record will be given to the Engineer and properly labeled “As-Built Drawings” during pay request submittals.

The Contractor will have prepared by a Surveyor, registered in the State of Florida, The signed and sealed “Record Drawings” which shall clearly represent all final work done under this Contract.

Final payment will be withheld from the Contractor until “Record Drawings” are furnished to the Owner’s representative.

OWNERSHIP OF DRAWINGS

All drawings, specifications and copies thereof furnished by the Consultant are the Town’s property. They are not to be used on other work, without the express written consent and authorization from the Town of Davie.
TEMPORARY SANITARY SEWERS

The Contractor shall provide and maintain, in a neat and sanitary condition, such accommodations for the use of his employees as may be necessary to comply with the regulations of the State Board of Health and to the local Health Department. No nuisance will be permitted. Upon completion of the work, such facilities shall be removed and the premises left in a sanitary condition.

SPECIAL HURRICANE PRECAUTION

During such periods of time as are designated by the United States Weather Bureau as being a hurricane warning or alert, all construction materials or equipment shall be secured against displacement by wind forces, provided that where a full complement of personnel is employed or otherwise in attendance or engaged for such protection purposes, normal construction procedures or uses of materials or equipment may continue, allowing such reasonable time as may be necessary to secure such materials or equipment before winds of hurricane force are anticipated. Construction materials and equipment shall be secured by guy ing and shoring, by tying down loose materials, equipment and construction sheds. Hurricane plan shall be submitted for approval.

PUBLIC RECORDS REQUEST: Per Florida Statues F.S. 119.071(3)(ee) the Contractor is hereby notified that:

Building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a building, arena, stadium, water treatment facility, or other structure owned or operated by an agency as defined in s. 119.011 are exempt from the provisions of subsection (1) and s. 24(a), Art. I of the State Constitution. This exemption applies to building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a building, arena, stadium, water treatment facility, or other structure owned or operated by an agency before, on, or after the effective date of this act. Information made exempt by this paragraph may be disclosed to another governmental entity if disclosure is necessary for the receiving entity to perform its duties and responsibilities; to a licensed Engineer, engineer, or contractor who is performing work on or related to the building, arena, stadium, water treatment facility, or other structure owned or operated by an agency; or upon a showing of good cause before a court of competent jurisdiction. The entities or persons receiving such information shall maintain the exempt status of the information.

END OF DOCUMENT
PERMITTING

1. The building plans will be reviewed by the City of Hollywood Building Department and Utilities Department. All review comments will be revised by the Consultants. The General Contractor is to complete the plan permitting process. The General Contractor is to obtain all other agency stamps including: Broward County Environmental Protection and Growth Management Department, City of Hollywood Building Permit, Town of Davie Engineering and Building Permit.

2. Approved MOT plan.

3. Dewatering permit and fees are the responsibility of Contractor.

END OF DOCUMENT
SECTION 01010
SUMMARY OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION
   A. This section includes general descriptions of the Contractor use of site, location of work, description of work, work sequence, owner occupancy, and work by others.

1.02 RELATED SECTIONS
   A. Section 01015 – General Requirements
   B. Section 01025 – Measurement and Payment
   C. Section 01505 – Control of Work
   D. Other Sections as applicable.

1.03 REFERENCES (NOT USED)

1.04 CONTRACTOR USE OF SITE
   A. The Contractor shall limit his area of work to remain within those properties and easements as depicted in the Drawings or as approved in writing by the Owner.
   B. Contractor’s use of lands other than those depicted in the Drawings shall require written approval from the land owner and be at the Contractor’s risk and cost.

1.05 LOCATION OF WORK
   A. The work is located within portions of NW 73rd Avenue right-of-way just north of Forrest Street in the City of Hollywood, Florida.

1.06 DESCRIPTION OF WORK
   The following is a general list of the work included. It is not intended to be complete. Consult the contract drawings and specifications for all contract requirements.
   A. Existing suction lift pumps and motors are to be replaced with the same size equipment. The existing control panel is to be replaced and relocated above ground.

1.07 WORK SEQUENCE
   A. Set up temporary by-pass pumping.
   B. Remove existing pumps, motors, and other specified mechanical and electrical equipment per the Contract Documents.
C. Install new pumps, motors, valves and piping.
D. Install new electrical equipment and panels.
E. Startup testing of all equipment.

1.08 OWNER OCCUPANCY

A. Cooperate with Owner to minimize conflict, and to facilitate Residences and Owner’s operations.
B. Schedule the Work to accommodate this requirement.

1.09 WORK BY OTHERS

A. The Contractor is advised that work by others may take place during the duration of the contract time. It shall be the Contractor's responsibility to coordinate and schedule all Work as not to delay or hinder his work or the work by others.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01012
MEASUREMENT AND PAYMENT
LUMP SUM BID

PART 1 - GENERAL

1.01 DESCRIPTION
A. This Section includes administrative and procedural requirements for determining Work completed and ready for payment under a Lump Sum Bid where the Contractors approved Schedule of Values is utilized in Applications for Payment.

1.02 RELATED SECTIONS
A. Section 00300 – Bid Form
B. Section 01152 – Applications for Payment
C. Section 01370 – Schedule of Values
D. Other Sections as applicable.

1.03 REFERENCE STANDARDS
A. Manual of Uniform Traffic Control Devices (MUTCD)
B. FDOT Standard Specification for Road and Bridge Construction (Standard Specifications)
C. FDOT Design Standards for Design, Construction, Maintenance and Utility Operations in the State Highway System (Standard Indexes)
D. Broward County Public Works and Transportation Department, Highway Construction and Engineering Division Minimum Standards

1.04 GENERAL REQUIREMENTS
A. Prices shall include all costs required for the completed, in-place construction of the specified unit of work. This may include but not be limited to, materials and delivery; cost of installation; incidentals; labor including social security, insurance, and other required fringe benefits; workman’s compensation insurance; bond premiums; rental of equipment and machinery; taxes; testing; surveys; incidental expenses; and supervision.
B. Installation, acceptance and payment shall be in accordance with the REFERENCE STANDARDS.
C. The Owner reserves the right to reject the Contractor’s measurement of completed work that involves use of established unit prices, and to have this Work measured by an independent surveyor acceptable to the Contractor at the Owner’s expense.

D. Contract Sum adjustments will be by Change Order on basis of net accumulative change for each price category.

1. Except as otherwise specified, the unit prices found in the approved Schedule of Values shall apply to both deductive and additive variations of quantities.

2. Unit prices in the approved Schedule of Values shall remain in effect until date of final completion of the entire Work.

E. Partial payment for material and equipment properly stored and protected will be made in accordance with requirements of the General Conditions.

F. Abbreviations:

1. Acre - AC
2. Allowance - AL
3. Cubic Yard - CY
4. Each - EA
5. Furnish and Install - F & I
6. Gallons - GA
7. Gross Mile - GM
8. Linear Feet – LF
9. Lump Sum - LS
10. Million Gallons – MG
11. Net Mile - NM
12. Square Foot – SF
13. Square Yard – SY
14. Ton – TN

1.05 MEASUREMENT AND PAYMENT

A. Payment shall constitute full compensation and will be made as indicated in the RELATED SECTIONS.

B. The quantity approved for payment shall be either:

1. Percentage of the unit prices contained in the approved Schedule of Values as determined by the Engineer as of the date of the pay request submitted.

2. Measured Quantities - The actual quantities in-place and accepted as measured by the Engineer on the date of the pay request submitted in the units specified in the unit prices contained in the approved Schedule of Values.
C. Pay items which are not specifically mentioned in this section are to be considered incidental to construction and shall not require a separate line in the approved Schedule of Values.

1.06 PROTECTION

A. Where pavement, pipes, valves, appurtenances, trees, shrubbery, fences, other property or structures are in proximity to the WORK, adequate protection shall be provided. Such protection is considered incidental to construction and shall not be assigned to any pay item.

1.07 RESTORATION

A. Where pavement, pipes, utilities, valves, structures, appurtenances, trees, shrubbery, fences, other property or structures not designated as pay items, have been damaged, removed or disturbed by the Contractor, whether deliberately or through failure to carry out the requirements of the Contract Documents, state laws, municipal ordinances or the specific direction of the Engineer, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor to a condition equal to that before work began within a time frame approved by the Engineer. Such restoration is considered incidental to construction and shall not be assigned to any pay item.

1.08 TESTING AND SURVEY

A. All survey layout and record drawings shall be considered incidental to the cost of construction as defined in individual line items and shall include all calculations and field work required, in order to establish all horizontal and vertical controls, set all stakes needed, such as grade stakes, offset stakes, reference point stakes, slopes stakes, and other reference marks or points necessary to provide lines and grades for construction and as-builting of all roadway, utility construction and miscellaneous items.

B. All testing shall be considered incidental to the cost of construction as defined in individual line items and shall include all field testing and laboratory work including reports as required by the plans and specifications.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS - BID ITEM NO. 1

A. Payment will be made as a percentage of the lump sum contained in the approved Schedule of Values

B. The lump sum price shall include the cost of bonds, insurance, licenses and all administrative costs not specifically identified in other bid items.
C. The lump sum price shall exclude the cost of construction material and installation.

3.02 MOBILIZATION/DEMOBILIZATION – BID ITEM NO. 2

A. Payment will be made as a percentage of the lump sum contained in the approved Schedule of Values.

B. The Lump Sum Price shall include compensation for all labor, materials, equipment and all other incidentals required for all temporary facilities, transportation, communications, office, maintenance, project signs, and any other pre- or post-construction expenses necessary for the start or cessation of the Work, not specifically identified in the costs of the work.

C. No further payment shall be made for remobilization unless all of the work is suspended by the Engineer for a period in excess of three months and through no fault to the Contractor.

D. The cost of mobilization and demobilization shall not exceed 5% of the contract price.

3.03 MAINTENANCE OF TRAFFIC – BID ITEM NO. 3

A. Payment shall be made based on a percentage of the lump sum contained in the approved Schedule of Values installed in accordance with the MOT permits and properly maintained.

B. The cost shall include full compensation for required labor, materials, all necessary temporary pavement markings, temporary pavement, temporary business signage, professional fees, and equipment necessary to provide traffic control for two way traffic at all times in accordance with the Contract Documents. MOT shall include both vehicular and pedestrian requirements.

C. MOT permits and approvals from the applicable regulatory agencies, including but not limited to FDOT, Broward County Highway Construction and Engineering Division, and the City of Hollywood are the responsibility of the contractor. All MOT plans to be sealed by a Florida Registered Engineering holding a current FDOT MOT certificate.

D. The cost of MOT shall not exceed 3% of the contract price.

3.04 DEMOLITION – BID ITEM NO. 4

A. Payment shall be made at the Contractor’s Lump Sum Price.

B. Contractor’s cost shall include all material, labor, and equipment required to remove and properly dispose of all existing pumps, motors, valves, piping, electrical panels, wiring, and other miscellaneous items as specified in the Contract Documents. Price shall also include temporary by-pass pumping.
3.05  PUMPS AND MOTORS – BID ITEM NO. 5

A. Payment shall be made based on a percentage of the lump sum contained in the approved Schedule of Values.

B. Contractor’s price shall include of labor, material, and equipment required to procure and install the specified pumps and motors. This price shall include, but not be limited to, bases, belts, sheaves, temporary by-pass pumping, testing, startup, and training.

3.06  ELECTRICAL AND INSTRUMENTATION – BID ITEM NO. 6

A. Payment shall be made based on a percentage of the lump sum contained in the approved Schedule of Values.

B. Contractor’s price shall include all labor, material, and equipment required to procure and install the specified electrical and instrumentation equipment. This price shall include coordination with FPL and removal and relocation of existing equipment as specified in the Contract Documents.

3.07  MECHANICAL (VALVES, PIPING, BLOWER, SUMP PUMP, PAINTING) – BID ITEM NO. 7

A. Payment shall be made based on a percentage of the lump sum contained in the approved Schedule of Values.

B. Contractor’s price shall include all labor, material, and equipment required to procure and install the specified piping, pipe supports, coring existing structures, valves, blowers, sump pump, protective coatings, duct work, connecting to existing piping, sealing abandoned core holes, and testing. Price shall also include temporary by-pass pumping.

C. Contractor’s price shall also include pressure cleaning and painting the existing dry station in accordance with the Contract Documents.

3.08  PERMITTING ALLOWANCE – BID ITEM NO. 8

A. Payment for Permitting Allowance shall be made at the amount that will be determined at the time of permitting by the Contractor.

B. Any difference between the payment and the permitting allowance shall become a credit or debit change order to the Contract.

END OF SECTION
SECTION 01015
GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION
A. This Section provides for miscellaneous provisions applicable to the Work.

1.02 RELATED SECTIONS
A. Section 01090 - References
B. Section 01310 – Construction Schedules
C. Section 01340 – Shop Drawings, Working Drawings and Samples
D. Section 01530 – Protection of Existing Property
E. Section 01570 – Traffic Regulation
F. Section 01720 – Project Record Documents
G. Section 15010 – Testing Piping Systems
H. Other Sections as applicable.

1.03 TERMINOLOGY
A. Throughout the Contract Documents, the following definitions apply:
   1. Owner - The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
   2. Work - The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

1.04 SAFETY
A. All work shall be done in a safe manner and in strict compliance with all requirements of the Federal Occupational Safety and Health Act (OSHA), The Florida Trench Safety Act and all other State and local safety and health regulations.
B. The Contractor shall comply promptly with such safety regulations as may be prescribed by the Owner or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of, his employees. In the event of the Contractor’s failure to comply, the Owner may take the necessary measures to correct the conditions or practices complained of, and all costs thereof will be deducted from any monies due. Failure of the Owner to direct the correction of unsafe conditions or practices shall not relieve the Contractor of his responsibilities.

C. The Contractor shall provide, erect and maintain as necessary, strong and suitable barricades, danger signs and warning lights for the protection of the public in accordance with Section 01570 – Traffic Regulation.

1.05 APPLICABLE CODES

A. The Contractor shall comply with the applicable standards codes and specifications governing the Contract Documents whether City, County, State or Federal. The Contractor is obligated to notify the Owner and Engineer of any deficiency contained in the Contract Documents immediately upon discovery. Where conflicts exist in such, the more stringent shall govern.

1.06 APPLICABLE PERMITS AND LICENSES

A. The Contractor shall abide by all permit conditions, whether, general, specific, limited or otherwise. A copy of all applicable permits and licenses, with the exception of City permits obtained by the Contractor, are attached hereto and made a part of the Contract Documents.

1.07 PUBLIC BID DISCLOSURE ACT 218.80 FS

A. All the local governmental entity permits or fees are to be disclosed, including, but not limited to, all license fees, permit fees, impact fees, or inspection fees, payable by the contractor to the unit of government that issued the bidding documents or other governmental agency,

B. The following permits are required for this project: Town of Davie Engineering and Building Department and the City of Hollywood Building Department. The cost for these permits is accounted for in the Permitting Allowance of found in the Bid Form.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION RESPONSIBILITIES

A. Upon receipt of the Notice To Proceed, the Contractor shall arrange for a Pre-Construction meeting. The meeting shall be held with a minimum of one weeks’ notice and shall include the Engineer, the Owner and Representatives for all affected utility companies.
3.02 TEMPORARY UTILITIES

A. The Contractor shall be responsible to arrange for and supply all temporary utilities including, but not limited to, water, sewer and electricity.

B. The cost of temporary utilities shall be considered incidental to the cost of the Work and is therefore included in the Bid.

3.03 UNDERGROUND LOCATING SERVICE

A. Prior to underground construction, the Contractor is required by the Underground Facility Damage Prevention and Safety Act, Chapter 556 FS to contact Sunshine 811, for the location of underground utilities.

3.04 HURRICANE PREPAREDNESS PLAN

A. Should the performance of the Work occur during Hurricane Season, within thirty days of the date of Notice to Proceed, the Contractor shall submit to the Engineer and Owner a Hurricane Preparedness Plan. The plan should outline the necessary measures that the Contractor proposes to perform at no additional cost to the Owner in case of a hurricane warning. The plan shall detail these measures with specific action items defining responsible personnel.

3.05 INCLEMENT WEATHER

A. In the event of inclement weather, or whenever Engineer shall direct; Contractor will cause Subcontractors to protect carefully the Work and materials against damage or injury from the weather. If, in the opinion of the Engineer, any portion of Work or materials shall have been damaged or injured by reason of failure on the part of Contractor or any Subcontractor to so protect the Work, such Work and materials shall be removed and replaced at the expense of the Contractor.

B. PROTECTION OF WORK AND MATERIAL

C. During the progress of the work and up to the date of final payment, the Contractor shall be solely responsible for the care and protection of all work and materials covered by the Contract.

D. All work and materials shall be protected against damage, injury or loss from any cause whatsoever, and the Contractor shall make good any such damage or loss at his own expense. Protection measures shall be subject to the approval of the Owner and Engineer.

3.06 CONTRACTOR USE OF PREMISES

A. Contractor shall have limited use of the premises for construction operations, including limited use of the site. The Contractor’s use of the premises is further limited to the Owner’s right to perform construction operations with its own forces or to employ separate Contractors on portions of the project.
B. The Contractor shall be responsible for coordinating his daily activities in conjunction with any Contractors presently working within the vicinity of this project.

C. Confine operations to areas within rights-of-way and easements.

D. Keep existing driveways and entrances serving the premises clear and available to the Owner, Residents and the Owner's employees at all times.
   1. Do not use these areas for parking or storage of materials.
   2. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

3.07 ENVIRONMENTAL PROTECTION

A. Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result.
   1. Adjustment of existing utilities

B. The Contractor shall raise or lower all manholes, valve boxes, etc. to finished grade. The cost of these adjustments shall be considered incidental to the cost of the Work and is therefore included in the Bid.

3.08 EXISTING IRRIGATION

A. All existing irrigation systems within the area of the Work shall be restored to original condition or better and adjusted to finished grade. The cost of repairs and/or adjustment to existing irrigation shall be considered incidental to the cost of the Work and is therefore included in the Bid.

3.09 DEMOLITION

A. Limits of demolition which may be shown in the Contract Documents are general in nature. Actual limits of demolition shall be as determined by the field conditions in conformance with the requirements of the Work.

B. All sidewalks within the limits of construction which are not ADA compliant (cross-slopes which exceed 2% and/or running slopes which exceed 5% and/or changes in level of ¼” or greater) shall be demolished and reconstructed to meet these requirements.

C. When sidewalk tie-ins exist outside the limits of construction which are not ADA compliant, the Contractor shall replace those sections as directed by the Owner.

END OF SECTION
SECTION 01021
OWNER ALLOWANCES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section provides for administrative procedures for the Contractors utilization of monetary amounts for Owner Allowances when contained in the Contract Price or Total Base Bid.

B. The Contractor has included in the Contract Price all Allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

C. The Contractor agrees that an Allowance, if any, is for the sole use of Owner to cover unanticipated or undetermined costs.

D. All Owner Allowances which remain unused, in whole or in part, remain the property of the Owner.

1.02 RELATED SECTIONS

A. Section 00300 - Bid Form

B. Section 01012 – Measurement and Payment

C. Section 01152 – Application for Payment

D. Section 01310 - Construction Schedules

E. Section 01340 – Shop Drawings, Working Drawings and Samples

F. Other Sections as Applicable

1.03 SCHEDULE OF ALLOWANCES

A. Refer to Section 00300 – Bid Form

1.04 PROCEDURES FOR ADMINISTRATION OF ALLOWANCES

A. Funds will only be drawn from Owner Allowances by Change Order.

B. Costs shall be as represented in the Unit Price Schedule.

C. Payment shall be as represented in Section 01012 – Measurement for Payment.
1.05 COSTS INCLUDED IN ALLOWANCES

A. Cost of materials to Contractor, less applicable trade discounts.

B. Delivery to site, products handling at site, including unloading, uncrating, and storage.

C. Applicable taxes unless covered by Owner Furnished Equipment agreement.

D. Protection of products from elements and from damage.

E. All labor, insurance, payroll, bonding, equipment rental, expenses for the installation and finishing necessary for a complete working system or product.

F. Other expenses required to complete installation.

G. Contractor field and home office overhead and profit.

1.06 CONTRACTOR RESPONSIBILITIES

A. Promptly notify Engineer of any reasonable objections from supplier.

B. On notification of selection, execute purchase agreement with designated supplier.

C. Arrange for process shop drawings, product data, and samples.

D. Arrange for delivery. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

E. Install, adjust, and finish products.

F. Provide warranties for products and installation.

1.07 CORRELATION WITH CONTRACTOR SUBMITTALS

A. Schedule shop drawings, product data, samples, and delivery dates, in Progress Schedule for products selected under allowances.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01045
CUTTING AND PATCHING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Contractor shall be responsible for all cutting, fitting and patching required to complete the work or to:

1. Make its several parts fit together properly.
2. Uncover portions of the Work to provide for installation of ill-timed work.
3. Remove and replace defective work.
4. Remove and replace work not conforming to requirements of Contract Documents.
5. Remove samples of installed work as specified for testing.
6. Investigate subsurface conditions or utilities.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01015 – General Requirements
C. Other Sections as applicable

1.03 SUBMITTALS

A. Submit a written request to the Engineer in advance of executing any cutting or alteration which affects:

1. Work of the Owner or any separate contractor.
2. Structural value or integrity of any element of the Project.
3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
4. Efficiency, operational life, maintenance or safety of operational elements.
5. Visual qualities of sight-exposed elements.

B. Request shall include:

1. Identification of the Project.
2. Description of affected work.
3. The necessity for cutting, alteration or excavation.
4. Effect on work of Owner or any separate contractor, or on structural or weatherproof integrity of Project.

5. Description of proposed work:
   a. Scope of cutting, patching, alteration, or excavation.
   b. Trades who will execute the work.
   c. Products proposed to be used.
   d. Extent of refinishing to be redone.

6. Alternatives to cutting and patching.

7. Cost proposal, when applicable.

8. Written permission of any separate contractor whose work will be affected.

C. Submit written notice to the Engineer designating the date and the time work will be uncovered.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Comply with specifications and standards for each specific project involved.

PART 3 - EXECUTION

3.01 INSPECTION

A. Inspect existing conditions of Project, including elements subject to damage or to movement during cutting or patching.

B. After uncovering work, inspect conditions affecting installation of Products, or performance of work.

C. Report unsatisfactory or questionable conditions to the Engineer in writing; do not proceed with work until the Engineer has provided further instructions.

3.02 PREPARATION

A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of Work.

B. Provide devices and methods to protect other portions of Project from damage.

C. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching work, and maintain excavations free from water.
3.03 PERFORMANCE

A. Execute cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.

B. Execute cutting methods which will prevent settlement or damage to other work.

C. Employ original Installer or Fabricator to perform cutting and patching for:
   1. Weather-exposed or moisture-resistant surfaces.
   2. Sight-exposed finished surfaces.

D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.

E. Restore work which has been cut or removed; install new products to provide completed Work in accord with requirements of Contract Documents.

F. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
   1. For continuous surfaces, refinish to nearest intersection.
   2. For an assembly, refinish entire unit.

END OF SECTION
PART 1 - GENERAL

1.01   DESCRIPTION

   A. Furnish all labor, materials, equipment and incidentals required to modify, alter and convert existing structures as shown or specified and as required for the installation of new mechanical equipment, piping and appurtenances. Existing piping and equipment shall be removed, salvaged, abandoned or dismantled as necessary for the performance of the Work.

1.02   RELATED SECTIONS

   A. Section 01045 - Cutting and Patching
   B. Section 01310 - Construction Scheduling
   C. Other Sections as applicable

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01   GENERAL

   A. The Contractor shall cut, repair, reuse, excavate, demolish or otherwise remove parts of the existing structures or appurtenances, as indicated on the Drawings or specified herein or necessary for the performance of the Work.

   B. The above work shall include the cutting of grooves and chases in existing masonry to permit the proper bonding of new masonry to old, repainting of existing masonry, the drilling of holes into bolts, or other appurtenances, and the cutting of holes in masonry for the installation of pipe, conduits, and other appurtenances. The work shall include all necessary cutting and bending of reinforcing steel, structural steel, or miscellaneous metal work found embedded in the existing structures.

   C. Blasting with explosives will not be permitted to complete any work under this Contract.

   D. Care shall be taken not to damage any part of existing buildings, foundations and exterior structures both below and above ground.
E. No existing structure, equipment, or appurtenance shall be shifted, cut, removed, or otherwise altered except with the express approval of and to the extent approved by the Engineer.

F. When removing materials or portions of existing structures and when making openings in walls and partitions, the Contractor shall take all precautions and use all necessary barriers and other protective devices so as not to damage the structures or contents by falling or flying debris and not to damage the structures from excavation or undermining of existing structural supports, beams, footings, columns or any structural member.

G. Materials and equipment removed in the course of making alterations and additions shall remain the property of the Owner, except that items not salvageable, as determined by the Engineer and the Owner shall become the property of the Contractor to be disposed of by him off the site of the work at his own place of disposal. The Contractor shall assist the Owner in loading and hauling of salvageable materials within the City limits of the project.

H. All work of altering existing structures shall be done at such time and in such manner as will comply with the approved time schedule. So far as possible before any part of the work is started, all tools, equipment, and materials shall be assembled and made ready so that the work can be completed without delay.

I. All workmanship and new materials involved in constructing the alterations shall conform to the General Specifications for the classes of work insofar as such specifications are applicable.

J. All cutting of existing masonry or other material to provide suitable bonding to new work shall be done in a manner to meet the requirements of the respective section of these specifications covering the new work. When not covered, the work shall be carried on in the manner and to extent directed by the Engineer.

K. Where holes in existing masonry are required to be sealed, unless otherwise herein specified, they shall be sealed with cement mortar or concrete. The sides of the openings shall be provided with keyed joints and shall be suitably roughened to furnish a good bond and make a watertight joint. All loose or unsound material adjacent to the opening shall be removed and, if necessary, replaced with new material. The method of placing the mortar seal shall provide a suitable means of releasing entrapped air.

L. Surfaces of seals visible in the completed work shall be made to match as nearly as possible the adjacent surfaces.

M. Non-shrink grout shall be used for setting wall castings, sleeves, leveling pump bases, doweling anchors into existing concrete and elsewhere as shown.

N. Operating equipment shall be thoroughly cleaned and then lubricated and greased for protection during prolonged storage.
O. The Contractor shall provide flumes, hoses, piping, etc. to divert or provide suitable plugs, bulkheads or other means to hold back the flow of wastewater, water or other liquids, all as required in the performance of the work under this Contract.

3.02 SALVAGE

A. Any existing equipment or material, including but not limited to, motors, electrical components or controls, pipes, fittings, couplings, etc., which is removed or replaced as a result of construction under this project may be designated as salvage by the Engineer or Owner, and, if so, shall be removed or excavated, if necessary, and delivered to the Owner at a location directed by the Owner. Any equipment or material not worthy of salvaging, as directed by the Owner, shall be disposed of by the Contractor at a suitable location.

3.03 CONNECTING TO EXISTING PIPING AND EQUIPMENT

A. The Contractor shall verify exact location, material, alignment, joint, etc. of existing piping and equipment prior to making the connections called out in the Drawings. The verifications shall be performed with adequate time to correct any potential alignment or other problems prior to the actual time of connection.

B. The Contractor shall dismantle and remove all existing equipment, piping and other appurtenances required, he shall cut existing pipelines for the purpose of making connections thereto. Anchor bolts for equipment and structural steel removed shall be cut off one inch below the concrete surface. Surface shall be finished as specified in Division 3.

C. At the time that a new connection is made to an existing pipeline, additional new piping, extending to and including the most convenient new valve, shall be installed.

D. Where necessary or required for the purpose of making connections, the Contractor shall cut existing pipe lines in a manner to provide an approved joint. Where required, he shall weld beads, flanges or provide Dresser Couplings, all as specified and required.

END OF SECTION
PART 1 - GENERAL

1.01 DESCRIPTION

A. Provide and pay for field Engineering and surveying services required for Project as follows:

1. Surveying work required for the lay-out and execution of Work.
2. Surveying work required to identify and maintain existing control points, bench marks and property line corners.
3. Surveying work required to verify existing utility locations.
4. Surveying work as required to create Project Record Documents.
5. Civil, structural, or other professional Engineering services specified, or required to execute the Contractor's construction methods.
6. Testing, sampling, calibrating and training services specified, or required to execute the Contractor's construction methods including soils, concrete, material, etc.

1.02 RELATED SECTIONS

A. Section 01410 – Materials and Installation Testing
B. Section 01720 - Project Record Documents
C. Other Sections as applicable.

1.03 QUALIFICATIONS OF PROFESSIONAL

A. Florida Registered Professional Surveyor and Mapper, acceptable to the Owner and the Engineer.

B. Florida Registered Professional Engineer(s) of the specialty required for on the Project, acceptable to the Owner and the Engineer.

1.04 INSURANCE REQUIREMENTS

A. Professional Engineers specified, or required to execute the Contractor's construction methods shall carry the following insurance to remain in force for the duration of the project:
1. Commercial General Liability – Bodily Injury and Property Damage
   Combined Single Limit

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<tr>
<td>Each Occurrence</td>
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<tr>
<td>Project Aggregate</td>
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<td>General Aggregate</td>
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<td>Personal Injury</td>
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<td>Products/Completed Operations</td>
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2. Business Automobile Liability – Bodily injury and property damage, combined single limit.

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<td>Any one accident</td>
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   Endorsements Required – Waiver of Subrogation.

3. Workers Compensation and Employers Liability – Per Florida Statute 440

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<tr>
<td>Employers Liability</td>
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4. Professional Liability or Errors and Omissions Coverage

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<tr>
<td>Each Claim</td>
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<tr>
<td>General Aggregate Limit</td>
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<tr>
<td>Deductible not to exceed</td>
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5. Additional Insured shall include Calvin, Giordano and Associates, Inc. and the Town of Davie.

6. Insurance shall be provided by an A.M. Best’s “A” rating or better insurance company authorized to issue insurance policies in the State of Florida, subject to approval.

1.05 SURVEY REFERENCE POINTS

   A. Horizontal and vertical control points for the Project are to be established by the Engineer and provided to the Contractor.

   B. Locate and protect control points prior to starting work, and preserve all permanent reference points during construction.

   1. Make no changes or relocations without prior written notice to the Engineer.

   2. Report to the Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

   3. Require surveyor to replace project control points which may be lost or destroyed.

      a. Establish replacements based on original survey control.
1.06 PROJECT SURVEY REQUIREMENTS

A. Establish a minimum of two temporary bench marks on site, referenced to data by survey control points.
   1. Record locations, with horizontal and vertical data, on Project Record Documents.

B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:
   1. Site Improvements
      a. Line and grade of pipe and structure installation; top of pipe, invert, slope, etc.
      b. Grading for fill and topsoil placement, roadway sub-base and base installation.
   2. Controlling lines and levels required for all trades.

C. From time to time, verify layouts by same methods.

1.07 RECORDS

A. Maintain a complete, accurate log of all control and survey work as it progresses in accordance with Section 01720.

1.08 SUBMITTALS

A. Submit name and address of Professional Surveyor and Mapper or Professional Engineer to the Engineer.

B. On request of the Engineer, submit documentation to verify accuracy of field Engineering work.

C. Submit certificate signed by registered surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.

D. Submit Project Record Documents in accordance with Section 01720.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01090

REFERENCES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Applicable Publications: Whenever in these specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the WORK is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the drawings shall be waived because of any provision of, or omission from, said standards or requirements.

B. Specialists, Assignments: In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These assignments shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the WORK; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. The final responsibility for fulfillment of the entire set of contract requirements remains with the Contractor.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of the specifications, all work specified herein shall conform to or exceed the requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of these Specifications nor the applicable codes.

B. References herein to "Building Code" or "Code" shall mean the Florida Building Code. The latest edition of the code as approved and used at the local agency having jurisdiction, shall apply to the WORK herein, including, all addenda, modifications, amendments, or other lawful changes thereto.

C. In case of conflicts between codes, reference standards, drawings and other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarifications and directions prior to ordering or providing any materials or labor. The Contractor shall bid the most stringent requirements.
D. Applicable Standard: The Contractor shall construct all Work in accordance with the requirements of the Contract Documents, building codes and referenced standards specified herein.

E. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations, including all changes and amendments thereto.

F. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

1.03 ABBREVIATION

A. Wherever in these specifications references are made to the standards, specifications, or other published data of the various national, regional, or local organizations, such organizations may be referred to by their acronyms or abbreviation only. As a guide to the user of these specifications, the following acronyms and abbreviations which may appear in these specifications shall have the meanings indicated herein.

1.04 ABBREVIATIONS AND ACRONYMS

A. Abbreviations and acronyms contained in the Contract Documents may include, but not be limited to, the following:

- AAMA Architectural Aluminum Manufacturer's Association
- AAR Association of American Railroads
- AASHTO American Association of the State Highway and Transportation Officials
- AATCC American Association of Textile Chemists and Colorists
- ACI American Concrete Institute
- ACPA American Concrete Pipe Association
- ACPPA American Concrete Pressure Pipe Association
- AFBMA Anti-Friction Bearing Manufacturer's Association, Inc.
- AGA American Gas Association
- AGC Associated General Contractors
- AGMA American Gear Manufacturer's Association
- AHAM Association of Home Appliance Manufacturers
- AI The Asphalt Institute
- AIA American Institute of Architects
- AISC American Institute of Steel Construction
- AISI American Iron and Steel Institute
-AITC American Institute of Timber Construction
- AMCA Air Movement and Control Association
-ANS American Nuclear Society
- ANSI American National Standards Institute, Inc.
- APA American Plywood Association
- API American Petroleum Institute
- APWA American Public Works Association
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<td>AREA</td>
<td>American Railway Engineering Association</td>
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<td>American Water Works Association</td>
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<td>BBC</td>
<td>Basic Building Code, Building Officials and Code Administrators International</td>
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<td>BHMA</td>
<td>Builders Hardware Manufacturers Association</td>
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<td>CBM</td>
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<td>Institute of Electrical and Electronic Engineers</td>
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<td>NBS</td>
<td>National Bureau of Standards</td>
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<td>NCCLS</td>
<td>National Committee for Clinical Laboratory Standards</td>
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<td>NEC</td>
<td>National Electric Code</td>
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NEMA National Electrical Manufacturers Association
NFPA National Fire Protection Association
NFPA National Forest Products Association
NGLI National Grease Lubricating Institute
NMA National Microfilm Association
NRCA National Roofing Contractors Association
NWMA National Woodwork Manufacturers Association
NWWA National Water Well Association
OSHA Occupational Safety and Health Administration
PCA Portland Cement Association
PCI Precast Concrete Institute
PDI Plumbing and Drainage Institute
RIS Redwood Inspection Service
RVIA Recreational Vehicle Industry Association
RWMA Resistance Welder Manufacturers Association
SAE Society of Automotive Engineers
SAMA Scientific Apparatus Makers Association
SBC Southern Building Code Congress International, Inc. (SBCCI)
SIS Swedish Standards Association
SIJ Steel Joist Institute
SMA Screen Manufacturers Association
SPR Simplified Practice Recommendation
SSBC Southern Standard Building Code, Southern Building Code Congress
SSPC Steel Structures Painting Council
SSPWC Standard Specifications for Public Works Construction
TAPPI Technical Association of the Pulp and Paper Industry
TFI The Fertilizer Institute
UBC Uniform Building Code
UL Underwriters Laboratories, Inc.
USGS United States Geological Survey
WCLIB West Coast Lumber Inspection Bureau
WCRSI Western Concrete Reinforcing Steel Institute
WIC Woodwork Institute of California
WPCF Water Pollution Control Federation
WRI Wire Reinforcement Institute, Inc.
WWPA Western Wood Products Association

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01152
APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Agreement between Owner and Contractor and the Contract Documents.

PART 2 - RELATED SECTIONS

A. Section 01050 – Field Engineering and Surveying
B. Section 01310 - Construction Schedules
C. Section 01370 - Schedule of Values
D. Section 01380 - Construction Photographs
E. Section 01700 - Contract Close Out
F. Section 01720 - Project Record Documents

2.02 FORMAT AND DATA REQUIRED

A. Submit applications typed on forms provided by the Owner (or forms provided by Contractor and agreed to by Owner), Application for Payment, with itemized data typed on 8 1/2 inch x 14 inch white paper and continuation sheets.

B. Payment forms shall show significant detail to substantiate request. Additional detail may be required by the Engineer.

2.03 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form:

1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.

2. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.

3. Execute certification with signature of a responsible officer of Contract firm.
B. Continuation Sheets:

1. Fill in total list of scheduled component items of work, with item number and scheduled dollar value for each item.
2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored.
   a. Round off values to nearest dollar, or as specified.
3. List each Change Order Number, and description, as for an original component item or work.

2.04 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:

1. Project
2. Application number and date
3. Detailed list of enclosures
4. For stored products:
   a. Item number and identification as shown on application.
   b. Description of specific material.
   c. Copy of material invoice.
   d. Address of location where item is stored
   e. Photographs of item (if requested)

B. Submit one copy of data cover letter for each copy of application.

C. As a prerequisite for payment, Contractor is to submit the following:

1. a "Surety Acknowledgment of Payment Request" letter showing amount of progress payment which the Contractor is requesting,
2. updated record drawings for review by the Engineer,
3. updated construction schedule for review by the Engineer,
4. construction photographs.

2.05 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application form as specified for progress payments.

B. Provide FINAL COMPLETION documentation for the final statement of accounting as specified in Section 01700 - Contract Closeout.
C. Submit final record drawings.

2.06 SUBMITTAL PROCEDURE

A. Submit Applications for Payment to the Engineer at the times stipulated in the Agreement.

B. When the Engineer finds Application properly completed and correct, he will transmit certificate of payment to Owner, with copy to Contractor.

PART 3 - PRODUCTS (NOT USED)

PART 4 - EXECUTION (NOT USED)

END OF SECTION
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PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall schedule and administer preconstruction meetings, periodic progress meetings, and specially called meetings throughout the progress of work. The Contractor shall:

1. Prepare agenda for meetings.
2. Make physical arrangements for meetings.
3. Preside at meetings.
4. Record in writing the minutes; include significant proceedings and decisions and submit to Engineer for approval prior to distribution.
5. Record the meeting with an audio recording device.
6. Reproduce and distribute copies of minutes within five working days after each meeting:
   a. To participants in the meeting.
   b. To parties affected by decisions made at the meeting.

B. Representatives of contractor, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

C. The Contractor shall attend meetings to assure that work is executed consistent with Contract Documents and construction schedules.

1.02 RELATED SECTIONS

A. Section 01310 - Construction Schedules.
B. Section 01340 - Shop Drawings, Working Drawings, and Samples.
C. Section 01720 - Project Record Documents.
D. Other Sections as applicable.

1.03 PRECONSTRUCTION MEETING

A. Schedule a preconstruction meeting no later than 15 days after date of Notice to Proceed.

B. Location: A central site, convenient for all parties designated by the Owner.
C. Attendance:

1. Owner's Representative.
2. Engineer and his Professional Consultants.
3. Resident Project Representative.
4. Contractor's Superintendent.
5. Major Subcontractors.
7. Utilities.
8. Others as appropriate.

D. Suggested Agenda:

1. Distribution and discussion of:
   a. List of major subcontractors and suppliers.
   b. Projected Construction Schedule.
2. Critical work sequencing/critical path scheduling.
3. Major equipment deliveries and priorities.
4. Project Coordination.
   a. Designation of responsible personnel.
5. Procedures and processing of:
   a. Field decisions.
   b. Proposal requests.
   c. Submittals.
   d. Change Orders.
   e. Applications for Payments.
7. Procedures for maintaining Record Documents.
8. Use of Premises:
   b. Owner's Requirements.
10. Temporary Utilities.
1.04 PROGRESS MEETINGS

A. The progress meetings will be held as required by progress of the work or as required by the Engineer or the Owner.

B. Hold called meetings as required by progress of the work.

C. Location of the meetings: Office of the Owner or Engineer.

D. Attendance:
   1. Engineer, and his professional consultants as needed.
   2. Subcontractors as appropriate to the agenda.
   3. Suppliers as appropriate to the agenda.
   4. Others as appropriate.

E. Suggested Agenda:
   1. Review, approval of minutes of previous meeting.
   2. Review of work progress since previous meeting.
   3. Field observations, problems and conflicts.
   4. Problems which impede Construction Schedule.
   5. Review of off site fabrication, delivery schedule.
   6. Corrective measures and procedures to regain projected schedule.
   7. Revisions to Construction Schedule.
   8. Progress, schedule, during succeeding work period.
   9. Coordination of schedules.
   10. Review submittal schedules; expedite as required.
   12. Pending changes and substitutions.
   13. Review proposed changes for:
       a. Effect on Construction Schedule and on a completion date.
       b. Effect on other contracts of the Project.
   14. Other business.
   15. Construction schedule.
   16. Critical/long lead items.

F. The Contractor is to attend progress meetings and is to study previous meeting minutes and current agenda items, in order to be prepared to discuss pertinent topics such as deliveries of materials and equipment, progress of work, etc.
G. The Contractor is to provide a current submittal log at each progress meeting in accordance with Section 01340.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.01 DESCRIPTION

A. Promptly after Award of the Contract and within ten days after the effective date of the Agreement, prepare and submit to the Engineer an estimated construction progress schedules for the work, with sub-schedules of related activities which are essential to its progress.

B. Submit revised progress schedules on a monthly basis.

C. No partial payments shall be approved by the Engineer until there is an approved up to date construction progress schedule on hand.

D. The Contractor shall designate an authorized representative of his firm who shall be responsible for development and maintenance of the schedule and of progress and payment reports. This representative of the Contractor shall have direct project control and complete authority to act on behalf of the Contractor’s schedule.

1.02 RELATED SECTIONS

A. Document 00700 – General Conditions of the Construction Contract

B. Section 01010 - Summary of Work

C. Section 01152 - Applications for Payment

D. Section 01200 - Project Meetings

E. Section 01340 - Shop Drawings, Working Drawings and Samples

F. Other Sections as applicable.

1.03 FORM OF SCHEDULES

A. Prepare schedules for submittal each month with pay request. The form of the schedule is to be Microsoft Project or approved equal. The Schedule is to indicate work completed to date and additions to or deletions from the schedule.

1. Provide separate horizontal bar for each trade or operation within each structure or item.

2. Horizontal time scale: In weeks from start of construction and identify the first work day of each month.

3. Scale and spacing: To allow space for notations and future revisions.
B. Format of listings: The chronological order of the start of each item of work for each structure.

C. Identification of listings: By major specification section numbers as applicable and structure.

1.04 CONTENT OF SCHEDULES

A. Construction Progress Schedule:

1. Show the complete sequence of construction by activity.

2. Show the dates for the beginning of, and completion of, each major element of construction in no more than a two-week increment scale. Specifically list, but not limited to:
   a. Receiving Materials
   b. Pipeline Installations
   c. Testing
   d. Restoration
   e. Startup
   f. Record Drawings
   g. Permit Close-out
   h. Punch List
   i. Owner Activities, Including Inspections

3. Show projected percentage of completion for each item, as of the first of each month.

4. Show projected dollar cash flow requirements for each month of construction.

5. Use of float suppression techniques such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times are prohibited, and use of float time disclosed or implied by use of alternate float-suppression techniques shall be shared to proportionate benefit of the Owner and Contractor.

6. Pursuant to above float-sharing requirement, no time extensions will be granted nor delay damages paid until a delay occurs which (i) impacts Project’s critical path, (ii) consumes available float or contingency time, and (iii) extends work beyond contract completion date.

7. If the Contractor provides an accepted schedule with an early completion date, the Owner reserves the right to reduce the duration of the work to match the early completion date by issuing a deductive Change Order at no
change in Contract Price.

B. Submittal Schedule for Shop Drawings and Samples in accordance with Section 01340. Must show:

1. The dates for Contractor’s submittals.
2. The dates submittals will be required for owner furnished products, if applicable.
3. The dates approved submittals will be required from the Engineer.

C. A list of all long lead items (equipment, materials, etc).

1.05 PROGRESS REVISIONS

A. Indicate progress of each activity to date of submission.

B. Show changes occurring since previous submission of schedule:

1. Major changes in scope.
2. Activities modified since previous submission.
3. Revised projections of progress and completion.
4. Other identifiable changes.

C. Provide a narrative report as needed to define:

1. Problem areas, anticipated delays, and the impact on the schedule.
2. Corrective action recommended, and its effect.
3. The effect of changes on schedules of other prime contractors.

1.06 SUBMISSIONS

A. Submit initial schedules to the Engineer within 10 days after the effective date of the Agreement.

1. The Engineer will review schedules and return review copy within 21 days after receipt.
2. If required, resubmit within 7 days after return of review copy.

B. Submit a minimum of five (5) copies of revised monthly progress schedules with that month's application for payment.

1.07 DISTRIBUTION

A. Distribute copies of reviewed schedules to:

1. Owner (Two copies)
2. Engineer (Two copies)
3. Job Site File (One copy)
4. Subcontractors (As needed)
5. Other Concerned Parties (As needed)

B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedule.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01340

SHOP DRAWINGS, WORKING DRAWINGS AND SAMPLES

PART 1 - GENERAL

1.01 DESCRIPTION

A. The contractor shall submit to the Engineer for review, such working drawings, shop drawings, test reports and data on materials and equipment (hereinafter in this article called data), and material samples (hereinafter in this article called samples) as are required for the proper control of work, including but not limited to those working drawings, shop drawings, data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.

B. The Contractor shall submit five (5) copies of shop drawings or other data to the Engineer.

C. Within thirty (30) calendar days after the effective date of the Agreement, the Contractor shall submit to the Engineer a complete list of preliminary data for which Shop Drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specific items. Review of this list by the Engineer shall in no way expressed or implied relieve the Contractor from submitting complete Shop Drawings and providing materials, equipment, etc., fully in accordance with the Specifications. This procedure is required in order to expedite final review of Shop Drawings.

D. The contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the Owner and Engineer. This log should include the following items:

1. Submittal-Description and Number assigned.
2. Date to Engineer.
3. Date returned to Contractor (from Engineer).
5. Date of Resubmittal and Return (as applicable).
6. Date material released (for fabrication).
7. Projected date of fabrication.
8. Projected date of delivery to site.

1.02 RELATED SECTIONS

A. Section 01310 - Construction Schedules

B. Section 01720 - Project Record Documents
C. Section 01730 - Operating and Maintenance Data

D. Other Sections as applicable.

1.03 CONTRACTOR’S RESPONSIBILITY

A. It is the duty of the Contractor to check all drawings, data and samples prepared by or for him before submitting them to the Engineer for review. Each and every copy of the Drawings and data shall bear Contractor’s stamp will be returned to the Contractor for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents.

B. Determine and verify:
   1. Field measurements
   2. Field construction criteria
   3. Catalog numbers and similar data
   4. Conformance and Specifications

C. The Contractor shall furnish the Engineer a schedule of Shop Drawing submittals fixing the respective dates for the submission of shop and working drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.

D. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed Shop Drawings, Working Drawings and Samples will be needed.

E. The Contractor shall not begin any of the work covered by a drawing, data, or a sample returned for correction until a revision or correction thereof has been reviewed and returned to him, approved by the Engineer.

F. The Contractor shall submit to the Engineer all shop drawings, working drawings and samples sufficiently in advance of construction requirements and shall account for Engineers Shop Drawing review time accordingly.

G. The Contractor shall submit two (2) copies of descriptive or product data submittals to complement shop drawings for the Engineer plus the number of copies which the Contractor requires. The Engineer will retain two (2) sets. All blueprint shop drawings shall be submitted with one (1) set of reproducible and four (4) sets of print. The Engineer will review the drawings and return to the Contractor the set of marked-up drawings with appropriate review comments.

H. The Contractor shall be responsible for and bear all cost of damages which may result from the ordering of any material or from proceeding with any part of work prior to the review and Approval by Engineer of the necessary Shop Drawings.
ENGINEER'S REVIEW OF SHOP DRAWINGS

A. The Engineer's review of drawings, data and samples submitted by the Contractor will cover only general conformity to the Specifications, external connections, and dimensions which affect the installation. The Engineer's review and exception if any, will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown.

B. The review of drawings and schedules will be general, and shall not be construed:

1. as permitting any departure from the Contract requirements;
2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.

C. If the drawings or schedule as submitted describe variations and/or show a departure from the Contract requirements which Engineers finds to be in the interest of the Owner and to be minor as not to involve a change in the Contract Price or time for performance, the Engineer may return the reviewed drawings without noting an exception.

D. When reviewed by the Engineer, each of the Shop Drawings will be identified as having received such review being so stamped and dated. Shop Drawings stamped "REJECTED" and with required corrections shown will be returned to the Contractor for correction and resubmittal.

E. Resubmittals will be handled in the same manner as the first submittals. On resubmittals, the Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by the Engineer on previous submissions. The Contractor shall make any corrections required by the Engineer.

F. If the Contractor considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the Contractor shall give written notice thereof to the Engineer.

G. The Engineer will review one submittal and one re-submittal after which cost of review will be borne by the Contractor. The cost of Engineering shall be equal to the Engineer's charges to the Owner under the terms of the Engineer's agreement with the Owner.

H. When the Shop Drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

I. No partial submittals will be reviewed. Submittals not complete will be returned to the Contractor, and will not be considered "Rejected" until resubmitted.
J. The Engineer shall return Shop Drawing submittals to the Contractor within twenty-one (21) days calendar days from the date the Engineer receives them.

1.05 SHOP DRAWINGS

A. When used in the Contract Documents, the term "Shop Drawings" shall be considered to mean Contractor's plans for material and equipment which become an integral part of the Project. These drawings shall be complete and detailed. Shop Drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature, and performance and test data, shall be considered only as supportive to required Shop Drawings as defined above.

B. Drawings and schedules shall be checked and coordinated with work of all trades involved, before they are submitted for review by the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.

C. Each Shop Drawing, shall have a blank area 3 1/2 inches by 3 1/2 inches, located adjacent to the title block. The title block shall display the following:

1. Number and title of the drawing.
2. Date of drawing or revision.
3. Name of project building or facility.
4. Name of contractor and subcontractor submitting drawing.
5. Clear identification of contents and location of work.

D. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed.

E. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent data.

F. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, address and telephone number of the manufacturer's representative and service company so that service and spare parts can be readily obtained. In addition, a maintenance and lubrication schedule for each piece of equipment shall be submitted along with each shop drawing submittal.
G. All manufacturers or equipment supplier who proposes to furnish equipment or products under Divisions 11, 12, 13, 14, 15 and 16 shall submit an installation list to the Engineer along with the required shop drawings. The installation list shall include at least five installations where identical equipment has been installed and has been in operation for a period of at least five (5) years.

H. Only the Engineer will utilize the color "red" in marking Shop Drawing submittals.

I. Before final payment is made, the Contractor shall furnish to Engineer two (2) sets of record shop drawings all clearly revised, complete and up to date showing the permanent construction as actually made for all reinforcing and structural steel, miscellaneous metals, process and mechanical equipment, piping, electrical system and instrumentation system.

1.06 WORKING DRAWINGS

A. When used in the Contract Documents, the term "working drawings" shall be considered to mean the Contractor’s plans for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and false-work; for underpinning; and for such other work as may be required for construction, but does not become an integral part of the project.

B. Copies of working drawings as noted in subparagraph 1.06A above, shall be submitted to the Engineer where required by the Contract Documents or requested by the Engineer, and shall be submitted at least thirty (30) calendar days (unless otherwise specified by the Engineer) in advance of their being required for work.

C. Working drawings shall be signed by a Registered Professional Engineer, currently licensed to practice in the State of Florida and shall convey, or be accompanied by, calculation or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Prior to commencing such work, working drawings must have been reviewed without specific exceptions by the Engineer, which review will be for general conformance and will not relieve the Contractor in any way from his responsibility with regard to the fulfillment of the terms of the Contract. The Contractor assumes all risks of error; the Owner and Engineer shall have no responsibility therefore.

1.07 SAMPLES

A. The Contractor shall furnish, for the approval of the Engineer, samples required by the Contract Documents or requested by the Engineer. Samples shall be delivered to the Engineer as specified or directed. The Contractor shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the Engineer.

B. Samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.
3. A minimum of two samples of each item shall be submitted.

C. Each sample shall have a label indicating

1. Name of Project
2. Name of Contractor and Subcontractor
3. Material or Equipment Represented
4. Place of Origin
5. Name of Producer and Brand (if any)
6. Location in Project

(Samples of finished materials shall have additional marking that will identify them under the finished schedules.)

D. The Contractor shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required in subparagraph 1.07B above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the Engineer. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.

E. Approved samples not destroyed in testing shall be sent to the Engineer or stored at the site of the work. Approved samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the approved samples. Samples which failed testing or were not approved will be returned to the Contractor at his expense, if so requested at time of submission.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.01 DESCRIPTION

A. Submit to the Engineer a Schedule of Values allocated to the various portions of the Work, within 10 days after the effective date of the Agreement.

B. The Contractors Schedule of Values shall include all items listed in Section 01012 – Measurement and Payment, Part 3.

C. Once approved, the Schedule of Values shall be used as the basis for the Contractor’s Applications for Payment.

1.02 RELATED SECTIONS

A. Section 01152 - Applications for Payment

B. Other Sections as applicable.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

A. Present schedule on an 8-1/2 inch x 11 inch white paper; Contractor’s standard forms and automated printout will be considered for approval by the Engineer upon Contractor’s request. Identify schedule with:

1. Title of Project and location
2. Engineer and Project number
3. Name and Address of Contractor
4. Contract designation
5. Date of submission

B. Schedule shall list the installed value of the component parts to include individual equipment, piping, electrical, paving, of the Work (as required) in sufficient detail to serve as a basis for computing values for progress payments during construction and for additions and deletions to the Work.

C. For the various portions of the Work:

1. Each item shall include a directly proportional amount of the Contractor’s overhead and profit.

D. The sum of all values listed in the schedule shall equal the total Contract Sum.
1.04 ENGINEERS APPROVAL

A. The Schedule of Values is subject to the Engineer’s approval.
   1. Additional line item detail may be required.
   2. Supporting information may be required.
   3. Additional comparison trade bids may be required.

PART 2 - PRODUCTS (NOT USED)

PART 3 - PRODUCTS (NOT USED)

END OF SECTION
SECTION 01380
CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall employ a professional photographer to take digital construction record photographs for pre-construction conditions periodically during course of Work and post-construction.

1.02 RELATED SECTIONS

A. Section 01152 - Application for Payment
B. Section 01720 - Project Record Documents
C. Other Sections as applicable.

1.03 PHOTOGRAPHY REQUIRED

A. View and Quantities Required:

1. Take a minimum of 24 images of the site and adjacent property at the following intervals:
   a. Pre-construction
   b. Monthly, or other interval, at the cut-off date in accordance with Applications for Payment.
   c. At construction events or discoveries as directed by the Owner or Engineer.
   d. At post-construction.

B. Aerial photography shall be required in addition to ground level images for items out of sight of ground level photography.

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

D. At successive periods of photography, take at least one photograph from the same overall view as previously.

E. Consult with the Owner and Engineer at each period of photography for instructions concerning views required.
PART 2 - PRODUCTS

2.01 CAMERA REQUIREMENT
   A. A Digital Single Lens Reflex (DLSR) is required.
   B. Point and shoot, mobile phones and disposal cameras are not acceptable.

2.02 PHOTOGRAPHS
   A. The minimum file size is 6.0 megapixels per image.
   B. All images shall be color and in RGB format.
   C. Acceptable file formats include:
      1. Tagged Information File Format (TIFF)
      3. Digital Negative (DGN)
   D. Unacceptable file formats include:
      1. Bitmap (BMP)
      2. Graphics Interchange Format (GIF)
      3. Portable Network Graphic (PNG)
      4. RAW format.

2.03 METADATA
   A. Each image must contain descriptive metadata as follows:
      a. Name of Project
      b. Orientation of View
      c. Date and time of image
      d. Name and address of photographer
      e. Photographer's numbered identification of image.
      f. Meaningful and descriptive filenames unique to each image.

2.04 COPYRIGHT
   A. No copyrighted photographs will be accepted.
2.05 EDITING
   A. Images shall not be edited in any way.

2.06 TECHNIQUE
   A. Factual presentation
   B. Magnification commensurate with the level of detail required.
   C. Correct image and focus
      1. High resolution and sharpness
      2. Maximum depth-of-field
      3. Minimum distortion

2.07 DELIVERY OF IMAGES
   A. Deliver electronic image file to the Owner and Engineer to accompany each Application for Payment or as directed.
   B. Electronic file storage media shall be a durable, commercial quality USB memory device of sufficient capacity to store the intended contents.
   C. Electronic file storage media shall be labeled and identified by project title and project number.
   D. The photographer shall keep electronic copies for a minimum of two years from Owner acceptance.

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.01 DESCRIPTION
A. The Contractor shall provide a continuous color video with audio of the entire project prior to construction and at Owner acceptance.

1.02 RELATED SECTIONS
A. As applicable.

1.03 SCHEDULE REQUIRED
A. Video recordings shall not be made more than 30 days prior to construction. No construction shall begin prior to review and approval of the videos by the Engineer and the Owner.
B. Videos not conforming to the Specifications shall be resubmitted at no additional charge.

1.04 PROFESSIONAL VIDEOGRAPHERS
A. The Contractor shall engage the services of a professional videographer. The color audio-visual tapes shall be prepared by a responsible commercial firm known to be skilled and regularly engaged in the business of pre-construction color audio-visual documentation.

PART 2 - PRODUCTS

2.01 GENERAL
A. The finished product shall be a bright, sharp, clear picture free of distortion and show in sufficient detail acceptable to the Owner and Engineer.
B. All videos shall be color and in RGB format.
C. The Contractor shall furnish to the Engineer and the Owner two (2) copies each of the electronic file, which becomes a project record document.
D. Electronic file storage media shall be a durable, commercial quality USB memory device or compact disc of sufficient capacity to store the intended contents.
E. Electronic file storage media shall be labeled and identified by project title and project number.
F. The videographer shall keep electronic copies for a minimum of two years from Owner acceptance.

2.02 METADATA

A. Each video must contain descriptive metadata as follows:
   a. Name of Project
   b. Direction and road names
   c. Date and time of image
   d. Name and address of videographer
   e. Meaningful and descriptive filenames unique to each image.

2.03 COPYRIGHT

A. No copyrighted videos will be accepted.

2.04 EDITING

A. Videos shall not be edited in any way.

PART 3 - EXECUTION

A. The video recording shall show all surface features located within the construction zone. These features shall include, but not be limited to, roadways, sidewalks, outside of houses (front and sides), driveways, culverts, walls, fences and landscaping.

B. Where station numbering is used, coverage shall begin at the lowest station number and be continuous until the highest station number is reached. Otherwise, the entire length of the project shall be documented including each plan sheet.

C. Provide magnification (zoom) where appropriate to properly display details germane to the subject matter.

D. Maintain camera speed slow enough to achieve detail acceptable to the Owner and Engineer.
   1. Videos with unacceptable camera speed will not be accepted.
   2. Videographer shall be responsible to meet all traffic laws at the time of video including all necessary and appropriate safety measures.

END OF SECTION
SECTION 01400
QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION
A. This Section describes the Contractor’s minimum responsibilities in meeting the quality requirements of the Contract Documents.

1.02 RELATED SECTIONS
A. Section 01050 – Field Engineering and Surveying
B. Section 01410 – Materials and Installation Testing
C. Other Sections as applicable.

1.03 OBSERVATION AT PLACE OF MANUFACTURE
A. Unless otherwise specified, all products, materials, and time and equipment shall be subject to observation by the Owner and the Engineer at the place of manufacture.
B. The presence of the Owner and/or the Engineer at the place of manufacture however, shall not relieve the Contractor of the responsibility for furnishing products, materials, and equipment which comply with all requirements of the Contract Documents. Compliance is a duty of the Contractor.
C. The Contractor shall advise the Owner and Engineer promptly upon placing orders for materials and equipment so that arrangements may be made, if desired, for observation before shipment from the place of manufacture.
D. The Engineer may require the Contractor to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contractor Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the Owner shall be allowed on account of such testing and certification.

1.04 SAMPLING AND TESTING
A. Unless otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered.
B. The Owner and the Engineer reserve the right to use any generally accepted system of sampling and testing which will insure the quality of the workmanship is in full accord with the Contract Documents.

C. Any waiver by the Owner or Engineer of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial Work, shall not be construed as a waiver of any requirements.

D. The Owner and Engineer reserve the right to make independent investigations and tests at any time.

E. Failure of any portion of the Work to meet any of the requirements of the Contract Document shall be reasonable cause for the Owner or Engineer to require the removal or correction and reconstruction of any such Work at the cost of the Contractor.

1.05 SITE INVESTIGATION AND CONTROL

A. The Contractor shall verify all dimensions in the field and shall check field conditions continuously during construction. The Contractor shall be solely responsible for any inaccuracies built into the Work due to its failure to comply with this requirement.

B. The Contractor shall inspect related and appurtenant work, and shall report in writing to the Owner and Engineer any conditions that will prevent proper completion of the Work. Failure to report any such conditions shall constitute acceptance of all site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the Contractor at its cost.

1.06 OBSERVATION AND TESTING

A. The work or actions of the testing laboratory shall in no way relieve the Contractor of its obligations under the Contract. The laboratory testing work will include such observations and testing required by the Owner or Engineer. The testing laboratory will have no authority to change the requirements of the Contract Documents, nor perform, accept or approve any of the Contractor's Work.

B. The Contractor shall allow the Owner and Engineer ample time and opportunity for field observation and testing materials and equipment to be used in the Work.

C. The Contractor shall at all times furnish the Owner and the Engineer facilities, including labor, and allow proper time for inspecting and testing materials, equipment, and workmanship.
D. The Contractor must anticipate that possible delays may occur in the execution of its work due to the necessity of materials and equipment being inspected and accepted for use.

E. The Contractor shall furnish, at its own expense, all samples of materials required by the Owner or Engineer for testing, and shall make its own arrangements for providing water, electric power, or fuel for the various observations and tests of structures and equipment.

1.07 RIGHT OF REJECTION

A. The Owner and Engineer, shall have the right, at all times and places, to reject any articles or materials to be furnished hereunder which, in any respect, fail to meet the requirements of the Contract Documents, regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the Work at the site.

B. If the Owner or its representative, through an oversight or otherwise, has accepted materials or work which is defective or which is contrary to the Contract Documents, such materials, no matter in what stage or condition of manufacture, delivery, or erection, may be subsequently rejected.

C. The Contractor shall promptly remove rejected articles or materials from the site of the Work after notification of rejection. All costs of removal and replacement of rejected articles or materials as specified herein shall be borne by the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 BUOYANCY

A. The CONTRACTOR shall be completely responsible for any tanks, pipelines, manholes, foundations or similar improvements that may become buoyant during the construction operations due to groundwater levels. Should there be any possibility of buoyancy, the Contractor shall take the necessary steps to prevent damage due to floating or flooding, and shall repair or replace said improvements at no additional cost.

3.02 DEVIATION FROM SPECIFICATIONS

A. If any part of a submittal deviates from the plans and specifications, it is up to the Contractor to indicate such deviation—in writing—to the Engineer, for determination as to acceptance of the deviation. If no deviation is submitted, it is assumed that the Contractor has fully and completely followed the plans and specifications, and that any discrepancy discovered during construction shall be corrected completely at the expense of the Contractor.
3.03  AMERICANS WITH DISABILITIES ACT (ADA)

A. The Contractor shall make every effort to ensure all concrete work including, but not limited to accessible sidewalks, routes, ramps and curb ramps is compliant with the ADA and Florida Building Code Accessibility.

B. Prior to and during concrete placement, the contractor shall verify the formwork for compliance. Any and all concrete work which is not compliant shall be removed and replaced at no cost to the Owner.

END OF SECTION
SECTION 01410
MATERIALS AND INSTALLATION TESTING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Contractor shall employ and pay for the services of an independent testing laboratory, approved by the Engineer, to perform materials and installation testing of the type and frequency specified in the Contract Documents including, but not limited to, Geotechnical Testing Services and concrete testing.

B. Geotechnical Testing Services shall include, but not be limited to, periodic site inspections, soil proctor tests, soil classification tests and soil densities or compaction tests.

C. The Engineer may, at any time, elect to have materials and equipment tested for conformity with the Contract Documents.

D. Contractor shall include cost of testing in the Contract Price.

E. Piping pressure test and bacteriological testing shall be in accordance with the applicable Section.

1.02 RELATED SECTIONS

A. Section 01050 – Field Engineering and Surveying

B. Section 15010 – Testing Piping Systems

C. Other Sections as applicable.

1.03 REFERENCES

A. FDOT Design Standards.

B. FDOT Standard Specifications for Road and Bridge Construction.

C. Broward County Traffic Engineering Division (BCTED) Minimum Standards and the BCTED Pavement Markings & Signs Detail Sheet.

1.04 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:

1. Release, revoke, alter or enlarge on requirements of Contract Documents

2. Approve or accept any portion of the Work

3. Perform any duties of the Contractor
PART 3 - EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITIES

A. Provide all testing required by the Contract Documents as well as laws, ordinances, rules, regulations, orders, or approvals of public authorities.

B. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract.

C. Cooperate with laboratory personnel, and provide access to Work and to Manufacturer's operations.

D. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.

E. Provide to the laboratory the preliminary design mix proposed to be used for concrete and other materials mixes which require control by the testing laboratory.

F. Furnish incidental labor and facilities:
   1. To provide access to Work to be tested
   2. To obtain and handle samples at the Project site or at the source of the product to be tested
   3. To facilitate inspections and tests
   4. For storage and curing of test samples

G. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
   1. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence.

H. Employ and pay for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling, and testing required for the Contractor's convenience.

I. If the Owner requests tests in addition to those specified in the contract, and if the test results indicate the material or equipment complies with the Contract Documents, the Owner shall pay for the cost of the testing laboratory. If the tests and any subsequent retests indicate the materials and equipment fail to meet the requirements of the Contract Documents, the Contractor may pay for the laboratory costs directly to the testing firm or the total of such costs shall be deducted from any payments due the Contractor.
J. The Contractor shall pay costs for additional trips to the project by the agency when scheduled times for tests and inspections are canceled and agency is not notified sufficiently in advance of cancellation to avoid the trip.

3.02 TESTING

A. The following types of tests and test frequencies are required. Copies of all reports are to be sent to the Engineer immediately upon availability.

1. Density tests for trench backfill at a minimum rate of one (1) test per 6” lift per 100 feet of trench, unless otherwise directed by the Engineer.

2. Density tests for subgrade compaction at a minimum rate of three (3) tests in 100 feet of roadway, unless otherwise directed by the Engineer.

3. Density tests for limerock base at a minimum rate of three (3) tests per day on each course of completed compacted base, unless otherwise directed by the Engineer.

4. Density test for roadway crossings at the rate of one test per lane per lift of compacted material, beginning one foot above the normal water table.

B. If in the opinion of the Engineer, suitable compaction has not been achieved around structures, density tests may be required.

C. Concrete compressive strength at the rate of three (3) cylinders per the lesser of 50 cubic yards or per day.

D. Should any test indicate that any portion of the materials or workmanship does not comply with these Specifications; a retest shall be performed at the Contractor’s expense. If the retest confirms the first test, that portion of the work shall be removed and replaced or reworked and retested at no additional cost to the Owner until satisfactory compliance is attained.

E. Testing in the County right-of-way shall meet the requirements of the Florida Department of Transportation.

END OF SECTION
SECTION 01505

CONTROL OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall furnish personnel and equipment which will be efficient, appropriate and a quantity large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the Proposal. If at any time such personnel appear to the Engineer to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character or increase the personnel and equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

1.02 RELATED SECTIONS

A. Section 01010 – Summary of Work
B. Section 01015 – General Requirements
C. Other Sections as applicable.

1.03 PIPE LOCATIONS

A. Pipeline shall be located substantially as indicated on the Drawings, but the Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons.

1.04 OBSTRUCTIONS

A. The attention of the Contractor is drawn to the fact that during digging at the Project site, the possibility exists of the Contractor encountering various water, sewer, gas, telephone, electrical, or other lines not shown on the Drawings. The Contractor shall exercise extreme care before and during digging to locate and flag these lines so as to avoid damage to the existing lines. Should damage occur to an existing line, the Contractor shall repair the line at no cost to the Owner.

B. The Contractor shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents.
C. The Contractor shall verify the exact locations and depths of all utilities shown and the Contractor shall make exploratory excavations of all utilities that may interfere with the work. All such exploratory excavations shall be performed as soon as practicable after award of the contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the Contractor's work. When such exploratory excavations show the utility location as shown to be in error, the Contractor shall so notify the Engineer.

D. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility. Test pits shall be dug at the Contractor's expense, as directed.

E. The Contractor shall protect all Underground Utilities and other improvements which may be impaired during construction operations. It shall be the Contractor's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

F. In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the Contractor, be notified by the Owner to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the Contractor shall notify the Engineer a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.

G. Where the proper completion of the work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is indicated, the Contractor shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the Engineer and the owner of the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.

H. Existing utility lines that are indicated or the locations of which are made known to the Contractor prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced by the Contractor at the Contractor’s expense. Sewer laterals are included.

I. All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement owner before being concealed by backfill or other work.
J. All power, telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and any other cables encountered along the line of the work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Engineer are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. The Contractor shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

1.05 OPEN EXCAVATIONS

A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access to private property during construction shall be removed when no longer required. The length of open trench will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such a limiting the length of open trench or prohibiting stacking excavated material in the street, and requiring that the trenches shall not remain open overnight.

B. The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.

1.06 TEST PITS

A. Test pits for the purpose of locating underground pipeline or structures in advance of the construction shall be excavated and backfilled by the Contractor at his cost at the direction of the Engineer. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the Engineers.

1.07 UTILITY CROSSINGS

A. It is intended that wherever existing utilities such as service lines must be crossed, deflection of the pipe within recommended limits and cover shall be used to satisfactorily clear the obstruction unless otherwise indicated on the Drawings. However, when in the opinion of the Engineer or the Owner this procedure is not feasible he may direct the use of fittings.

1.08 SANITATION

A. Toilet Facilities - Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Part 1926 of the OSHA Standards for Construction.
B. Sanitary and Other Organic Wastes - The Contractor shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of away from the site in a manner satisfactory to the Engineer and in accordance with all laws and regulations pertaining thereto.

1.09 RELOCATIONS

A. The Contractor shall be responsible for the relocation of structures, including but not limited to light poles, signs, sign poles, fences, piping, conduits and drains that interfere with the positioning of the work as set out on the Drawings. The cost of all such relocations shall be included in the bid for the project and shall not result in any additional cost to the Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 COOPERATION WITHIN THIS CONTRACT

A. All firms or persons authorized to perform any work under this Contract shall cooperate with the General Contractor and his subcontractors or trades, and shall assist in incorporating the work of other trades where necessary or required.

B. Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or directed by the Engineer.

3.02 PROTECTION OF CONSTRUCTION AND EQUIPMENT

A. All newly constructed work shall be carefully protected from injury in any way. No wheeling or walking or placing of heavy loads on it shall be allowed and all portions injured shall be reconstructed by the Contractor at his own expense.

B. Further, the Contractor shall take all necessary precaution to prevent damage to any structure due to water pressure during and after construction and until such structure is accepted and taken over by the Owner.

3.03 PRIVATE LAND

A. The Contractor shall not enter or occupy private land outside of easements, except by written permission of the land owner.

3.04 RESTORATION

A. Temporary restoration shall be completed within five days of pipe installation. Temporary restoration shall include all driveways, sidewalks and roadways. They shall be swept clean and be maintained free of dirt and dust. All areas disturbed by the construction activities shall be restored to proper grade, cleaned up, including
the removal of debris, trash, and deleterious materials. All construction materials, supplies, or equipment, including piles of debris shall be removed from the area. All temporarily restored areas shall be maintained by the Contractor. These areas shall be kept clean and neat, free of dust and dirt, until final restoration operations are completed. The Contractor is responsible to utilize dust abatement operations in the temporarily restored areas as required, to the satisfaction of the Engineer.

B. Wherever sidewalks or private roads have been removed for purposes of construction, the Contractor shall place suitable temporary sidewalks or roadways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions before proceeding with the final restoration or, if no such period of times is so fixed, the Contractor shall maintain said temporary sidewalks or roadways until the final restoration thereof has been made.

C. Final restoration shall be completed within thirty days of pipe acceptance. Final restoration shall include the completion of all required pavement replacement of roadways, driveways, curbs, gutters, sidewalks and other existing improvements disturbed by the construction; final grading, placement of sod, pavement marking, etc., all complete and finished, acceptable to the Engineer.

D. In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with the adjacent undisturbed pavement.

E. The Contractor shall test an installed section of pipeline within five calendar days from completion of the pipeline. A section of pipe is defined as a pipe section which can be isolated by valves for appurtenances is satisfactorily completed, the Contractor shall provide the Engineer with a "Schedule of Existing Facilities Restoration" which will be reviewed and be acceptable to the Engineer. The schedule shall show the existing facilities to be restored and schedule of beginning and completion dates for each item of restoration. The work for completing the final restoration of existing facilities for a tested section of work shall be completed within 30 days of acceptance of the pipeline testing.

END OF SECTION
SECTION 01510
TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 DESCRIPTION
   A. Furnish, install and maintain temporary utilities required for construction, remove on completion of work.
   B. Pay all fees associated with temporary utilities including water consumption charges.

1.02 RELATED SECTIONS
   A. Section 01010: Summary of Work
   B. Other Sections as applicable.

1.03 REQUIREMENTS OF REGULATORY AGENCIES
   A. Comply with National Electric Code.
   B. Comply with Federal, State and Local codes and regulations and with utility company requirements.
   C. Comply with County Health Department and Environmental Regulations.

PART 2 - PRODUCTS

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

2.02 TEMPORARY ELECTRICITY AND LIGHTING
   A. Arrange with utility company, provide service required for power and lighting, and pay all costs for service and for power used in the construction, testing and trial operation prior to final acceptance of the work by the Owner.
   B. Install circuit and branch wiring, with the area distribution boxes located so that power and lighting is available throughout the construction by the use of construction type power cords.
   C. Provide adequate artificial lighting for all areas of work when natural light is not adequate to work, and all areas accessible to the public.
2.03 TEMPORARY WATER

A. Arrange with the water utility provider to provide water for construction purposes.

B. Install branch piping with taps located so that water is available throughout the construction by the use of hoses.

C. Install at each and every connection to the Owner water supply a backflow preventer meeting the requirements of ANSI A40.6 and AWWA C511. Contractor shall be required to meter and pay for all water used.

2.04 TEMPORARY SANITARY FACILITIES

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

PART 3 - EXECUTION

3.01 GENERAL

A. Maintain and operate systems to assure continuous service.

B. Modify and extend systems as work progress requires.

3.02 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

C. Restore permanent facilities used for temporary services to specified condition.

END OF SECTION
SECTION 01530
EXISTING UTILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section provides for specifications related to construction in the vicinity of existing utilities.

1.02 RELATED SECTIONS

A. Section 01010 – Summary of Work
B. Section 01015 – General Requirements
C. Other Sections as applicable.

1.03 CONTRACTOR RESPONSIBILITIES

A. The term existing utilities shall be deemed to refer to both publicly-owned and privately-owned utilities including, but not limited to, electric power and lighting, telephone, water, gas, storm drains, process lines, sanitary sewers and all appurtenant structures.

B. Prior to underground construction, the Contractor is required by the Underground Facility Damage Prevention and Safety Act, Chapter 556 FS to contact Sunshine 811, for the location of underground utilities.

C. Where existing utilities and structures are indicated in the Contract Documents, it shall be understood that all of the existing utilities and structures affecting the work may not be shown and that the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.

1.04 NOTIFICATION OF UTILITY OWNER

A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way the Contractor shall notify the respective authorities representing the owners or agencies responsible for such facilities not less than three days nor more than seven days prior to excavation so that a representative may be present during such excavation.
1.05 RIGHT-OF-WAY'S

A. The Contractor shall not do any work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; or any other structure, nor shall the Contractor enter upon the rights-of-way involved until notified by the Engineer that the Owner has secured authority therefore from the proper party. After authority has been obtained, the Contractor shall give said party due notice of its intention to begin work, if required by said party, and shall remove, shore, support, or otherwise protect such pipeline, transmission line, ditch, fence, or structure or replace the same. When two or more contracts are being executed at one time on the same or adjacent land in such manner that work on one contract may interfere with that on another, the Owner shall determine the sequence and order of the work. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the Owner to the Contractor so desiring, to the extent and amount, and in the manner and at the times permitted. No such decision as to the method or time of conducting the work or the use of territory shall be made the basis of any claim for delay or damage.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 TEMPORARY CONNECTIONS

A. The work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Temporary connections shall be provided, as required, to insure no interruption of existing services. Any damage resulting from the work of this Contract shall be promptly repaired by the Contractor at his own expense in a manner approved by the Engineer and further subject to the requirements of any authority having jurisdiction. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all costs thereof.

3.02 UTILITY SUPPORT

A. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the Contractor. All such work shall be performed in a manner satisfactory to the respective authority having jurisdiction over such work.

3.03 UTILITY CROSSINGS

A. It is intended that wherever existing utilities such as water, chemical, electrical, or other service lines must be crossed, deflection of the pipe within limits recommended by the pipe manufacturer and the required minimum cover shall be used to satisfactorily clear the obstruction unless otherwise indicated on the Drawings. However, when, in the opinion of the Owner or Engineer, this procedure
is not feasible the Engineer may direct the use of fittings for a utility crossing as detailed on the Drawings. All existing utilities shall be pothole located prior to construction of conflicting piping.

3.04 ADVANCE INVESTIGATIONS

A. The Contractor shall be responsible for uncovering and exposing existing utilities sufficiently in advance of pipe laying operations to confirm elevation, size, material and clearance separation(s). If, upon excavation, an existing utility is found to be in conflict with the proposed construction or be of a size or material different from what is shown on the plans, the Contractor shall immediately notify the Engineer, who will in turn prepare a recommendation. Failure of the Contractor to perform the advance investigation shall not relieve it of any claims for delay or damages.

3.05 UNFORESEEN UTILITIES

A. The attention of the Contractor is drawn to the fact that during excavation, the possibility exists of encountering water, sewer, petroleum, gas, telephone, electrical, or other utilities not shown on the Drawings. The Contractor is responsible for obtaining utility locations from the utility owners or utility locating company. The Contractor shall exercise extreme care before and during digging to locate and flag these lines so as to avoid damage to the existing lines. Should damage occur to an existing line, the Contractor shall repair the line at the no cost to the Owner.

3.06 CONNECTIONS TO EXISTING SYSTEMS

A. The Contractor shall perform all work necessary to locate, excavate, and prepare for connections to the terminus of the existing mains all as shown on the Drawings or where directed by the Owner. The cost of this work and the cost for the actual connection to the existing mains shall be included in the bid price as a separate item and shall not result in any additional cost to the Owner.

3.07 MAINTENANCE OF EXISTING STORM WATER FACILITIES OPERATION

A. The Contractor shall take notice that existing storm water pump station is operated in the construction area. It is the responsibility of the Contractor to contact the Owner's utility operator and ascertain the extent of any specific service area.

B. The Contractor shall fully cooperate at all times with the Owner in order to maintain the operation of the existing facilities with the least amount of interference and interruption possible. Continuous service, public health, and safety considerations shall exceed all others and the Contractor's schedule, plans, and work shall at all times be subject to alteration and revision, if necessary, for the above considerations.

C. The Engineer and Owner reserve the right to require the Contractor to work 24 hours per day in all cases where, in their opinion, interference with operation of the system may result.
D. In no case will the Contractor be permitted to interfere with the existing system until all materials, supplies, equipment, tools, and incidentals necessary to complete the interfering portion of the work are on the site, or a temporary by-pass system is effectively in place. All existing utilities shall be pothole located prior to construction of conflicting piping.

E. The Contractor shall provide emergency storm drainage pumping as specified in the Contract Documents.

3.08 RESTORATION OF PAVEMENT

A. General: All paved areas including concrete, asphaltic concrete, berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents. All pavements which are subject to partial removal shall be neatly saw-cut in straight lines.

B. Temporary Resurfacing: Wherever required by the public authorities having jurisdiction, the CONTRACTOR shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.

C. Permanent Resurfacing: In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw-cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

END OF SECTION
SECTION 01531

PROTECTION OF EXISTING PROPERTY

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this project. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.

B. In the event of any claims for damage or alleged damage to property as a result of work, the Contractor shall be responsible for all costs in connection with the settlement of or defense against such claims. Prior to commencement of work in the vicinity of property adjacent to the work site, the Contractor, at his own expense, shall take such surveys as may be necessary to establish the existing condition of the property. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

1.01 RELATED SECTIONS

A. Section 01015 – General Requirements
B. Section 01570 – Traffic Regulation
C. Other Sections as applicable.

1.02 PRESERVATION AND RESTORATION

A. Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this project. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.

1.03 ADJACENT PROPERTY OWNER NOTIFICATION

A. The Contractor shall prepare a written notice to property owners adjacent to the project work site notifying them of the schedule of work affecting them and anticipated inconveniences they may expect. The notice shall meet the approval of the Engineer and be delivered to property owners at least 72 hours prior to construction adjacent to their property. This notice shall indicate the work to be
performed, the time it will take to perform the work, and the time when the water service to the property owner will be disrupted.

1.04 PROTECTION OF STREET OR ROADWAY MARKERS

A. The Contractor shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced for easy and accurate restoration. It shall be the Contractor’s responsibility to notify the proper representatives of the Owner of the time and location that work will be done. Such notification shall be sufficiently in advance of construction so that there will be no delay due to waiting for survey points to be satisfactorily referenced for restoration. All survey markers or points disturbed by the Contractor without proper authorization by the Engineer will be accurately restored by the Owner at the Contractor’s expense after all street or roadway resurfacing has been completed.

1.05 BARRICADES, WARNING SIGNS AND LIGHTS

A. In addition to the requirements of Section 01570 – Traffic Regulation, the Contractor shall provide, erect and maintain as necessary, strong and suitable barricades, danger signs and warning lights for the preservation and protection of property adjacent to the work site. All barricades and obstructions along public roads shall be illuminated at night and all lights for this purpose shall be kept burning from sunset to sunrise.

1.06 TREES AND LANDSCAPING PROTECTION

A. General: The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or landscaping in or near the project site, and shall not trim or remove any trees or landscaping unless such trees or landscaping have been approved for trimming or removal by the jurisdictional agency or owner. All existing trees or landscaping which are damaged during construction shall be replaced by the Contractor or a certified tree/landscaping company to the satisfaction of the owner.

B. Replacement: The Contractor shall immediately notify the jurisdictional agency or owner if any tree or landscaping is damaged by the Contractor's operations. If, in the opinion of the jurisdictional agency or owner, the damage is such that replacement is necessary, the Contractor shall replace the tree or landscaping at its own expense. The tree or landscaping shall be of a like size and variety as the tree or landscaping damaged, or, if of a smaller size, the Contractor shall pay any compensatory payment.

C. All permit fees associated with the removal and replacement of trees and landscaping damaged or destroyed shall be the responsibility of the Contractor.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01540
SECURITY

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section provides for requirements of security, entry control, personnel identification and miscellaneous restrictions.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Other Sections as applicable.

1.03 SECURITY PROGRAM

A. Protect Work, existing premises and Owner’s operations from theft, vandalism and unauthorized entry.
B. Initiate program in coordination with Owner's existing security system at job mobilization.
C. Maintain program throughout construction period until Owner occupancy as directed by Engineer.

1.04 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into project site and existing facilities.
B. Allow entrance only to authorized persons with proper identification.
C. Maintain log of workmen and visitors, make available to Owner on request.
D. Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

1.05 PERSONNEL IDENTIFICATION

A. All personnel shall wear clothing bearing the company information of which they are employed.
B. Provide additional security as required by the Owner.
C. Become familiar with Owner and Engineer representatives and restrict access to job site to these representatives.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01550
SITE ACCESS AND STORAGE

PART 1 - GENERAL

1.01 GENERAL
A. This section provides general specifications for the contractors’ mobilization, de-
mobilization, access to the site and limitations on storage or lay-down area.

1.02 RELATED SECTIONS
A. Section 01015 – General Requirements
B. Section 01505 – Control of Work
C. Other Sections as applicable.

1.03 REFERENCES
A. FDOT Standard Specifications for Road and Bridge Construction
B. FDOT Design Standards
C. Broward County Traffic Engineering Division (BCTED) Minimum Standards
D. Standards and Specifications of the allocable local municipality
E. The requirements of the Owner

1.04 HIGHWAY LIMITATIONS
A. The Contractor shall make his own investigation of the condition of available public
and private roads and of clearances, restrictions, bridge load limits, and other
limitations affecting transportation and ingress and egress to the site of the work.

1.05 CONTRACTOR'S WORK AND STORAGE AREA
A. Contractor’s work and storage area plan shall be submitted for Owners approval no
later than 30 days after NTP.
   1. Owner approval of the work are and storage plan is required prior to
      commencement.
   2. The limits of the Contractor's staging area and other applicable restrictions
      shall be subject to the local municipality.
B. The Contractor shall make his own arrangements and pay for any necessary off-site
storage or shop areas necessary for the proper execution of the work.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall set up construction facilities in a neat and orderly manner within designated areas and shall confine operations to work and storage areas.

3.02 RESTORATION

A. All areas disturbed by the construction activities shall be restored to proper grade, cleaned up, including the removal of debris, trash, and deleterious materials.

B. Temporary restoration shall include all driveways, sidewalks and roadways. They shall be swept clean and be maintained free of dirt and dust.

C. All construction materials, supplies, or equipment, including piles of debris shall be removed from the area.

D. All temporarily restored areas shall be maintained by the Contractor. These areas shall be kept clean and neat, free of dust and dirt, until final restoration operations are completed.

E. Temporary restoration shall be completed within five days of pipe installation or as specified.

F. The Contractor is responsible to utilize dust abatement operations in the temporarily restored areas as required, to the satisfaction of the Engineer.

G. Final restoration shall be completed within thirty days of pipe acceptance. Final restoration shall include the completion of all required pavement replacement of roadways, driveways, curbs, gutters, sidewalks and other existing improvements disturbed by the construction; final grading, placement of sod, pavement marking, etc., all complete and finished, acceptable to the Engineer.

H. In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with the adjacent undisturbed pavement.

3.03 DEMOBILIZATION

A. At the completion of Work the Contractor shall remove its personnel, equipment, and temporary facilities from the site in a timely manner. The Contractor shall also be responsible for transporting all unused materials belonging to the Owner to a
place of storage on site designated by the Owner and for removing from the site and disposing of all other materials and debris resulting from the construction. It shall then return all areas used for its activities to a condition as recorded in the pre-construction video or better.

END OF SECTION
PART 1 - GENERAL

1.01 DESCRIPTION

A. The Work to be performed under this section shall include furnishing all materials and labor necessary to regulate vehicular and pedestrian traffic.

B. Provide, operate and maintain equipment, services and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow around the construction area.

C. Remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.

1.02 RELATED SECTIONS

A. Section 01015 – General Requirements

B. Section 01505 – Control of Work

C. Other Sections as applicable.

1.03 REFERENCES

A. The Work under this Contract shall be in strict accordance with the following codes and standards.

1. The applicable municipality

2. Broward County Traffic Engineering Division

3. Florida Department of Transportation Design Standards and Specifications

4. OSHA Safety and Health Standards for Construction.


6. Federal Highway Administration Traffic Controls for Street and Highway Construction and Maintenance Operations
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 MAINTENANCE OF TRAFFIC

A. For the maintenance and protection of vehicular and pedestrian traffic in public or private streets and ways, the Contractor shall provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights and other safety devices in accordance with the requirements of the "Manual of Uniform Traffic Control Devices, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations," published by U.S. Department of Transportation, Federal Highway Administration (ANSI D6.1).

B. The Contractor shall provide a Maintenance of Traffic Plan, sealed by a Professional Engineer registered in the State of Florida holding a current FDOT MOT certificate. The plan, and subsequent revisions, must be approved by the Broward County and/or the Florida Department of Transportation and the applicable local municipality.

C. The Contractor shall take all necessary precautions for the protection of the work and the safety of the public. All barricades and obstructions shall be illuminated at night, and all lights shall be kept burning from sunset until sunrise. The Contractor shall station such guards or flaggers and shall conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions. All signs, signals, and barricades shall conform to the requirements of OSHA and Subpart G, Part 1926, of the OSHA Safety and Health Standards for Construction.

D. The Contractor shall remove traffic control devices when no longer needed, shall repair all damage caused by installation of the devices, and shall remove post settings and backfill the resulting holes to match grade.

3.02 CORRECTIONS

A. Upon notification by the owner either verbally or in writing, the contractor shall correct any noted deficiencies within one hour.

B. Inspection of all traffic control items shall be accomplished at least twice per day. One of these inspections shall be at the end of the work day or at night.

3.03 TRAFFIC AND VEHICULAR ACCESS:

A. Emergency Vehicles: No single family residence, multi-family residence, apartment, commercial building or place of employment shall be without access to emergency vehicles for a period longer than three hours. The Contractor shall notify in writing the Engineer, the police, fire and other emergency departments and agencies when and where work is to be accomplished that will affect their operations at least two days in advance of such work.
B. Commercial Properties: Access to commercial property shall not be blocked for a period of more than 30 minutes during the time such properties are open for business.

C. Residential Property: Access to residential property shall not be blocked for a period of more than 4 hours.

3.04 ROAD CLOSURE

A. No roads shall be blocked to traffic without adequate detour facilities for a period of more than 30 minutes or as directed by the governing authority.

B. At least seven days prior to a proposed road closure, the contractor shall submit to the Town of Davie and the City of Hollywood a complete traffic control plan. This plan shall include the following minimum information:

1. Sketch of work site and all area roads, streets and mark driveways.
2. Proposed detour route.
3. All necessary traffic control devices to be used.
4. Emergency contractor contact person name and phone to be available 24 hours a day.
5. Estimated times/dates of road closure.

3.05 CONSTRUCTION IN OTHER THAN STATE HIGHWAY RIGHT-OF-WAY:

A. Construction within right-of-way other than State highway shall be made in full compliance with all requirements of the Florida Department of Transportation and to the satisfaction of the local governing bodies. All necessary barricades, detours, lights and other protective measures shall be provided for the protection of both pedestrian and vehicular traffic.

B. The Contractor shall provide and maintain such other warning signs and barricades in areas of and around their respective work as may be required for the safety of all those employed in the work or those visiting the site.

3.06 FLAGMEN

A. Provide qualified and suitably equipped flagmen when construction operations encroach on traffic lanes, as required for regulation of traffic.

3.07 FLARES AND LIGHTS

A. Provide lights as required to clearly delineate traffic lanes and to guide traffic as required.

B. Provide lights for use by flagmen in directing traffic.
C. Provide illumination of critical traffic and parking areas as required.

3.08 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.

B. Monitor parking of construction personnel's private vehicles.

C. Maintain free vehicular access to and through parking areas and driveways.

D. Prohibit parking on or adjacent to access roads, or in non-designated areas.

END OF SECTION
SECTION 01580
PROJECT IDENTIFICATION SIGNS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED
   A. Furnish, install and maintain one project identification sign.
   B. Remove sign upon completion of construction.
   C. Allow no other signs to be displayed without approval of Owner.

1.02 PROJECT IDENTIFICATION SIGN
   A. One painted or printed sign of size, design and lettering as shown on sample
      provided by Owner.
      1. Locate as directed by Owner.
      2. Colors as indicated.

1.03 QUALITY ASSURANCE
   A. Provide one electronic proof for Owner approval prior to release for printing or
      painting.

PART 2 - PRODUCTS

2.01 SIGN MATERIALS
   A. Structure and framing shall be pressure treated (2) 4”x4”x10’ posts.
   B. Foundation shall be two eighty pound bags of concrete per post.
   C. Sign Surfaces shall be exterior grade plywood 8 feet wide by 4 feet high with a
      minimum thickness of 5/8 inch.
   D. Rough Hardware: Galvanized
   E. Finishes and painting shall be adequate to resist weathering and fading for
      scheduled construction period.
PART 3 - EXECUTION

3.01 PROJECT IDENTIFICATION SIGN
   A. Paint exposed surfaces of supports, framing and surface material; one coat of primer and one coat of exterior paint.
   B. Paint graphics in styles, sizes and colors selected.
   C. Lettering shall be as noted.
   D. Logo shall be shown as directed by Owner.
   E. Background shall be white.

3.02 SIGN LOCATION
   A. Sign shall be located within the right of way or in an area approved by the Owner.

3.03 MAINTENANCE
   A. Maintain sign and supports in a neat, clean condition; repair damages to structure, framing or sign.
   B. Relocate sign as required by progress of the work.

3.04 REMOVAL
   A. Remove sign, framing, supports and foundations at completion of project or at direction of the Engineer.

END OF SECTION
PART 1 - GENERAL

1.01 DESCRIPTION

A. Material and equipment incorporated into the Work.
   1. Conform to applicable specifications and standards.
   2. Comply with size, make, and type and qualify specified, or as specifically approved in writing by the Engineer.
      a. Design, fabricate, and assemble in accord with the best Engineering and shop practices.
      b. Manufacture like part of duplicate units to standard sizes and gauges, to be interchangeable.
      c. Two or more items of the same kind shall be identical, by the same manufacturer.
      d. Products shall be suitable for service conditions.
      e. Equipment capacities, sizes, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
   4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.02 RELATED SECTIONS

A. Section 01340 - Shop Drawings, Product Data, and Samples
B. Section 01630 - Substitutions
C. Section 01720 - Project Record Documents
D. Other Sections as applicable.

1.03 APPROVAL OF MATERIALS

A. Only new materials and equipment shall be incorporated in the work. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the Engineer. No material shall be delivered to the work without prior approval of the Engineer.
B. Within 30 days after the effective date of the Agreement, the Contractor shall submit to the Engineer, data relating to materials and equipment he proposes to furnish for the work. Such data shall be in sufficient detail to enable the Engineer to identify the particular product and to form an opinion as to its conformity to the specifications. The data shall comply with Paragraph 1.08 of this Section.

C. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by the Contractor. If the Engineer requires, either prior to beginning or during progress of the work, the Contractor shall submit samples of materials for such special tests as may be necessary to demonstrate that they conform to the specifications. Such samples shall be furnished, stored, packed, and shipped as directed at the Contractor’s expense. Except as otherwise noted, the Owner will make arrangements for and pay for the tests.

D. The Contractor shall submit data and samples sufficiently early to permit work. Any delay of approval resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of claim against the Owner or the Engineer.

E. In order to demonstrate the proficiency of workmen or to facilitate the choice among several textures, types, finishes, and surfaces, the Contractor shall provide such samples of workmanship or finish as may be required.

F. The materials and equipment used on the work shall correspond to the approved samples or other data.

1.04 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instruction, obtain, and distribute copies of such instructions to parties involved in the installation, including copies to the Engineer.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.

2. Do not proceed with work without clear instructions.

C. Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.05 TRANSPORTATION AND HANDLING

A. Arrange deliveries of Products in accord with construction schedules; coordinate to avoid conflict with work and conditions at the site.
1. Deliver Products in undamaged condition, in manufacturer’s original containers or packaging, with identifying labels intact and legible.

2. Immediately upon delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that Products are properly protected and undamaged.

B. Provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.

1.06 STORAGE AND PROTECTION

A. The Contractor shall furnish a covered, weather-protected storage structure, providing a clean, dry, noncorrosive environment for all mechanical equipment, valves, electrical and instrumentation equipment, and special equipment to be incorporated into this project. Storage of equipment shall be performed to allow easy access and be in strict accordance with the "instructions for storage" of each equipment supplier and manufacturer including weather/humidity protection, connection of heaters, placing of storage lubricants in equipment, blocking, or skid storage, etc. Corroded, damaged, or deteriorated equipment and parts shall be replaced before acceptance of the project.

B. Store Products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather-tight enclosures.

2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

3. Store fabricated products above the ground, on blocking or skids, to prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings. Provide adequate ventilation to avoid condensation.

4. Store loose granular materials in a well drained area on solid surfaces to prevent mixing with foreign matter.

C. All materials and equipment to be incorporated in the work shall be handled and stored by the Contractor before, during, and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft or damage of any kind whatsoever to the material or equipment.

D. Cement, sand, and lime shall be stored under a roof, off the ground, and shall be kept completely dry at all times. All structural and miscellaneous steel and reinforcing steel shall be stored off the ground, or otherwise, to prevent accumulations of dirt or grease, and to minimize rusting. Brick, block, and similar masonry products shall be handled and stored in a manner to reduce breakage, chipping, cracking, and spalling to a minimum.
E. Moving parts shall be rotated a minimum of once weekly to insure proper lubrications, and to avoid metal-to-metal "welding". Upon installation of the equipment, the Contractor shall start the equipment, at least half-load, once weekly, for an adequate period of time to ensure that the equipment does not deteriorate from lack of use. All materials which, in the opinion of the Engineer, have become so damaged as to be unfit for the use intended or specified, shall be promptly removed from the site of the work, and the Contractor shall receive no compensation for the damaged material or its removal.

F. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored Products to assure that Products are maintained under specific conditions, and free from damage or deterioration.

G. Contractor shall be responsible for protection after installation by providing substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations.

H. The Contractor shall be responsible for all materials, equipment, and supplies sold and delivered to the Owner under this Contract, until final inspection of the work and acceptance thereof by the Owner. In the event any such material, equipment, and supplies are lost, stolen, damaged, or destroyed prior to final inspection and acceptance, the Contractor shall replace same without additional cost to the Owner.

I. Should the Contractor fail to take proper action on storage and handling of equipment supplied under this Contract within seven days after written notice to do so has been given, the Owner retains the right to correct all deficiencies noted in previously transmitted written notice and deduct the cost associated with these corrections from the Contractor’s Contract. These costs may be comprised of expenditures for labor, equipment usage, administrative, clerical, Engineering, and any other costs associated with making the necessary corrections.

1.07 SPECIAL TOOLS

A. Manufacturers of equipment and machinery shall furnish any special tools (including grease guns or other lubricating devices) required for normal adjustment, operations and maintenance, together with instructions for their use. The Contractor shall preserve and deliver to the Owner these tools and instructions in good order no later than upon completion of the Contract.

1.08 STORAGE AND HANDLING OF EQUIPMENT ON SITE

A. Because of the long period allowed for construction, special attention shall be given to the storage and handling of equipment on site. As a minimum, the procedure outlined below shall be followed.

1. Equipment shall not be shipped until approved by the Engineer. The intent of this requirement is to reduce on-site storage time prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from the Engineer, unless upon arrival it is to be stored as specified in Paragraph 1.06. Operation and maintenance data, as described
in Paragraph 1.08 of Section 01730 shall be submitted to the Engineer for review prior to shipment of equipment.

2. All equipment having moving parts, such as gears, electric motors, etc. and/or instruments, shall be stored in a temperature and humidity controlled building approved by the Engineer, until such time as the equipment is to be installed.

3. All equipment shall be stored fully lubricated with oil, grease, etc. unless otherwise instructed by the manufacturer.

4. Manufacturer's storage instructions shall be carefully studied by the Contractor and reviewed with the Engineer by him. These instructions shall be carefully followed and a written record of this kept by the Contractor.

5. Moving parts shall be rotated a minimum of once weekly to insure proper lubrication, and to avoid metal-to-metal "welding". Upon installation of the equipment, the Contractor shall start the equipment, at least half-load, once weekly for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.

6. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. Mechanical equipment to be used in the work, if stored for longer than ninety (90) days, shall have the bearings cleaned, flushed, and lubricated prior to testing and start up, at no extra cost to the Owner.

7. Prior to acceptance of the equipment, the Contractor shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested, and accepted in a minimum time period. As such, the manufacturer will guarantee the equipment equally in both instances. If such a certification is not given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.

1.09 WARRANTY

A. For all major pieces of equipment, submit a warranty from the equipment manufacturer as specified in Section 01740.

1.10 SPARE PARTS

A. Spare parts for certain equipment provided under Division 11 through 16 have been specified in the pertinent sections of the Specifications. The Contractor shall collect and store all spare parts so required in an area to be designated by the Engineer. In addition, the Contractor shall furnish to the Engineer an inventory listing all spare parts, the equipment they are associated with, the name and address of the supplier, and the delivered cost of each item. Copies of actual invoices for each item shall be furnished with the inventory to substantiate the delivered cost.
1.11 LUBRICANTS

A. During testing and prior to acceptance, the Contractor shall furnish all lubricants necessary for the proper lubrication of all equipment furnished under this Contract.

1.12 GREASE, OIL AND FUEL

A. All grease, oil, and fuel required for testing of equipment shall be furnished with the respective equipment. The Owner shall be furnished with a year's supply of required lubricants including grease and oil of the type recommended by the manufacturer with each item of the equipment supplied under Division 11 through 16.

B. The Contractor shall be responsible for changing the oil in all drives and intermediate drives of each mechanical equipment after initial break-in of the equipment, which in no event shall be any longer than three weeks of operation.

1.13 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other acceptable materials.

1.14 FASTENERS

A. All necessary bolts, anchor bolts, nuts, washers, plates and bolt sleeves shall be furnished by the Contractor. Bolts shall have suitable washers and, where so required, their nuts shall be hexagonal.

B. All bolts, anchor bolts, nuts, washers, plates, and bolt sleeves shall be Type 316 stainless steel unless otherwise specifically indicated or specified.

C. Fasteners of dis-similar metals shall be provided with nylon spacer washers.

D. Unless otherwise specified, stud, tap, and machine bolts shall be of the best quality refined bar iron. Hexagonal nuts of the same quality of metal as the bolts shall be used.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EQUIPMENT, TESTING & INSPECTION

A. Regardless of the number of days specified in the individual sections for the manufacturer's representative to be present on the site for inspection and testing, if the equipment fails to perform as specified, then the representative shall remain on site until the malfunction is corrected.
B. The cost for the additional days shall not be added to the cost for the Owner, but shall be to the account of the Contractor.

END OF SECTION
SECTION 01610
MANUFACTURERS FIELD SERVICES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Provide field services by manufacturer-trained personnel for the duration as specified in the individual equipment sections.

B. Person-Day: One person for 8 hours within regular Contractor working hours.

1.02 RELATED SECTIONS

A. Other Sections as applicable.

1.03 SUBMITTALS

A. Training Schedule:

1. Where specified, submit a training schedule not less than 21 days prior to start of equipment installation and revise as necessary for acceptance.

2. Training Materials:

a. Submit written outlines of proposed training sessions not less than 21 days prior to scheduled training.

b. Provide complete training materials, to include operation and maintenance data as required in this section to be retained by each trainee.

B. Quality Control Submittals:

1. Manufacturer's Certificate of Proper Installation:

a. When specified in the individual specifications, submit certificate certifying:

1) The product or system has been installed in accordance with the manufacturer's recommendations, inspected by manufacturer's authorized representative, and serviced with the proper lubricants.

2) Necessary safety equipment has been properly installed.

3) Electrical and mechanical connections have been made meeting quality and safety standards as required.

4) Free from undue stress imposed by exterior connections or loads.
Proper adjustments have been made and the product or system is ready for testing, facilities startup and operation.

b. Submit on form appended to this section.

2. Certificate of Successful Testing and Startup: Prepare and submit where specified in individual Specification sections, and upon completion of successful testing and startup of respective equipment system, subsystem or component.

3. Certificate of qualification of manufacturer’s representative.

1.04 QUALIFICATIONS OF MANUFACTURER’S REPRESENTATIVE

A. Authorized representative of the manufacturer, factory trained and experienced in technical applications, installation, operation and maintenance of respective equipment, subsystem, or system. Representative subject to acceptance by Owner and Engineer. No substitute representatives will be allowed unless prior written approval by the Engineer has been given.

1.05 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

A. Where manufacturers’ services are specified, furnish manufacturer’s representative qualified to provide these services. Where time is necessary in excess of that stated in the Specifications for manufacturers’ services, additional time required to perform the specified services shall be considered incidental work.

B. Schedule manufacturer’s field services to avoid conflicting with other field testing or other manufacturer’s field services.

1. Determine that all conditions necessary to allow successful testing have been met before scheduling field services.

C. Only those days of service approved by the Engineer will be credited to fulfill the specified minimum services.

D. If specified, manufacturer’s services shall include as a minimum:

1. Inspection, checking, and adjustment as required for equipment to function as warranted by manufacturer and necessary to provide written approval of installation.

2. Revisiting the site as required to correct problems and until installation and operation are acceptable to the Engineer.

3. Resolution of assembly or installation problems attributable to or associated with, respective manufacturer’s products and systems.

4. Assistance during functional and performance testing and startup demonstration, and until product acceptance by the Owner.

5. Training of the Owner’s personnel in the operation and maintenance of respective product as required herein.
6. Completion of Manufacturer’s Certificate of Proper Installation with applicable certificates for proper installation and initial, interim, and final test or service.

1.06 TRAINING SCHEDULE

A. List specified equipment and systems with respective manufacturers that require training services of manufacturers' representatives and show:

1. Estimated dates for installation completion.
2. Estimated training dates to allow for multiple sessions when several shifts are involved.

B. Adjust training schedule to ensure training of appropriate personnel as deemed necessary by the Owner, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment.

C. Coordinate with Section 01310, Construction Schedules.

1.07 TRAINING OWNER’S PERSONNEL

A. Provide trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with the Owner, and familiar with operation and maintenance manual information specified in Section 01730, Operation and Maintenance Data.

B. Furnish manufacturers' representatives to provide detailed training to the Owner's personnel on operation and maintenance of specified product (system, subsystem, component) and as may be required in applicable Specifications.

1. Training services include pre-startup classroom instruction, post-startup classroom instruction, and onsite hands-on instruction.
2. Manufacturer's Representative: Familiar with facility operation and maintenance requirements as well as with specified equipment.

C. Pre-startup Training:

1. Coordinate training sessions with the Owner's operating personnel and manufacturers' representatives, and with submission of operation and maintenance manuals in accordance with Section 01730, Operation and Maintenance Data.
2. Complete at least 14 days prior to actual startup.

D. Post-Startup Training: If required in Specifications, furnish and coordinate training of the Owner’s operating personnel by respective manufacturer's representatives.

E. Taping of Training Sessions: Provide audio and color video taping of pre-startup and post-startup instruction sessions, including manufacturers' representatives' hands-on equipment instruction.
1. Use VHS format, suitable for playback on standard equipment available commercially in the United States.

2. Video Training Tapes: Produced by a qualified, professional video production company.

3. Furnish the Owner with two complete sets of tapes fully indexed and cataloged with printed labels stating sessions and dates taped.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EQUIPMENT, TESTING & INSPECTION

A. Regardless of the number of days specified in the individual sections for the manufacturer’s representative to be present on the site for inspection and testing, if the equipment fails to perform as specified, then the representative shall remain on site until the malfunction is corrected.

B. The cost for the additional days shall not be added to the cost for the Owner, but shall be to the account of the Contractor.

END OF SECTION
SECTION 01630

SUBSTITUTIONS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Furnish and install products specified and named in their respective Specifications or on the Drawings unless substitution is allowed.

B. For products specified only by reference standard, select product meeting that standard, by any manufacturer.

C. For products specified by naming several products or manufacturers, select any one of those products and manufacturers names which complies with their respective Specifications.

D. For products specified by naming only one or more products or manufacturers and stating "or equal", submit a request as for substitutions, for any product or manufacturer which is not specifically named.

E. Requests for any substitutions not submitted in accordance with the instructions herein will be denied.

1.02 RELATED SECTIONS

A. Section 01340 – Shop Drawings, Working Drawings and Samples

B. Other Sections as Applicable

1.03 PRODUCTS LIST

A. Within 30 days after award of Contract, submit to Engineer five copies of complete list of major Products which are proposed for installation.

B. Product selection is governed by the Contract Documents and governing regulations, not by previous project experience.

1. Where a single or multiple products or manufacturers are named, provide one of the products indicated or submit a request for substitution for any product or manufacturer not named unless no substitutions are permitted

2. Where the Specifications only require compliance with performance requirements, an imposed code, standard or regulation, select a product that complies with the requirements, standards, codes or regulations specified.

3. Manufacturers named in a Specification section are those manufacturers considered capable of manufacturing products conforming to the specified requirements. The naming of a particular manufacturer does not imply acceptance or approval of just any standard product of that manufacturer.
C. Tabulate Products by specification section number and title.

D. For products specified only by reference standards, list for each such Product:

1. Name and address of manufacturer.
2. Trade Name.
3. Model or catalog designation.
4. Manufacturer's data:
   a. Reference standards.
   b. Performance test data.

1.04 SUBSTITUTION SUBMITTAL REQUIREMENTS

A. For convenience in designation in the Contract Documents, materials to be incorporated in the Work may be designated under a trade name or the name of a manufacturer and its catalog information. The use of alternative material which is equal in quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements:

1. The burden of proof as to the quality and suitability of such alternative equipment, products, or other materials shall be upon the Contractor.
2. The Engineer will be the sole judge as to the comparative quality and suitability of such alternative equipment, products, or other materials and its decisions shall be final.
3. Base Bid requirements outlined in the Bid Form.

B. The Contractor may offer any material, process, or equipment which it considers equivalent to that indicated. Unless otherwise authorized in writing by the ENGINEER, the substantiation of offers of equivalency must be submitted within 30 days after execution of the Agreement. The Contractor, at its sole expense, shall furnish data concerning items it has offered as equivalent to those specified. The Contractor shall have the material as required by the Engineer to determine that the quality, strength, physical, chemical, or other characteristics, including durability, finish, efficiency, dimensions, service, and suitability are such that the items will fulfill its intended function. Installation and use of a substitute item shall not be made until accepted by the Engineer. If a substitute offered by the Contractor is found to be not equal to the specified material, the Contractor shall furnish and install the specified material.

C. The Contractor's attention is further directed to the requirement that failure to submit data substantiating a request for the substitution of an "or equal" item within said 30-day period after the execution of the Agreement, shall be deemed to mean that the Contractor intends to furnish one of the specific brand-named products named in the specification, and the Contractor does hereby waive all rights to offer or use substitute products in each such case. Wherever a proposed substitute product has not been submitted within said 30-day period, or wherever the submission of a proposed substitute product fails to meet the requirements of the specifications and an acceptable resubmittal is not received by the Engineer
within said 30-day period, the Contractor shall furnish only one of the products originally-named in the Contract Documents.

D. Within a period of 30 days after award of Contract, Engineer will consider formal requests from the Contractor for substitution of specified products.

E. After the end of that period, the request will be considered only in case of product unavailability or other conditions beyond the control of the Contractor.

F. Submit a separate request for each substitution. Support each request with:

1. Complete data substantiating compliance of the proposed substitution with requirements stated in the Contract Documents:
   a. Product identification, including manufacturer's name and address.
   b. Manufacturer's literature; identify:
      1) Product description.
      2) Reference standards.
      3) Performance and test data.
   c. Samples, as applicable.
   d. Name and address of similar projects on which product has been used, and the date of each installation.

2. Itemized comparison of the proposed substitution with product specified; List significant variations.

3. Comparison of the qualities of the proposed substitution with that specified.

4. Changes required in other elements of the work because of the substitution.

5. Availability of maintenance service, and source of replacement materials.

6. Data relating to changes in the construction schedule.

7. Any effect of the substitution on separate contracts.

8. List of changes required in other work or products.

9. Accurate cost data comparing proposed substitution with product specified.

10. Designation of required license fees or royalties.

11. Designation of availability of maintenance services, and sources of replacement materials.

12. Cost data is complete and includes related costs under his Contract, but not:
   a. Cost data comparing the proposed substitution with the product specified.
   b. Any required license fees or royalties.
   c. Engineer's costs of redesign or revision of Contract Documents.
13. Substitute products shall not be ordered or installed without written acceptance of Engineer.

G. Do not imply or indicate substitutions on shop drawings or product data submittals without a separate formal request.

H. Only one request for substitution for each product will be considering. If not accepted, Contractor shall provide specified product.

1.05 SUBSTITUTIONS WILL NOT BE CONSIDERED FOR ACCEPTANCE WHEN:

A. They are indicated or implied on Shop Drawings or product data submittals without a formal request from Contractor.

B. The manufacture of the product substitution does not meet the Qualifications as stated in the specifications as determined by the Engineer.

C. They are requested directly by a subcontractor or supplier.

D. No data is provided relating to changes in construction schedule.

E. There is any effect of substitution on separate contracts.

F. Changes are required in other work or products.

G. There is no accurate cost data comparing proposed substitution with product specified.

H. There are required license fees or royalties above and beyond the specified vendor.

I. Availability of maintenance services, sources of replacement materials does not equal that provided by the specified vendor.

J. Acceptance will require substantial revision of Contract Documents.

1.06 CONTRACTOR'S REPRESENTATION

A. A request for a substitution constitutes a representative that Contractor:

1. He has investigated proposed product and has determined that it is equal to or superior in all respects to that specified.

2. He will provide the same warranties or bonds for substitution as for product specified.

3. He will coordinate installation of accepted substitution into the Work, and will make such changes as may be required for the Work to be complete in all respects.

4. He waives claims for additional costs caused by substitution which may subsequently become apparent.
1.07 ENGINEER DUTIES

1. Review Contractor's requests for substitutions in accordance the Shop Drawing review requirements.

2. Notify Contractor, in writing, of decision to accept or reject requested substitution.

3. The Engineer shall be the judge of the acceptability of the proposed substitution.

1.08 SUBSTITUTION SUBMITTAL REQUIREMENTS – “NO SUBSTITUTIONS PERMITTED”

A. Contractor may not request a substitute item or vendor/manufacturer for which the specifications indicate "No Substitutions Permitted".

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Administrative and procedural requirements for project closeout.
   1. Inspection procedures.
   2. Project Record Document submittal.
   3. Final cleaning.

B. Warranty and bond submittal.

C. Closeout submittals, warranties and bonds required for specific products of work.

1.02 RELATED SECTIONS

A. Section 01310 - Construction Schedules

B. Section 01370 - Schedule of Values

C. Section 01380 - Construction Photographs

D. Section 01710 - Cleaning

E. Section 01720 - Project Record Documents

F. Section 01740 – Warranties and Bonds

G. Other Sections as applicable.

1.03 SUBSTANTIAL COMPLETION

A. Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

   1. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

   2. Advise Owner of pending insurance change-over requirements.

   3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

   4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
5. Submit record drawings, maintenance manuals, and similar final record information.

6. Complete start-up testing of systems, and instruction of the Owner’s operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

B. When the Contractor considers the Work to be substantially complete, he shall submit a written notice to the Engineer that the Work, or designated portion of the Work, is complete and ready for inspection.

C. Within a reasonable time of receipt of a request for inspection, the Engineer will either proceed with inspection or advise the Contractor of unfulfilled requirements. When the Engineer and Owner concur that the Work, or designated portion of the Work, is substantially complete, the Engineer will prepare the Certificate of Substantial Completion following inspection.

D. Should the Engineer determine that the Work is not substantially complete, he will advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Engineer will repeat inspection when requested and assured that the Work has been substantially completed.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.04 FINAL COMPLETION

A. When Contractor considers the Work to be complete, he shall submit written certification to the Engineer that the Work is completed and ready for final inspection. Include the following:

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Engineer’s final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, the list has been endorsed and dated by the Engineer.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the Work.

5. Submit consent of surety to final payment.

6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
B. The Engineer will inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Engineer.

1. Upon completion of inspection, the Engineer will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete, or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, re-inspection process will be repeated.

C. RECORD DOCUMENT SUBMITTALS (refer to Section 01720 - Project Record Documents).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01710

CLEANING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Execute cleaning, during progress of the Work, and at completion of the Work, as required by General Conditions.

1.02 RELATED SECTIONS

A. Section 01010 – Summary of Work
B. Section 01505 – Control of Work
C. Section 01550 – Site Access and Storage
D. Other Sections as applicable.

1.03 DISPOSAL REQUIREMENTS

A. Do not dispose of any unsuitable fill, hazardous or organic material onsite. All such material shall be disposed of in a legal manner by the Contractor, the cost of which shall be included in the Bid.
B. Conduct cleaning and disposal operations to comply with applicable codes, ordinances, regulations, and anti-pollution laws.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION

A. The Contractor shall keep the area of the work and other areas utilized or impacted by construction in a neat and clean condition, free from any accumulation of
rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the work site, and shall establish regular intervals of collection and disposal of such materials and waste. The Contractor shall also keep its haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations.

B. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.

C. Provide on-site containers for the collection of waste materials, debris and rubbish as required.

3.02 DUST ABATEMENT

A. The Contractor shall furnish all labor, equipment, and means required and shall carry out effective measures wherever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. Means for the control of dust shall include, but not be limited to, sweeping and water trucks. The Contractor shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the Engineer.

3.03 FINAL CLEANING

A. Remove temporary protection and facilities installed for protection of the Work during construction.

B. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

C. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION
SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION
A. This Section includes the requirements for maintaining, recording and submitting Project Record Documents including, but not limited to,
   1. Record Drawings or As-Built Drawings
   2. Record Specifications and other Contract Documents
   3. Record Samples, Shop Drawings or Record Product Data

1.02 RELATED SECTIONS
A. Section 01050 – Field Engineering and Surveying
B. Section 01152 – Applications for Payment
C. Section 01340 - Shop Drawings, Working Drawings and Samples
D. Section 01700 – Project Closeout
E. Other Sections as applicable.

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES
A. Maintain at the site for the Owner and Engineers review one record copy of:
   1. Drawings
   2. Specifications
   3. Addenda
   4. Change Orders and other Modifications to the Contract
   5. Engineer's Field Orders or Written Instructions
   6. Approved Shop Drawings, Working Drawings, and Samples
   7. Field Test Reports
   8. Construction Photographs
B. Store Record Documents in the Contractor's field office apart from documents used for construction.
C. File Record Documents in accordance with the CSI format number system utilized in the Contract Documents.
D. Maintain Record Documents in a clean, dry, legible condition and in good order. Do not use Record Documents for construction purposes.

E. Make Record Documents available at all times for inspection by the Engineer.

F. As a prerequisite for monthly progress payments, the Contractor is to exhibit the currently updated Record Documents for review by the Engineer and the Owner.

1.04 RECORDING

A. Record Drawings:

1. Maintain a clean, undamaged set of prints of Contract Drawings to serve as the project Record Drawings.

2. Label each sheet "RECORD DRAWING" in neat large printed letters with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.

3. The Record Drawings shall be presented at the same scale as the Contract Drawings.

4. The Record Drawings shall correctly and accurately show all changes from the Contract Drawings made during construction.

5. All information shall be verified and certified by an independent Professional Surveyor and Mapper registered in the State of Florida.

6. All vertical information shall be provided in the datum indicated in the Contract Drawings.

7. Horizontal and vertical locations referenced to base-line or permanent surface improvements.

8. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross reference at the corresponding location on the Record Drawings.

9. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

10. Mark new information that was not shown on Contract Drawings or Shop Drawings.

11. Note related Change Order numbers where applicable.

12. Organize Record Drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

13. Do not use Record Drawings for construction purposes.

14. Record information concurrently with construction progress.

B. The Record Drawings shall be neat and legible including the following:

1. Above ground piping and equipment:
a. All equipment locations, dimensions and elevations as indicated in the Contract Drawings.

b. All building and tank locations, dimensions and elevations as indicated in the Contract Drawings.

c. All above ground piping size, material, class, lengths, dimensions, and elevations as indicated in the Contract Drawings.

d. Horizontal locations of piping, fittings, valves and appurtenances.

e. Elevations of the top of pipe, fittings, valves and appurtenances as indicated in the Contract Drawings and at 50’ maximum increments.

f. All changes from the original design.

2. Underground pressure pipe including potable water mains sanitary sewer force mains, drainage force mains and the like:

a. All piping size, material, class, lengths, dimensions, bury depth and elevations as indicated in the Contract Drawings.

b. Horizontal locations of piping, fittings, valves and appurtenances.

c. Elevations of the top of pipe, fittings, valves and appurtenances.

d. Elevations as indicated in the Contract Drawings and at 50’ maximum increments.

e. Lengths of restrained pipe.

f. Water service locations.

g. Meter sizes.

h. All changes from the original design.

3. Gravity sanitary sewer:

a. All piping size, material, class, lengths, slopes, dimensions and elevations as indicated in the Contract Drawings.

b. Horizontal locations of manholes.

c. Rim, invert, and size of all manholes.

d. Service terminal end locations.

e. Wet well construction including diameter, bottom, invert and float elevations.

f. All changes to piping from the original design.
4. Stormwater Drainage:
   a. All piping size, material, class, lengths, dimensions and elevations as indicated in the Contract Drawings.
   b. Horizontal locations of manholes and catch basins.
   c. Rim, invert, bottom elevations and size of all manholes and catch basins.
   d. All surface elevations indicated on the Contract Drawings including, but not limited to, swales, berms, yards, sidewalks, and the like.
   e. Horizontal location and elevation of all storm water retention or detention areas.
   f. All changes from the original design.

5. Limerock base:
   a. Upon completion of all underground utilities and limerock base, and before placement of asphalt, provide the following for Engineer review:
      1) Finished limerock base elevations taken at the location of finished asphalt elevations as indicated in the Contract Drawings.
      2) Additional elevations as required by the Engineer, including, but not limited to:
         a) Finished limerock base at centerline, edge of median and edge of pavement.
         b) Back of sidewalk or right of way.
         c) Bottom of swale or flow line of gutter.
         d) Top of curb.
         e) High points, low points and grade breaks.
         f) Intersections.

6. Electrical, instrumentation and controls
   a. Horizontal location of all electrical equipment and control cabinetry.
   b. Elevations of the bottom of all electrical and control panels.
   c. Horizontal location and elevation of all conduits including conduit size, route and wire size.
   d. Horizontal location of all light poles and junction boxes.

7. Miscellaneous:
   a. Horizontal location and elevation of all concrete slabs.
   b. Horizontal location, size and material of all fencing.
c. Location size and material of all existing utilities encountered during construction whether indicated on the Contract Drawings or not.

d. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

e. Depths of various elements of foundation in relation to finish first floor datum.

f. Field changes of dimensions and details.

g. Details not on original contract drawings.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction.

1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.

2. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation.

3. Note related record drawing information and Product Data.

4. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

5. Changes made by field order or by Change Order.

D. Record Product Data (Shop Drawings): Maintain one copy of each Product Data submittal.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations.

2. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned later by direct observation.

3. Note related Change Orders and mark-up of record drawings and Specifications.

E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Engineer and the Owner to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.
F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work.

1.05 SUBMITTAL

A. Project Record Documents, demonstrating construction progress, shall be submitted with each Application for Payment.

B. Interim Project Record Drawings shall be submitted at significant project milestones including:

1. Construction of wet well or other structures.
2. Construction of catch basins, manholes, pipes and appurtenances.
3. As required by the Engineer.

C. Project Record Documents, demonstrating construction completion shall be submitted with the balance of Closeout documents at the conclusion of construction including:

1. Three sets of signed and sealed sets of prints.
2. One compact disc copy of record drawings in Autocad format.

D. Accompany submittals with transmittal letter in duplicate, containing:

1. Date
2. Project Title and Number
3. Contractor’s Name and Address
4. Title and Number of each Record Document
5. Signature of Contractor or his Authorized Representative

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01730
OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 DESCRIPTION

A. Compile product data and related information appropriate for Owner's maintenance and operation of products furnished under Contract.
   1. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent sections of Specifications.

B. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.

1.02 RELATED SECTIONS

A. Section 01340 – Shop Drawings, Working Drawings and Samples
B. Section 01700 – Contract Closeout
C. Section 01720 – Project Record Documents
D. Section 01740 – Warranties & Bonds
E. Other Sections as applicable.

1.03 QUALITY ASSURANCE

A. Preparation of data shall be done by personnel:
   1. Trained and experienced in maintenance and operation of described products.
   2. Familiar with requirements of this Section.
   3. Skilled as technical writers to the extent required to communicate essential data.
   4. Skilled as draftsman competent to prepare required drawings.

1.04 FORM OF SUBMITTALS

A. Prepare data in form of an instructional manual for use by Owner's personnel.

B. Format
   1. Size: 8 1/2 inches x 11 inches
   2. Paper: 20 pound minimum, white, for typed pages.
3. Text: Manufacturer's printed data, or neatly typewritten.

4. Drawings:
   a. Provide reinforced punched binder tab, bind in with text.
   b. Reduce larger drawings and fold to size of text pages, but not larger than 11 inches x 17 inches.

5. Provide fly-leaf for each separate product, or each piece of operating equipment.
   a. Provide types description of product, and major component parts of equipment.
   b. Provide indexed tabs.

6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:
   a. Title of Project
   b. Identity of separate structure as applicable.
   c. Identity of general subject matter covered in this manual.

C. Binders
   2. Maximum ring diameter shall be 2 inches.
   3. When multiple binders are used, correlate the data into related consistent groupings.

1.05 CONTENT OF MANUAL

A. Neatly typewritten Table of Contents for each volume, arranged in systematic order.
   1. Contractor, name of responsible principal, address, and telephone number.
   2. A list of each product required to be included, indexed to content of the volume.
   3. List, with each product, name, address, and telephone number of:
      a. Subcontractor of installer
      b. Maintenance contractor, as appropriate
      c. Identify area of responsibility of each
      d. Local source of supply for parts and replacement.
4. Identify each product name and other identifying symbols as set forth in Contract Documents.

B. Product Data

1. Include only those sheets which are pertinent to the specific product.
2. Annotate each sheet to:
   a. Clearly identify specific product or part installed.
   b. Clearly identify data applicable to installation.
   c. Delete references to inapplicable information.

C. Drawings

1. Supplement product date with drawings as necessary to clearly illustrate:
   a. Relations of component parts of equipment and systems.
   b. Control and flow diagrams.
2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
3. Do not use Project Record Documents as maintenance drawing.

D. Written text, as required to supplement product date for the particular installation:

1. Organize in consistent format under separate headings for different procedures.
2. Provide logical sequence of instructions of each procedure.

E. Copy of each warranty, bond and service contract issued:

1. Provide information sheet for Owner's personnel, give:
   a. Proper procedures in event of failure.
   b. Instances which might affect validity of warranties or bonds

1.06 MANUAL FOR MATERIALS AND FINISHES

A. Submit five copies of complete manual in final form.

B. Content for architectural products, applied materials and finishes

1. Manufacturer's data, giving full information on products.
   a. Catalog number, size, composition.
   b. Color and texture designations.
c. Information required for re-ordering special-manufactured products.

2. Instructions for care and maintenance.
   a. Manufacturer’s recommendation for types of cleaning agents and methods.
   b. Cautions against cleaning agents and methods which are detrimental to product.
   c. Recommended schedule for cleaning and maintenance.

3. Content, for moisture-protection and weather-exposed products

4. Manufacturer’s data, giving full information on products
   a. Applicable standards.
   b. Chemical composition.
   c. Details of installation.

5. Instructions for inspection, maintenance and repair.

C. Additional requirements for maintenance data: Respective sections of Specifications.

D. Provide complete information for products specified.

1.07 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit five copies of complete manual in final form.

B. Content, for each unit of equipment and system, as appropriate:

1. Description of unit and component parts.
   a. Function, normal operating characteristics and limiting conditions.
   b. Performance curves, Engineering data and tests.
   c. Complete nomenclature and commercial number of replaceable parts.

2. Operating procedures
   a. Start-up, break-in, routine and normal operating instructions.
   b. Regulation, control, stopping, shut-down and emergency instructions.
   c. Summer and winter operating instructions.
d. Special operating instructions.

3. Maintenance Procedures
   a. Routine operations
   b. Guide to "trouble-shooting"
   c. Disassembly, repair and reassembly
   d. Alignment, adjusting and checking

4. Servicing and lubrication schedule
   a. List of lubricants required

5. Manufacturer's printed operating and maintenance instructions.

6. Description of sequence of operation by control manufacturer.

7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
   a. Predicted list of parts subject to wear
   b. Items recommended to be stocked as spare parts

8. As-installed control diagrams by controls manufacturer.

   a. As-installed color coded piping diagrams

10. Charts of valve tag numbers, with location and function of each valve.

11. List of original manufacturer's spare parts, manufacturer's current prices and recommended quantities to be maintained in storage.

12. Other data as required under pertinent sections of specifications.

C. Contents, for each electric and electronic system, as appropriate

1. Description of system and component parts.
   a. Function, normal operating characteristics, and limiting conditions
   b. Performance curves, Engineering data and tests
   c. Complete nomenclature and commercial number of replaceable parts

2. Circuit directories of panel-boards
   a. Electrical service
   b. Controls

3. As-installed color coded wiring diagrams.
4. Operating procedures:
   a. Routine and normal operating instructions
   b. Sequences required
   c. Special operating instructions

5. Maintenance procedures
   a. Routine operations
   b. Guide to "trouble-shooting"
   c. Disassembly, repair and reassembly
   d. Adjustment and checking

6. Manufacturer's printed operating and maintenance instructions.

7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

8. Other data as required under pertinent sections of specifications.

D. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel.

E. Additional requirements for operating and maintenance data: Respective sections of Specifications.

F. Provide complete information for product specified.

1.08 SUBMITTAL SCHEDULE

A. Submit two copies of preliminary draft of proposed formats and outlines of contents of Operation and Maintenance Manuals within 30 days after Notice to Proceed.

1. The Engineer will review the preliminary draft and return one copy with comments.

B. Submit two copies of completed data in final form no later than 30 days following the Engineer's review of the last shop drawing and submittal specified under Section 01340.

1. One copy will be returned with comments to be incorporated into final copies.

C. Submit specified number of copies of approved data in final form directly to the offices of the Engineer, Calvin, Giordano & Associates, within 30 calendar days of product shipment to the project site and preferably within 30 days after the reviewed copy is received.

D. Submit six copies of addendum to the operation and maintenance manuals as applicable and certificates as specified in paragraph 1.01B of Section 01030 within 30 days after final inspection and plant start-up test.

E. Final Operation and Maintenance submittals shall be in large three-ring binders organized by specification Section and plainly marked per paragraph 1.04Ca.
1.09 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in operation, adjustment, and maintenance of products, equipment and systems.

B. Operating and maintenance manual shall constitute the basis of instruction.

1. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.

1.10 ENGINEER'S O & M CHECKLIST

A. The Engineer will review Operation and Maintenance Manuals submittals on operating equipment for conformance with the requirements of this Section. The review will generally be based upon the O&M Review Checklist (presented on the pages at the end of this section for the benefit of the Contractor and his suppliers).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)
O & M REVIEW CHECKLIST

EQUIPMENT SUBMITTED __________________________ DATE OF SUBMITTAL ____________

MANUFACTURER __________________________ DEGREE OF APPROVAL ____________

SPECIFICATION SECTION __________________________ DRAWING NUMBER ____________

______ Is the submittal correct for model/series/configuration originally submitted with shop drawings?

______ Is the binding correct with assigned color/printing etc.?
(Pertains to final three volumes)

______ Is the submittal properly indexed?

______ Does the submittal pertain only to equipment being furnished?

______ Does the submittal include start-up, shutdown and troubleshooting procedures?

______ Are sufficient drawings and schematics included to supplement written descriptions?

______ Is the listing of name plate data for each piece of supplied equipment provided and attached?

______ Are all submitted “C” and “D” size drawings printed on paper that is 11 inches high and folded to 8 1/2 inches wide?

______ Is proper and complete instruction for servicing included?

______ Is there a suggested operating log sheet for equipment?

______ Is schedule for lubrication provided?

______ Is there a recommended preventative maintenance schedule?

______ Are necessary safety precautions clearly indicated where they relate to the equipment?

______ Is the Area Representative information provided, i.e., Name, Address, Telephone Number?

______ Are specified spare parts indicated and listed?

The following are the points of rejection requiring resubmittal by Contractor:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

END OF SECTION
SECTION 01740
WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 DESCRIPTION
   A. Compile warranties and bonds as specified in the Contract Documents.
   B. Co-execute submittals when so specified.
   C. Review submittals to verify compliance with Contract Documents.
   D. Submit to the Engineer for review and transmittal to Owner.

1.02 RELATED SECTIONS
   A. Section 01700 - Contract Closeout
   B. Other Sections as applicable.

1.03 SUBMITTAL REQUIREMENTS
   A. Assemble warranties, bond, service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.
   B. Number of original signed copies required: two (2) each.
   C. Table of Contents: neatly typed, in orderly sequence. Provide complete information for each item.
      1. Product or work item
      2. Firm, with name of principal, address and telephone number
      3. Scope
      4. Date of beginning of Warranty, bond or service and maintenance contract
      5. Duration of warranty, bond or service maintenance contract
      6. Provide information for Owner's personnel:
         a. Proper procedure in case of failure
         b. Instances which might affect the validity of warranty or bond
      7. Contractor, name of responsible principal, address and telephone number

1.04 FORM OF SUBMITTALS
   A. Prepare in duplicate packets
B. Format:

1. Size 8 1/2 inches x 11 inches, punch sheets for standard 3-post binder
2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
   a. Title of Project
   b. Name of Contractor

C. Binders: Commercial quality, three-post (3) binder, with durable and cleanable plastic covers and maximum post width of 2 inches.

1.05 WARRANTY SUBMITTAL REQUIREMENTS

A. For all equipment, submit a one-year warranty from the equipment manufacturer, unless otherwise specified. The manufacturer's warranty period shall be concurrent with the Contractor's for one year commencing at the time of acceptance by the Owner.

B. The Contractor shall be responsible for obtaining certificates for equipment warranty for all major equipment and which has a 1 HP motor or which lists for more than $1,000. The Engineer reserves the right to request warranties for equipment not classified as major. The Contractor shall still warrant equipment not considered to be "major" in the Contractor's one-year warranty period even though certificates of warranty may not be required.

C. In the event that the equipment manufacturer or supplier is unwilling to provide a one-year warranty commencing at the time of Owner acceptance, the Contractor shall obtain from the manufacturer a two (2) year warranty commencing at the time of equipment delivery to the job site. This two-year (2) warranty from the manufacturer shall not relieve the Contractor of the one-year warranty starting at the time of Owner acceptance of the equipment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.01  THE REQUIREMENT

A. The CONTRACTOR shall remove and dispose of or salvage any existing structure, piping, conduits, electrical equipment, mechanical equipment, or appurtenances or portions thereof, as shown on the Drawings and specified herein or required to complete the project.

B. All materials designated for disposal shall become the CONTRACTOR'S property and shall be removed from the site and disposed off by the CONTRACTOR.

C. All materials for salvage shall be carefully removed and moved to the TOWN's designated location.

1.02  SUBMITTALS

A. The CONTRACTOR shall review with the TOWN the proposed methods, equipment, and operation sequence. Include coordination for shut-off, continuation of service and other applicable items to ensure no interruption of operations except as herein before specified.

1.03  CONSTRAINTS

A. Closing or obstructing of roadways adjacent to the work by the placement or storage of materials will not be permitted. All operations shall be conducted with a minimum interference to traffic on these ways.

B. **Scheduling:** The CONTRACTOR shall carry out its operations to avoid interference with operations and work in the existing facilities.

C. **Notification:** At least 48 hours prior to commencement of a demolition or removal, the CONTRACTOR shall notify the TOWN in writing of its proposed removal schedule.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01  GENERAL

A. Prior to commencing work, the CONTRACTOR shall check all underground and exposed existing utility and process piping and all equipment in any way associated or in the proximity to the items to be removed and shall verify that the piping is
inactive (abandoned) and that electric power to equipment, lighting, controls, etc., has been permanently disconnected. Active services shall be brought to the attention of the CITY for proper action.

B. The CONTRACTOR shall remove all equipment and accessories in a workman-like manner and shall take all necessary precautions to avoid damaging existing equipment, piping, and structure which are to be retained. Damages shall be repaired or replaced at the expense of the CONTRACTOR.

C. The CONTRACTOR shall proceed with the removal of the structures, equipment, piping, and appurtenances in a sequence designed to maintain the facilities in continuous operation.

D. All supports, pedestals, and anchors shall be removed with the equipment structures and piping unless otherwise specified or required. Concrete bases, anchor bolts, and other supports shall be removed to approximately one inch below the surrounding finished area; and the recesses shall be patched to match the adjacent areas. Superstructure wall and roof openings shall be closed, damaged surfaces shall be patched to match the adjacent areas. Wall sleeves and castings shall be cleared of extraneous materials and filled with non-shrink grout as recommended by manufacturer for water-tightness required. All openings in concrete shall be closed in a manner meeting the requirements of the appropriate sections of these Specifications, as shown on the construction documents.

3.02 UNAUTHORIZED REMOVAL

A. Any equipment, piping, and appurtenances removed without proper authorization, shall be replaced at no cost to the CITY.

3.03 SALVAGED ITEMS

A. Items to be salvaged shall be tagged and shall remain the property of the CITY. The CONTRACTOR shall carefully move salvaged equipment to a CITY designated location.

3.04 DEMOLITION

A. All materials and equipment shown on the Drawings to be removed or demolished shall become the property of the CONTRACTOR, with the exception of items tagged by the CITY to be salvaged. Prior to removal of any existing equipment or piping from the site of work, the CONTRACTOR shall ascertain from the CITY if the particular item or items are to be salvaged. The CONTRACTOR shall dispose of all demolition materials, equipment, debris and all other items off the project site and in conformance with all existing applicable laws and regulations.

3.05 STRUCTURAL REMOVALS

A. The CONTRACTOR shall remove structures to the lines and grades shown on the construction documents.
B. All wood, concrete, brick, tile, concrete block, roofing materials, reinforcement, structural or miscellaneous metals, plaster, wire mesh and other items contained in or upon the structure shall be removed and taken from the project site. These items shall not be used in backfill.

C. **Finishes:** After removal of parts or all of masonry walls, slabs and like work, which tie into new work or existing work, the point of junction shall be neatly repaired to leave only finished edges and surface exposed. The jambs, sills and heads of any new windows, passageways, doors or other openings cut into the new work or existing work shall be dressed with new masonry, concrete or metal to provide a smooth, finished appearance.

D. **Anchoring:** Where new anchoring materials to existing work, they shall be included under this Section, except where specified elsewhere (this includes bolts, nuts, hangers, welds and reinforcing steel as required to attach new work).

### 3.06 MECHANICAL REMOVALS

A. **General:** Mechanical removals shall consist of dismantling and removing existing piping, equipment, support (legs), and other appurtenances as shown or required for the completion of the work. It shall include cutting, capping, patching and plugging as required.

B. Wherever piping is to be removed, adjacent pipe headers that are to remain in service shall be blanked off or plugged and then anchored in an acceptable manner.

### 3.07 ELECTRICAL REMOVALS

A. **General:** Electrical removals shall consist of the removal of conduits and wires, and miscellaneous electrical equipment all as shown, specified or required to perform the work.

### 3.08 REPAIR WORK

A. Surfaces of walls, or floors, which are exposed by any of the removals specified herein, and which have holes, scars, chipped or other damaged surfaces revealed by the removal, shall be repaired by the CONTRACTOR.

### 3.09 CLEANUP

A. The CONTRACTOR shall remove from the project site all debris resulting from the demolition and removal operations as it accumulates. Upon completion of the demolition work, all materials, equipment, waste and debris of every sort shall be removed and the premises shall be left clean, neat and orderly.

END OF SECTION
PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment, and incidentals necessary to perform all excavation, backfill, fill, grading and slope protection required to complete the piping work shown on the Drawings and specified herein. The work shall include, but not necessarily be limited to: manholes, pits and pipe, all bedding, backfilling, fill and required borrow; grading and disposal of surplus and unsuitable materials; and all related work such as sheeting, bracing and water handling.

B. It shall be the Contractor's responsibility to provide trench safety systems such as sheeting and bracing in accordance with state and local regulations.

1.02 RELATED WORK

A. Other sections as applicable.

1.03 TRENCH PROTECTION

A. The Contractor shall construct and maintain sheeting and bracing as required to support the sides of excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction, and to protect adjacent structures, existing piping and foundation material from disturbance, undermining, or other damage. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed they shall be immediately filled and compacted.

B. For pipe trench sheeting, no sheeting is to be withdrawn if driven below mid-diameter of any pipe, and no wood sheeting shall be cut off at a level lower than 1 foot above the top of any pipe unless otherwise directed by the Engineer. If during the progress of the work the Engineer decides that additional wood sheeting should be left in place, he may direct the Contractor in writing. If steel sheeting is used for trench sheeting, removal shall be as specified above, unless written approval is given by the Engineer for an alternate method of removal.

C. All sheeting and bracing, not left in place, shall be carefully removed in such a manner as not to endanger the construction or other structures, utilities, existing piping. All voids left or caused by withdrawal of sheeting shall immediately be refilled with sand or ramming with tools especially adapted to that purpose, by watering or otherwise as may be directed.
D. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his part to issue such orders, and his failure to exercise his right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.

1.04 JOB CONDITIONS

A. The Contractor shall examine the site and review the available test borings or undertake his own soil borings prior to submitting his bid, taking into consideration all conditions that may affect his work. The Owner and Engineer will not assume responsibility for variations of sub-soil quality or conditions at locations other than places shown and at the time the investigation was made.

B. Existing Utilities: Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.

1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the Engineer and the Owner of such piping or utility immediately for directions.

2. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

3. Demolish and completely remove from site existing underground utilities indicated on the drawings to be removed.

C. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.

1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1.05 SUBMITTALS

A. The Contractor shall furnish the Engineer, for approval, a representative sample of fill material obtained from on site sources weighing approximately 50 pounds, at least ten calendar days prior to the date of anticipated use of such material.

B. For each material obtained from other than on site sources, the Contractor shall notify the Engineer of the source of the material and shall furnish the Engineer, for approval, a representative sample weighing approximately 50 pounds, at least ten calendar days prior to the date of anticipated use of such material.
PART 2 - PRODUCTS

2.01 MATERIALS

A. General:

1. Materials for use as base, fill and backfill shall be described below:

   a. Satisfactory soil materials are defined as those complying with American Association of State Highway and Transportation Officials (AASHTO) M-145, soil classification Groups A-1, A-2-4, a-2-5, and a-3.

   b. Unsatisfactory soil materials are those defined in AASHTO M-145 soil classification Groups A-2-6, A-2-7, A-4, a-5, A-6, and a-7 along with peat and other highly organic soils.

B. Structural Fill:

1. Structural fill material shall be a well graded, suitable soil material consisting of a minimum of 60 percent clean medium fine grain sized quartz sand, free of organic, deleterious and/or compressible percent clean medium fine grain sized quartz sand, free of organic, deleterious and/or compressed material. Rock in excess of 2 1/2 inches in diameter shall not be used in the fill material. Structural fill shall not contain hardpan, stones, rocks, cobbles or other similar materials.

C. Common Fill:

1. Common fill material shall be satisfactory soil material containing no more than 20 percent by weight finer than No. 200 mesh sieve. It shall be free from organic matter, muck, marl, and rock exceeding 2 1/2 inches in diameter. Common fill shall not contain broken concrete, masonry, rubble or other similar materials.

2. Materials falling within the above specifications, encountered during the excavation, may be stored in segregated stockpiles for reuse. All material which, in the opinion of the Engineer, is not suitable for reuse shall be spoiled as specified herein for disposal of unsuitable materials.

D. Rock Bedding:

1. Rock bedding shall be 3/8” to 3/4” washed and graded limerock. This rock shall be graded so that 99% will pass a 3/4” screen and 80% will be retained on a No. 8 screen. Material meeting the Florida Department of Transportation Standard Specification for No. 57 stone shall be acceptable.
PART 3 - EXECUTION

3.01 GENERAL

A. All excavation, backfill and grading necessary to complete the work shall be made by the Contractor and the cost thereof shall be included in the Contract price.

B. Material shall be furnished as required from off site sources and hauled to site.

C. The Contractor shall take all necessary precautions to maintain the work area in a safe and workable condition.

D. The Contractor shall protect his work at all times by flagging, marking, lighting and barricading. It shall also be the Contractor’s responsibility to preserve and protect all above and underground structures, pipe lines, conduits, cables, drains, or utilities which are existing at the time he encounters them. Failure of the Drawings to show the existence of these obstructions shall not relieve the Contractor from this responsibility. The cost of repair of damage which occurs to these obstructions during or as a result of construction shall be borne by the Contractor without additional cost to the Owners.

3.02 TRENCH EXCAVATION

A. Excavation for all trenches required for the installation of pipes shall be made to the depths indicated on the Drawings. Excavate trench to provide minimum of 30-inch clear cover over the pipe bell unless otherwise noted on the Drawings. Excavate in such manner and to such widths as will give suitable room for laying the pipe within the trenches, for bracing and supporting and for pumping and drainage facilities. The trench width at the top of the pipe shall not exceed the allowable as determined by the depth of cut and indicated on the Drawings.

B. Rock shall be removed to a minimum 8-inches clearance around the bottom and sides of all the pipe or ducts being laid.

C. Where pipe is to be laid in limerock bedding or encased in concrete, the trench may be excavated by machinery to or just below the designated subgrade provided that the material remaining in the bottom of the trench remains undisturbed.

D. Where the pipes or ducts are to be laid directly on the trench bottom the lower part of the trenches shall not be excavated to the trench bottom by machinery. The last of the material being excavated shall be done manually in such a manner that will give a flat bottom true to grade so that pipe can evenly and uniformly supported along its entire length on undisturbed material or bedding rock. Bell holes shall be made as required manually so that there is no bearing surface on the bells and pipes are supported along the barrel only.

E. The bottom of the excavations shall be firm and dry and in all respects acceptable to the Engineer. Excavate any organic soil material from the bottom of the trench and replace with rock bedding, at least 6 inches thick.
3.03 PIPE INTERFERENCES AND ENCASEMENT

A. The contractor shall abide by the following schedule of criteria concerning interferences with other utilities.

1. In no case shall there be less than 0.3 feet between any two pipe lines and structures.

2. Class I Concrete Encasement: Wherever there is clearance between water mains or water services, then a concrete encasement shall be provided in accordance with the typical detail as shown on the Drawings.

3. Class II Concrete Encasement: Wherever there is more than 0.3 foot, but less than 1.0 foot clearance between any two pipe lines, or between pipe lines and structures, then a concrete encasement shall be provided in accordance with the typical detail as shown on the Drawings.

B. The Engineer shall have full authority to direct the placement of the various pipes and structures in order to facilitate construction, expedite completion and to avoid conflicts.

3.04 BACKFILLING

A. Backfilling over pipes shall begin as soon as practical after the pipe has been laid, jointed, and inspected and the trench filled with suitable compacted material to the mid-diameter of the pipe.

B. Backfilling over ducts shall begin not less than three days after placing concrete encasement.

C. All backfilling shall be prosecuted expeditiously as detailed on the Drawings.

D. Any space remaining between the pipe and sides of the trench shall be packed full by hand shovel with selected earth, from stones having a diameter greater than 2-inches and thoroughly compacted with a tamper as fast as placed, up to a level of one foot above the top of pipe. Compact to 95% maximum density in layers not to exceed 4 inches up to the centerline of the pipe from the trench bottom and in layers not to exceed 6 inches from the pipe centerline to 12 inches above the pipe.

E. The filling shall be carried up evenly on both sides with at least one man tamping for each man shoveling material into the trench.

F. The remainder of the trench above the compacted backfill, as just described above, shall be filled and thoroughly compacted with common fill by rolling, ramming, or puddling, as the Engineer may direct. Compact common fill in 12-inch layers to 95% maximum density.

G. The bedding rock in muck areas shall consist of the at least 10 inches of washed and grade limerock placed in the trench to the proposed elevation of the centerline of the pipe prior to any pipe laying. This bedding shall not be used under any circumstances as a drain for ground water. The Contractor shall take all
precautions necessary to maintain the bedding in a compacted state and to prevent washing, erosion or loosening of this bed.

H. In locations where pipes pass through building walls, the Contractor shall take the following precautions to consolidate the refill up to an elevation of at least 1 foot above the bottom of the pipes:

1. Place structural fill in such areas for a distance of not less than 3 feet either side of the centerline of the pipe in level layers not exceeding 6-inches in depth.

2. Wet each layer to the extent directed and thoroughly compact each layer with a power tamper to the satisfaction of the Engineer.

3.05 GRADING

A. Grading shall be performed at such places as are indicated on the Drawings, to the lines, grades and elevations shown or as directed by the Engineer and shall be made in such manner that the requirements for formation of embankments can be followed. All unacceptable material encountered, of whatever nature within the limits indicated, shall be removed and disposed of as directed. During the process of excavation, the grade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the prosecution or condition of the work.

B. If at the time of excavation it is not possible to place any material in its proper section of the permanent structure, it shall be stockpiled in approved areas for later use. No extras will be considered for the stockpiling or double handling of excavated material.

C. The right is reserved to make minute adjustments or revisions in lines or grades if found necessary as the work progresses, due to discrepancies on the Drawings or in order to obtain satisfactory construction.

D. Stones or rock fragments larger than 2 1/2 inches in their greatest dimensions will not be permitted in the top 6 inches of the subgrade line of all fills or embankments.

E. All fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings, or as directed by the Engineer.

F. In cut, all loose or protruding rocks on the back slopes shall be barred loose or otherwise removed to line or finished grade of slope. All cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings or as specified by the Engineer.

G. No grading is to be done in areas where there are existing pipe lines that may be uncovered or damaged until such lines which must be maintained are relocated, or where lines are to be abandoned, all required valves are closed and drains plugged at manholes.
H. The Contractor shall replace all pavement cut or otherwise damaged during the progress of the work as specified elsewhere herein or as shown on the Drawings.

3.06 DISPOSAL OF UNSUITABLE AND SURPLUS MATERIAL

A. All surplus and unsuitable excavated material shall be disposed of at the Contractor’s cost in one of the following ways as directed by the Engineer.

1. Transport to soil storage area on Owner’s property and stockpile or spread as directed by the Engineer.

2. Transport from Owner’s property and legally dispose of. Any permit required for the hauling and disposing of this material beyond Owner’s property shall be obtained prior to commencing hauling operations. Copies of all required permits shall be provided to the Engineer.

3. Suitable excavated material may be used for fill if it meets the specifications for common fill and is approved by the Engineer. Excavated material so approved may be neatly stockpiled at the site where designated by the Engineer provided there is an area available where it will not interfere with the operation of the facility nor inconvenience traffic or adjoining property owners.

3.07 FIELD QUALITY CONTROL

A. The Contractor shall retain a certified laboratory and make all arrangements for testing necessary to comply with these specifications, in accordance with Section 01410. The Engineer shall receive copies of all laboratory test results.

B. Conduct one test per lift for each 1,000 linear feet of pipeline, or a minimum of two compaction tests per lift for projects with less than 1,000 linear feet of pipeline, at locations directed by the Engineer.

END OF SECTION
PART 1 - GENERAL

1.01 SCOPE OF WORK
   A. Furnish all labor, materials, equipment and incidentals required and place asphaltic
cement concrete pavement in accordance with the grades and typical sections shown on the
Drawings and as specified herein.

1.02 RELATED WORK
   A. Clearing, grubbing and stripping are specified in Section 02221.

1.03 SUBMITTALS
   A. Submit shop drawings as specified in Section 01340.

PART 2 - PRODUCTS

2.01 MATERIALS
   A. The limerock base shall consist of grade No. 2 Miami Oolite limerock as specified by
section 911 of the Florida Department of Transportation Standard Specifications.
   B. The material used for the prime coat shall conform to the Florida Department of
Transportation Specifications for primer to be used on Miami Oolite limerock base.
   C. Bituminous material for tack coat shall meet the standard specifications of the
Florida Department of Transportation for the grade used and may be any suitable
grade of R.C.
   D. The materials of the asphaltic concrete surface shall conform with applicable
sections of Florida Department of Transportation Specifications for Type S-3
Asphaltic Concrete Surface Course.
   E. The paint used for parking and traffic stripes shall be white or yellow traffic paint
which shall be of a type approved by the Florida Department of Transportation
   F. Signs - General:
      1. The design and construction of traffic signs shall be in accordance with the
following standards:
         + Florida DOT Standard Specifications
         + Florida DOT Roadway and Traffic Design Standards.
2. All "STOP", "YIELD", and other required signs and street name signs shall be fabricated entirely with High Intensity reflective sheeting. Other signs shall be fabricated using engineering grade materials. Post-mounted signs shall be mounted on single or double steel U-Channel posts. Tubular posts shall not be used.

3. The paint used for parking and traffic stripes shall be as specified on the plans or be of a type approved by the District, Broward County and Department of Transportation.

4. Shop drawings and quantities for paint overhead sign structures, special designs for ground sign structures, shall be submitted to the Engineer for approval.

G. Guardrails
   1. The guardrail shall consist of 0.125-inch aluminum sheet, formed into a deep-beam type rail. Bolts and washers shall conform to DOT Standards for aluminum guardrails.
   2. Each end of the guardrail shall terminate in a terminal section, and lapped at the end post.
   3. The rail post shall consist of timber posts and offset on 8 centers. Mount reflector assembly on offset each 24'.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The subgrade preparation shall comply with the requirements of Section 160 of the Florida Department of Transportation Specifications. All soft and yielding material and other portions of the subgrade which will not compact readily shall be removed and replaced with suitable material and the whole subgrade brought to line and grade and to a foundation of uniform compaction and supporting power. The cost of removing and replacing unsuitable material shall be included in the bid for the paving.

B. The top 12 inches of the subgrade, in both cut and fill sections, shall be compacted to a density of not less than 100 percent of the maximum density as determined by the AASHTO Method T-180. If shown on the Drawings, compact subgrade to a Florida Bearing Value of 75 psi. Unless the subgrade material at the time of compacting contains sufficient moisture to permit proper compaction it shall be moistened as necessary and then compacted. Subgrade material containing excess moisture shall be permitted to dry to the proper consistency before being compacted. The subgrade shall be shaped prior to making the density tests. The required density shall be maintained until the base or pavement has been laid or until the aggregate materials for the base or pavement course have been spread in place.

C. The minimum compacted thickness of the limerock base shall be 12 inches applied in three layers of equal depth unless otherwise shown on the Drawings. The width of the limerock base shall be 3 feet wider than the pavement, 1-1/2 ft. on each side.
D. Before the prime coat is applied, all loose material, dust, dirt or other foreign material which might prevent bond with existing surface shall be moved to the shoulders to the full width of the base by means of revolving brooms, mechanical sweepers, blowers, supplemented by hand sweeping or other approved methods. The glazed finish shall have been removed from the base. The prime coat shall be applied by a pressure distributor so that approximately 0.1 gallons per square yard is applied uniformly and thoroughly to a clean surface.

E. Prior to the application of the surface course, all loose material, dust, dirt and all foreign material which might prevent proper bond with the existing surface shall be removed to the full width of the repair by means of approved mechanical sweepers and supplemented by hand sweeping if required.

F. Apply bituminous tack coat at a rate between 0.02 and 0.10 gallons per square yard. Bituminous material shall be heated as per manufacturer's recommendations.

G. The asphaltic concrete shall be placed in two lifts of three-quarter inches (3/4") each except overlay asphalt which shall be one 3/4" lift.

H. All manhole castings, valve boxes or other utility castings within the area to be surfaced shall be adjusted to the proposed surface elevation by the Contractor. The work shall be accomplished in such a manner as to leave the casting fixed permanently in its correct position.

3.02 PAVEMENT REPAIR

A. All damage to pavement as a result of the work (construction or maintenance) under this contract shall be repaired according to the plans and specifications at the Contractor's cost. Pavement shall be repaired to match the original surface material and original grade, however, the asphalt concrete thickness shall not be less than 1 inch. The repair shall include the preparation of the subgrade, the placing and compacting of the limerock base in 6" maximum lifts, the preparation and priming of the base, the placing and maintaining of the surface reatment, all as specified herein and as shown on the Drawings.

B. The width of all repairs shall extend at least 12 inches beyond the limit of the damage or as shown on the Drawings. The edge of the pavement to be left in place shall be saw cut to a true edge and should provide a clean edge to abut the repair. The line of the repair shall be reasonably uniform with no unnecessary irregularities.

3.03 TESTING

A. The Contractor shall have density, soil bearing, materials and such other tests performed as directed by the Engineer and shall pay the costs of such tests in accordance with Sections 02200 and 02221. The Contractor shall fully cooperate with the testing agency. Should any test indicate that any portion of the materials or workmanship does not comply with these specifications, a retest shall be performed at the Contractor's expense. If the retest confirms the first test, that portion of the work shall be removed and replaced or reworked at no additional cost to the Owner until satisfactory compliance is attained.
3.04 PARKING AND TRAFFIC STRIPES

A. The Contractor shall paint the stripes indicated on the Drawings or disturbed during construction. The paint shall be applied in strict accordance with printed specifications of the manufacturer of the paint being applied, and the latest Florida Department of Transportation Standard Specifications. Unless otherwise indicated, the stripes shall be thermoplastic type with width of 4 inches.

END OF SECTION
SECTION 02735

FORCE MAINS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The work covered by this section and the related sections following consists of providing all labor, equipment, material and supplies and performing all operations required to install the various piping, valves and accessories for Force Mains as specified and shown on the drawings.

B. Related Work Specified Elsewhere:

Section 02222 - Trenching, Backfilling and Compacting

1.02 SUBMITTALS

A. Submittals for the various types of pipe and fittings are specified in the individual sections.

B. Shop drawings or catalog cuts shall be submitted for all valves, boxes and restrained joints.

C. Record drawings shall be submitted in accordance with the requirements of Section 01340 – Submittals, and Section 01700 – Project Closeout. The type of pipe used shall also be noted on the drawings.

D. Pipe evaluations shall be submitted as specified under “Installation”, in this Section.

E. The Manufacturer shall furnish a sworn affidavit that the pipe, fittings and lining furnished under the Contract or Agreement comply with all applicable provisions of the ANSI and/or AWWA Standards.

F. Reports on pressure and leakage tests shall be submitted by the Contractor.

1.03 JOB CONDITIONS

A. No interruptions to sewer service shall be allowed. Should the Contractor find it necessary to deactivate a lift station for a period of time it will be his responsibility to have available an alternative means of disposing of the sewage which would normally be pumped by the lift station. The Contractor shall submit plans and schedules to the Engineer/Architect for approval prior to any shutdowns.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 INSPECTION

A. All pipe shall be subject to inspection at the factory by the Engineer/Architect or Owner. The Contractor shall provide a production schedule in sufficient time so plans can be made for in-plant inspection of the pipe or fittings during production, should it be required.
3.02 TESTS
A. All tests shall be made in the presence of the Owner or Engineer/Architect unless waived in writing. The Contractor shall notify the Engineer/Architect in sufficient time when tests are being conducted to allow for travel time to the manufacturer's plant.

3.03 INSTALLATION OF ABOVE GROUND PIPING
A. Piping shall be installed as shown on the drawings. Flanged joints shall be made up tight, care being taken to prevent undue strain upon pump nozzles, valves, and other pieces of equipment. Piping within structures shall be adequately supported from floors, walls, or ceilings. Supports from the floor shall be by approved saddle stands or suitable concrete piers as shown or approved by the Engineer/Architect. Pipe saddles shall be shaped to fit the pipe with which they will be used and shall be capable of screw adjustment. Concrete piers shall conform accurately to the bottom 1/3 to ½ of the pipe. Piping along walls shall be supported by approved wall brackets with attached pipe rolls or saddles by wall brackets with adjustable hanger rods. For piping supported from above, approved rod hangers of a type capable of screw adjustment after erection of the piping and with suitable adjustable concrete inserts or beam clamps shall be used. Supports shall be located where shown or specified.

B. Unions and Flanges:
   1. Unions and flanges are not, in every case, shown on the drawings but are to be provided where necessary and adjacent to all equipment installed or provided for under this Contract.

C. Wall Sleeves:
   1. Pipe through concrete or masonry walls shall be placed in wall sleeves except where wall pipe is shown on the drawings. Well sleeves shall be standard weight, Class D, of the sizes shown on the drawings. Sleeves through walls and floors on grade shall be of sufficient length to extend through to finished surface. All sleeves shall be of adequate size to permit clearance for pipe movement and proper grading of pipe.

3.04 INSTALLATION OF UNDERGROUND PIPING
A. Excavation, trenching, and backfilling for the installation of underground piping system shall be as specified in Section 02222 – Trenching, Backfilling, and Compacting. Pipe shall be laid in a level trench. Irregularities shall be smoothed out or filled in with sand and tamped. Holed shall be scooped out where the bells occur leaving an entire barrel of the pipe bearing on the pipe bed.

B. Laying of the pipe shall be commenced immediately after the excavation is started, and every means must be used to keep pipe lying closely behind the trenching. The Engineer/Architect may stop trenching when, in his/her opinion, the trench is open too far in advance of the pipe laying operation. Pipe must be laid in the best manner adapted to securing speed and good results. It shall, however, be in accordance with
the manufacturer’s instructions and recommendations. Damaged or unsound pipe or fittings will be removed and replaced by the Contractor at no additional cost to the Owner. Before jointing of the pipe, all lumps, blisters, excess coating material, or oil shall be removed from the bell and spigot ends of the pipe. Force Mains shall be thrust-blocked or restrained to prevent movement of lines under pressure. Restraints or concrete thrust-blocking shall be furnished by the Contractor. Concrete shall be a minimum of 2,500 psi. For ductile iron pipe, at all bends, tees, crosses, wyes, plugs, and reducers as shown in details of typical thrust and anchor block placements on the drawings. The number of feet of pipe with restrained joints necessary for each size pipe shall be as shown on the Standard Detail drawings.

C. Where there is no adequate natural foundation upon which to construct a pipe bed, the pipe shall be constructed on a prepared stabilized subgrade or rock bedding of Class I materials as defined in ASTM D2321. Unsuitable subgrade materials shall be replaced or stabilized as described in Section 02222. Gravel or graded limerock used for pipe bedding, when ordered in writing, shall be paid for under bid item for such material. Where dewatering is required, Class I materials shall be used as described in ASTM D2321.

D. Pipe and fittings shall be strung out along the route of construction with the spigots pointing in the direction of the flow. Pipe shall be placed where it will cause least interference with traffic. Pipe shall be handled by mechanical equipment. Before the pipe is lowered into the trench, it shall be swabbed or brushed out to insure no dirt or foreign material enters the finished line. Trench waters shall be out of the pipe and the pipe kept closed by means of a test plug whenever work is not in progress. The Contractor shall provide the means for dewatering the trench and the cost thereof shall be included in the price for installing the pipe.

E. Deflections from a straight line or grade made necessary by vertical curves or horizontal curves or offsets shall not exceed the manufacturer’s recommendations. If the specified or required alignment requires deflection in excess of those recommended, the Contractor shall either provide special bends as approved by the Engineer/Architect or a sufficient number of shorter lengths of pipe to provide angular deflections within the required limit.

F. All joints shall be watertight and any leaks or defects discovered shall be immediately repaired to the satisfaction of the Engineer/Architect. Any pipe, which had been disturbed after being laid shall be taken up, the joints cleaned, and the pipes properly relaid. Any superfluous material inside the pipe shall be flushed or removed by means of an approved follower or scraper after joints are made. Installation of fittings and pipe joints shall be in strict accordance with the manufacturer’s recommendations.

G. For the protection of exposed reinforcing in anchor blocks, the Contractor shall furnish and apply two coats of Koppers Bitumastic No. 505 protective coating.

H. Before backfilling, the Contractor shall take elevations on the top of the pipe barrel at the 100-foot intervals along the pipe line and at any change in grade. These elevations shall be submitted to the Engineer/Architect.

I. Plastic pipe shall be installed in strict accordance with the provisions of ASTM D2321, including those provisions in respect to compaction of bedding and haunching material. Class IV or Class V materials as defined in ASTM D2321 shall not be used for bedding, haunching or initial backfill.
3.05 MISCELLANEOUS INSTALLATION CONDITIONS

A. Water and Sewer Main Crossing:
   1. Sewers crossing under water mains shall be laid to provide a minimum vertical distance of 18 inches between the invert of the upper pipe and the crown of the lower pipe. Where this minimum separation cannot be maintained, the crossing shall be arranged so that the sewer pipe joints and water main joints are equidistant from the point of crossing with no less than 10 feet between any two joints. Alternatively, the sewer main may be placed in a sleeve or encased in concrete to obtain the equivalent of the required 10-feet separation.
   2. Maintain 10-feet horizontal distance between water main and sewer as a minimum.
   3. Force main crossing water main shall be laid to provide a minimum vertical distance of 18 inches between the outside of the force main and the outside of the water main.

B. Connection to Existing Main:
   1. Where connections are required between new work and existing Force Mains, the connections shall be made in a thorough and workmanlike manner, using proper specials and standard fittings to suit the actual conditions.
   2. In case a connection is made to an existing fitting in the line, the Contractor shall schedule his work so that digging and locating the existing fittings can be completed prior to starting trench work on the line. The Contractor shall verify the dimensions of all pipe before ordering special fittings and couplings.

C. Harnessing:
   1. Where harnessing is shown on the drawings or approved by the Engineer/Architect, all harnessing rods, clamps, bolts, and nuts shall be a coal tar or asphalt base bituminous coating approved by the Engineer/Architect and applied to at least a 4 mil dry thickness.

3.06 FIELD INSPECTION OF SYSTEM

A. The Contractor shall furnish and install suitable temporary testing plugs or caps for the pipe line, all necessary pressure pumps, hose, pipe connections, meters, gauges and other similar equipment, and all labor required, all without additional compensation, for conducting pressure and leakage tests of the new water main and force main. The Owner may, at his own choice, furnish a water meter and a pressure gauge for use in conducting these tests. The Contractor shall procure and pay for all water required for tests and flushing.

B. Tests shall be made between valves and as far as practicable in sections not exceeding one thousand feet long or as approved by the Engineer/Architect. Potable water from an existing water distribution system shall be used. The test pressure for the Force Mains shall be 150psi and this pressure shall be maintained for a period of not less than two hours for uncovered pipes, and for not less than twenty-four hours for pipes, which have been backfilled before tests are made. The amount of water forced into the line during this time shall be determined and this amount shall be
taken as a basis to compute the leakage for twenty-four hours. Pressure shall not vary more than five pounds from the above during the test periods. Allowable leakage shall be computed on the basis of Table 7, Page 16, AWWA Standard C600-82, or the applicable formula for other than 18-foot lengths.

C. Before performing leakage tests, the Contractor shall make every reasonable effort to insure that the section of Force Main being tested is completely full of water and no trapped air pockets existing within the section.

D. All leaks evident at the surface shall be uncovered and repaired regardless of the total leakage as indicated by the test, and all pipes, valves and fittings and other materials found defective under the test shall be removed and replaced at the Contractor’s expense. Tests shall be repeated until leakage has been reduced below the allowable amount.

E. If, in the judgment of the Engineer/Architect, it is impracticable to follow the foregoing procedures exactly for any reason, modifications in the procedure shall be made as approved by the Engineer/Architect. In any event, the Contractor shall be responsible for the ultimate tightness of the piping within preceding requirements.

F. In testing plant piping, it may be necessary to isolate or disconnect certain equipment while testing piping to protect the equipment or accessories. Piping shall not be tested beyond the ratings of the valves or in other items in the pipelines. Where working pressures are not noted, the Engineer/Architect will decide the test pressures required.

3.07 FLUSHING

A. After the Force Mains have been laid and pressure tested, each run of pipe shall be thoroughly flushed so as to remove all debris and foreign matter from the lines. Flushing will ordinarily be done by opening fire hydrants or blowoffs along the pipeline. Where fire hydrants or blowoffs are not available or are of insufficient capacity to permit adequate flushing, the pipe line shall be opened and flumes or piping shall be provided by the Contractor to waste the water to the nearest approved disposal point. Sufficient flushing water shall be introduced into the mains to produce a velocity of not less than 2 ½ feet per second, and this rate of flow shall be continued until the discharge is clear and no evidence of silt or foreign matter is visible.
SECTION 02931
SODDING

PART 1 - GENERAL

1.01 WORK INCLUDED
A. Furnish all labor, materials, equipment and incidentals required to prepare lawn bed and install sodding as shown on contract drawings and as specified herein.
B. Area to receive sodded grass lawns within the landscape limits shown on the drawings except as noted herein shall be as designated on the Drawings.

1.02 SUBMITTALS
A. Provide technical data as specified in Section 01340 for shop drawings on all materials or installation procedures required under this Section.
B. Submit representative topsoil samples for analysis by a private laboratory to determine nutrient deficiencies and outline a proper fertilization program.
C. Submit as provided in Section 01720 certifications required for all sodding supplied.

PART 2 - PRODUCTS

2.01 SOD
A. Sod shall be same as existing of firm texture having a compacted growth and good root development as approved.
B. Sod shall be certified to meet Florida State Plant Board specifications, absolutely true to variety type, and free from weeds or other objectionable vegetation, fungus, insects and disease of any kind.
C. Before being cut and lifted, the sod shall have been mowed 3 times with the final mowing not more than a week before cutting into uniform dimensions.

2.02 SOIL CONDITIONERS
A. Fertilizer:
1. Fertilizer shall be a complete fertilizer, the elements of which are derived from organic sources. Fertilizer shall be a standard product complying with State and Federal fertilizer laws.
2. Percentages of nitrogen, phosphorus and potash shall be based on laboratory tests on soils outlined in Paragraph 1.02B and approved by the Engineer. For purpose of bidding, assume 6% nitrogen, 6% phosphorus and 6% potash by weight. At least 50% of the total nitrogen shall contain no less than 3% water-insoluble nitrogen.

3. Fertilizer shall be delivered to the site, mixed as specified, in the original unopened standard size bags showing weight, analysis and name of manufacturer. Containers shall bear the manufacturer's certificate of compliance covering analysis shall be furnished to the Engineer. Store fertilizer in a weather-proof place and in such a manner that it will be kept dry and its effectiveness will not be impaired.

B. Superphosphate shall be composed of finely ground phosphate rock as commonly used for agricultural purposes containing not less than 20% available phosphoric acid.

PART 3 - EXECUTION

3.01 LAWN BED PREPARATION

A. Areas to be sodded shall be cleared of all rough grass, weeds and debris, and the ground brought to an even grade as approved.

B. The soil shall then be thoroughly tilled to a minimum 8-inch depth.

C. Superphosphate at a rate for bidding purposes of 5 pounds per 1000 square foot and complete fertilizer at a rate for bidding purposes of 16 pounds per 1000 square foot shall be evenly distributed over entire area and cross-diced into a depth of 4-6 inches.

D. The areas shall be brought to a proper grade, free of sticks, stones, or other foreign matter over 1-inch in diameter or dimension. The surface shall conform to finish grade, less the thickness of sod, free of water-retaining depressions, the soil friable and uniformly firm texture.

3.02 SOD HANDLING AND INSTALLATION

A. During delivery, prior to planting, and during the planting of the lawn areas, the sod panels shall at all times be protected from excessive drying and unnecessary exposure of the roots to the sun. All sod shall be stacked during construction and planting so as not to be damaged by sweating or excessive heat and moisture.

B. After completion of soil conditioning as specified above, sod panels shall be laid tightly together so as to make a solid sodded lawn area. On mounds and other slopes, the long dimension of the sod shall be laid perpendicular to the slope. Immediately following sod laying the lawn areas shall be rolled with a lawn roller customarily used for such purposes, and then thoroughly watered.
C. Bring the sod edge in a neat, clean manner to the edge of all paving and shrub areas. Top dressing with approved, clean, weed free, sand may be required at no additional cost to the Owner if deemed necessary by the Engineer.

3.03 MAINTENANCE

A. The Contractor shall produce a dense, well established lawn. The Contractor shall be responsible for the repair and resodding of all eroded or bare spots until project acceptance. Repair sodding shall be accomplished as in the original work except that fertilizing may be omitted.

B. Sufficient watering shall be done by the Contractor to maintain adequate moisture for optimum development of the lawn areas. Sodded areas shall receive no less than 1.5 inches of water per week.

3.04 REPAIRS TO LAWN AREAS DISTURBED BY CONTRACTOR’S OPERATIONS

A. Lawn areas planted under this Contract and lawn areas outside the designated areas damaged by Contractor’s operations shall be repaired at once by proper sod bed preparation, fertilizing and resodding, in accordance with these specifications.

END OF SECTION
SECTION 05500
METAL FABRICATIONS

PART 1 - GENERAL

1.01 SUBMITTALS

A. Shop drawings: Indicate sizes, shapes, and fabrication and installation details for metal fabrications. Indicate anchorage to adjacent surfaces. Indicate shop finish. Where shop primer is required, indicate exact product used.

B. Product data: Submit for manufactured items. Indicate materials, construction, finishes and installation instructions.

C. Welder certification: Submit welders’ qualifications in accord with AWS D1.1-02 and D1.2-02, current within the previous 12 months, for Architect’s information only.

1.02 QUALITY ASSURANCE

A. Allowable tolerances: Machine fabricated field and shop assembled mechanical joints shall fit within ±1/32”. Install freestanding items to ±1/4” of proper position. Sizes of each element of an assembly shall be correct within 1/8”; total size of freestanding assembly shall be correct within ½”.

B. Applicable standards:


2. American Welding Society (AWS):
   a. AWS D1.1-02, "Structural Welding Code -- Steel."
   b. AWS D1.2-02, "Structural Welding Code -- Aluminum."
   c. AWS B2.1-02, "Welding Procedure and Performance Qualification."

3. American Iron and Steel Institute (AISI), standards as referenced herein.

4. Americans with Disabilities Act (ADA).


6. Steel Structures Painting Council (SSPC), standards as referenced herein.

7. Underwriters Laboratories (UL), standards as referenced herein.
C. Qualification of welders:

1. Welders employed on the Work shall have passed qualification tests within the past 12 months in the position for which employed, using test AWS D1.1-02 procedures.

2. Contractor shall require any welder to retake the qualification test when, in the opinion of the Architect, the welder's Work creates a reasonable doubt as to the proficiency of the welder. Requalification tests shall be conducted at no addition expense to the Owner. Recertification shall be made to Architect after the welder has passed the retest.

D. Field measurements: Take field measurements prior to preparation of shop drawings and fabrication, to ensure fitting of Work.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Materials shall be free from defects impairing strength, durability or appearance. Exposed surfaces throughout project shall have the same inherent texture and color for like locations.

B. Fasteners: Fasteners and anchors shall be non-corrosive, non-staining and concealed, except as indicated on approved shop drawings. Exposed fasteners shall be of same materials, color and finish as material to which applied, shall be countersunk and finished flush.

2.02 BASIC MATERIALS

A. Structural steel shapes: Meeting ASTM A36-94.

B. Hot-rolled carbon steel sheets and strips: Meeting ASTM A568-93a and ASTM A570-92 (1993); Grade 40, minimum.

C. Cold-rolled carbon steel sheets: Meeting ASTM A611-94, Grade D, Type 2 and A366-91 (1993).

D. Other steel: Mild Steel.

E. Primer paint for surfaces to receive finish painting: Compatible with required finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Painting section.

F. Primer paint for components which do not receive further finish and components to be embedded into concrete: Organic zinc-rich primer meeting SSPC-Paint 20, Type II.

G. Bituminous coating for separation of dissimilar materials: Cold-applied asphalt mastic meeting SSPC-Paint 12.
H. Cold galvanizing compound: Pre-mixed, organic zinc liquid containing 95 percent zinc in dried film.

2.03 MISCELLANEOUS CONSTRUCTION

A. Provide items indicated or required to complete the work, including but not limited to the following:

1. Operable partitions: Bracing and support for tracks not supplied by partition and manufacturer.

2. Elevators: Coordinate sizes, capacity of items to be supplied with elevator manufacturer:
   a. Sill angles, guide rail and cylinder supports.
   b. Inserts and clips not part of elevator equipment.
   c. Separator beams.
   d. Pit sump cover, with frame, flush with pit floor, designed for light duty strength (pedestrian traffic loads) and with maximum 3/8” wide slotted drainage opening.

3. Toilet room partitions: Provide supports for panels, pilasters and urinal screens in gypsum wallboard partitions. Provide struts and angles anchored to structure to support ceiling hung partitions.

4. Lintels and shelf angles:
   b. Interior: Mild steel.

5. Structural supports for signage.

6. Overhead door frames: Provide welded steel channel jambs and head for overhead door openings.

7. Corner guard angles: 4” by 4” by ¼” by 4'-0” long, located at corners exposed to vehicular traffic and where shown. Anchor with epoxy adhesive.

8. Steel pipe bollards.

9. Hanger rods not provided by other trades: In size and length indicated or required; threaded full length or at ends.

10. Counter support brackets, welded construction.

B. Finish or miscellaneous items: Prime paint, unless otherwise specified.

2.04 FABRICATION

A. Form work true to line and level with accurate angles and surfaces and straight, sharp edges. Ease exposed edges to radius of approximately 1/32". Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

B. Weld corners and seams continuous and in accord with AWS specifications. Grind exposed welds smooth and flush, to match and blend with adjoining surfaces and without weakening base metal. Remove slag from welds before applying shop primer.

C. Formed components: Molded, bent or shaped members shall be formed with clean, sharp arrises, without dents, scratches, cracks and other defects.

D. Provide anchorage of type shown on approved shop drawings, coordinated with supporting structure.

2.05 PROTECTIVE COATINGS

A. Shop primer: Ferrous metal, except galvanized surfaces, shall be cleaned and given one shop coat of shop primer as specified herein:

1. Surface preparation: Clean surfaces after fabrication and immediately prior to shop painting in accord with SSPC SP6, "Commercial Blast Cleaning" or SSPC SP 3 "Power Tool Cleaning".

2. Shop priming:
   a. Shop prime all steel components.
   b. Shop prime surfaces after completion of fabrication.
   c. Apply specified shop primer in accord with manufacturer’s product data and SSPC Painting Systems Specifications to provide a dry film thickness of 2.5 mils.
   d. Coat fabrications and anchors to be built into masonry construction using bituminous coating, 15 mils dry film thickness.
   e. Apply shop primer within four hours after cleaning and before rust-bloom occurs. Paint surface temperatures of five degrees F. above dew point.
   f. Where hot-dip galvanized or zinc-coated metal is specified, metal shall not be shop primed.

B. Galvanizing:
1. Hot-dip galvanizing applied to products fabricated from rolled, pressed and forged steel shapes, plates, bars and strips or zinc coatings on assembled steel products shall comply with ASTM A123-89a, Grade 65.

2. Hot-dip galvanizing applied to products fabricated from steel sheet shall comply with ASTM a653-95, coating Designation G90.

3. All galvanizing shall be done after fabrication.

4. Preparation: Prior to galvanizing, remove dirt, scale, rust, oil, grease and similar debris, including residue resulting from welding and fabrication, by pickling or blasting. Clean, flux and dry materials prior to galvanizing.

5. Following galvanizing, remove roughness, dross, blisters, lumps and runs. Immediately coat bare steel with cold galvanizing compound.

6. Following galvanizing, surfaces to be painted shall be chemically treated for bond in accord with ASTM D2092-86 (1993), Method A.

PART 3 - EXECUTION

3.01 PREPARATION

A. Inserts and anchorages: Furnish inserts and anchoring devices which must be set in concrete for installation of work.

B. Coordinate setting drawings, diagrams, templates, instructions and directions for installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete construction.

C. Shop assembly: Preassemble items in shop to greatest extent practicable to minimize assembly at project site. Disassemble units only to extent necessary for shipping and handling limitations. Mark units for reassembly.

D. Where galvanized components must be field welded to supports, remove galvanizing prior to welding.

3.02 INSTALLATION

A. Fastening to in-place construction: Provide anchorage devices and fasteners to secure in-place construction; including threaded fasteners for concrete inserts, toggle bolts and through-bolts.

B. Cutting, fitting and placement: Perform cutting, drilling and fitting to install work. Set work in location, alignment and elevation, plumb and level, true and free of rack, measured from established lines and levels. Install work in accord with approved shop drawings.

C. Fitting: Fit exposed connections to form hairline joints. Field weld connections which cannot be shop welded. Grind joints smooth.
D. Stair nosings: Anchor stair nosings to stair treads with wing anchors spaced 3" maximum from each end of nosing and at 1'-0" o.c., maximum, along length. Attach with flat-head machine screws. Finished installation shall be level with stair tread.

E. Shelf angles: Install shelf angles in locations indicated on drawings. Do not locate joints in shelf angles within 8" of a penetration or opening. Seal joints in shelf angles using silicone sealant as specified in Sealants and Caulking section.

F. Corner guards and bollards:
   1. Provide steel corner guards at all exterior corners indicated. Field paint using epoxy-polyamide paint specified in Painting section.
   2. Provide steel bollards at locations shown.

G. Repair of galvanized surfaces: After installation, clean surfaces from which galvanizing was removed during installation in accord with SSPC SP3, "Power Tool Cleaning." Coat surfaces with cold galvanizing compound, 3.0 mils minimum dry film thickness.

H. Repair of primed surfaces: After installation, clean damaged areas in shop primer to the same standards as required for the shop coat and paint using identical primer.

I. Field painting: For surfaces to receive field paint finish, prepare and paint in accord with the requirements of the Painting section.
SECTION 09900

PROTECTIVE COATINGS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. This Section covers the work required to provide all labor, materials, equipment and incidentals to perform all of the necessary surface preparation and painting required to complete this contract in its entirety.

B. It is the intent of these Specifications to paint all concrete, exposed miscellaneous metal, pipe, fittings, valves, equipment and all other work required to be painted unless otherwise specified. Minor items omitted in the schedule of work shall be included in the work of this Section where they come within the general intent of the specifications as stated herein.

C. The following surfaces or items are "NOT" required to be coated:
   1. Aluminum: gratings, checkered plates, hatches, handrails, toe boards, stairways and walkways
   2. Stainless steel, brass, bronze, and aluminum other than exposed tubing
   3. Piping buried in the ground or embedded in concrete
   4. Ducts, pipes and other miscellaneous items covered with insulation or plastic coated
   5. Concealed surfaces of pipe or crawl spaces
   6. Finish hardware
   7. Nonferrous architectural metals, unless specifically noted otherwise
   8. Packing glands and other adjustable parts and nameplates of mechanical equipment
   9. Exterior concrete slabs and equipment

1.02 RELATED WORK

A. Individual specification sections.

ABBREVIATIONS

The abbreviations and definitions listed below, when used in this Section, shall have the following meanings:

- ANSI  American National Standards Institute
- ASTM  American Society of Testing Materials
- AWWA  American Water Works Association
- DFT   Dry Film Thickness
- FPP   Fiberglass Reinforced Plastic
- HCI   Hydrochloric Acid
- MDFT  Minimum Dry Film Thickness
- MDFTP  Minimum Dry Film Thickness Per Coat
1.03 SUBMITTALS

A. Submittals will be made with the coating system data sheet included at the end of this section.

B. The following shall be submitted for each proposed coating system: manufacturer’s specifications, surface prepared details, application procedures, technical data sheets, and dry film thickness or coverage.

C. Unless otherwise specified, hereinafter and before any painting work is started prepare with type of paint and application specified, and on similar substrate, to which paint is to be finally applied, samples not less than 8” in size.

D. Furnish additional samples as required until colors, finishes and textures are acceptable. Retain accepted samples to be used as the quality standard for final finishes.

E. Before proceeding with the work under this Section, finish one complete space or item of each color scheme required showing selected colors, finishes and textures are acceptable. Retain accepted samples to be used as the quality standard for final finishes.

F. Schedule of Painting Operations: The Contractor shall submit for review a complete schedule of painting operations 30 days from the notice to proceed.

1.04 QUALITY ASSURANCE

A. The paint manufacturer shall provide a representative to visit the job site at intervals during surface preparation and painting as may be required for product application quality assurance and to determine compliance with manufacturer’s instructions and these Specifications, and as may be necessary to resolve field problems attributable to, or associated with, the manufacturer’s products furnished under this Contract.

B. A site visit report shall be prepared and submitted by paint manufacturer’s representative documenting compliance with the manufacturer’s recommended applications.
1.05 INSPECTION

A. The Contractor shall give the Engineer a minimum of three days advance notice of the completion of any surface preparation work or start of coating application work.

B. Before application of the prime coat and each succeeding coat, all surfaces to be painted shall be inspected by the Engineer. Any and all defects of deficiencies shall be corrected by the Contractor before application of any subsequent coating.

C. Coating applications shall be checked for required MDFT as per these specifications. All coated surfaces failing to meet the MDFT requirements shall be rejected.

D. For all coatings subject to immersion, full cure must be obtained for the completed system. Consult the coatings manufacturer's written instructions for these requirements. The coatings shall not be immersed for any purpose until completion of the curing cycle.

E. Inspection by the Engineer of the waiver of inspection of any particular portion of the work shall not be construed to relieve the Contractor of his responsibility to perform the work in accordance with these specifications.

1.06 PAINT DELIVERY AND STORAGE

All materials shall be new and shall be delivered to the project site in unopened containers that plainly show, at the time of use, the designated name, date of manufacturer, color, and name of manufacturer. Paints shall be stored in a suitable protected area that is heated or cooled as required to maintain temperatures within the range recommended by the paint manufacturer.

1.07 PROJECT SITE CONDITIONS

The location of this project is Broward County, Florida requires observance and conformance with EPA Volatile Organic Compound (VOC) restrictions. EPA limits the content of VOC's in painting materials to 2.5 lb/gallon. Information regarding the VOC content of proposed paints will be required during submittals.

1.08 WARRANTY

Contractor shall warrant to the Owner and guarantee the work under this Section against defective workmanship and materials for a period of two years commencing on the date of Final Acceptance of the Work. This warranty does no alleviate the Contractor or supplier of implied or other specified or written warranties for long term product quality.

PART 2 - PRODUCTS

2.01 GENERAL

Products containing lead will not be allowed. Oil shall be pure boiled linseed oil.
2.02 PAINT MATERIALS

A. Products shall be as manufactured by Tnemec Company, Inc., Kerneos Alumininate Technologies or approved equals.

B. The following paint products are by Tnemec Company, Inc. and Kerneous, as applicable, and are used for the basis of establishing the desired quality expected for the project.

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Company</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal Tar Epoxy</td>
<td>Tnemec</td>
<td>46H-413</td>
</tr>
<tr>
<td>Polyamine Epoxy (Non Potable)</td>
<td>Tnemec</td>
<td>Series 104 H.S. Epoxy</td>
</tr>
<tr>
<td>Vinyl Ester</td>
<td>Tnemec</td>
<td>Series 120 Vinester</td>
</tr>
<tr>
<td>Polyamide Epoxy</td>
<td>Tnemec</td>
<td>Series 66Hi-Build Epoxoline</td>
</tr>
<tr>
<td>Acrylic Polyurethane</td>
<td>Tnemec</td>
<td>Series 73 Endura-Shield</td>
</tr>
<tr>
<td>Mortar</td>
<td>Kerneos</td>
<td>Supercoat PG</td>
</tr>
</tbody>
</table>

2.03 COLORS

A. Provide as selected by the Owner.

B. Formulate with colorants free of lead, lead compounds, or other materials which might be affected by presence of hydrogen sulfide or other gas likely to be present at the project.

C. Proprietary identification of colors if for identification only. Any authorized manufacturer may supply matches.

2.04 TESTING GAUGES

A. Furnish a magnetic type dry film thickness gauge, to test coating thickness specified in mils, as manufactured by:

1. Nordson Corp., Anaheim, CA, Mikrotest
2. Or equal

B. Furnish an electrical holiday detector, low voltage, wet sponge type to test finish coat, except zinc primer, high-build elastomeric coatings, and galvanizing, for holidays and discontinuities as manufactured by:

1. Tinker and Rasor, San Gabriel, CA, Model M-1
2. Or equal

C. Furnish a high voltage holiday detector for elastomeric coatings in excess of 25 mils dry film thickness. Unit to be as recommended by the coatings manufacturer.
PART 3 - EXECUTION

3.01 PROTECTION OF SURFACES NOT TO BE PAINTED

A. Mask or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates and other surfaces not intended to painted which cannot be removed.

B. Provide drop cloths to prevent paint materials form falling on or marring adjacent surfaces.

C. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting processes. Openings in motors shall be masked to prevent paint and other materials from entering motors.

3.02 ENVIRONMENTAL CONDITIONS

Coatings shall not be applied in temperature exceeding the manufacturer’s recommended maximum and minimum allowable, nor under adverse conditions such as dust, smoke-laden atmosphere, damp or humid weather.

3.03 SAFETY

A. Coating shall be performed in strict accordance with the safety recommendations of the coating manufacturer; with the safety recommendations of the national Association of Corrosion Engineers contained in the publication, Manual for Painter Safety; Federal, state and local agencies having jurisdiction.

B. Ultimate responsibility for safety is Contractor’s.

3.04 PREPARATION OF SURFACES

A. All surfaces to be coated shall be prepared as specified herein and shall be dry and clean before coating. Specific surface preparation shall be specified for the individual coating systems.

B. Steel shall be blasted unless otherwise specified. Blasting shall be done with a centrifugal wheel or compressed air blasting equipment, using proper abrasives to attain an average profile depth of 1.5 mils.

Do not re-use sand or flint abrasives. Short abrasives must be thoroughly clean of contamination before re-use. Blow dust and grit from surface with clean, dry air. Coat within 8 hours or before rust contamination occurs.

C. All concrete shall have cured for 28 days.

3.05 COATING SYSTEM INDEX

The following is a general index to the coating system description described herein:
3.06 COATING SYSTEMS

A. System No. 1 Exterior of New Concrete Structures, Valve Vault, Wet Well

Surface Preparation: All curing oils, form oils, laitance, soluble salts and loose concrete must be removed. Concrete must be dry and thoroughly clean before coatings.

Prime Coat: None required.

Top Coat: Coal tar epoxy at 8.0 mils DFT per coat.

MDFT: 16 mils DFT for two-coat system. Allow minimum of 24 hours drying time between coats.

Color: First Coat – Red
Second Coat – Black

B. System No. 2 – Interior of New Valve Vaults, Air Release Structures

Surface Preparation: Concrete: All curing oils, form oils, laitance, soluble salts and loose concrete must be removed. Concrete must be dry and thoroughly clean before coatings. Concrete shall be cured 28 days, brush off blast.

Filler/Surfacer: Concrete substrate surface with cracks and/or voids greater than ½ in depth or width or areas where underlying aggregate has been exposed shall be patched with filler and surfacer. Material shall be applied in accordance with the manufacturer's application instructions.

Prime Coat: Vinyl Ester 12.0 to 18.0 mils DFT or polyamide epoxy, Tnemec Series 66 or 69 Hi-Build, 4 mils DFT.

Top Coat: Vinyl Ester 12.0 to 18.0 mils DFT or polyamide epoxy, Tnemec Series 66 or 69 Hi-Build, 8 mils DFT.

MDFT: Minimum 30 mils of DFT for two-coat vinyl ester system or 12 mils MDFT polyamide epoxy system. Time between coats and method of application shall be as per manufacturer's written instructions.
Color: First Coat – Beige (5002)
Second Coat – Gray (5001)

C. System No. 3 – Exposed Metal – Highly Corrosive
Surface Preparation: Abrasive blast clean to an SSPC-SP10 (near white metal).
Prime Coat: Polyamine epoxy at 6.0 to 8.0 mils DFT.
Top Coat: High build acrylic polyurethane at 2.0 to 4.0 mils DFT.
MDFT: 9 mils DFT for two-coat system.
Color: As selected by Owner from manufacturer’s standard available colors.

D. System No. 4 – Submerged Metal – Domestic Sewage, Pump Station Wet Well Piping
Surface Preparation: Abrasive blast or centrifugal wheel blast, SSPC-SP5.
Prime Coat: Polyamide, anti-corrosive, epoxy primer, 1 coat, 2.5 MDFT.
Top Coat: Coat-tar epoxy, 2 coats, 16 MDFT.
MDFT: 18.5 mils MDFT for system.

E. System No. 5 – Exposed Metal – Moderate Corrosive Conditions, Valve Pit Piping and Valves
Surface Preparation: Abrasive blast or centrifugal wheel blast, SSPC-SP10.
Prime Coat: Polyamide, anti-corrosive, epoxy primer, 1 coat, 2.5 MDFT.
Top Coat: Polyamide epoxy, Tnemic Series 66 or 69, 2 coats, 8 MDFT
MDFT: 10.5 mils DFT for three coats.

F. System No. 6 – Concrete Lining – Pump Station Wet Well, and Manholes
Surface Preparation: All curing oils, form oils, laitance, soluble salts and loose concrete must be removed. Concrete must be saturated with water prior to application of the lining materials.
Inflow Prevention: Existing manholes may need rapid setting crystalline enhanced hydraulic cement product specifically formulated for infiltration control that shall be used to stop minor flows. The material shall have the following strength requirements: Compressive Strength (ASTM C597B) 600 psi (24 hours) 1,000 psi (7 days) and Bond Strength (ASTM C321) 30 psi (1 hour), 80 psi (1 day).
Lining: See section 03769 Sewage Pump Station Structure and Manhole Rehabilitation.
Curing: If environment is not moist enough for natural curing, the Contractor may be required to apply a curing compound per the requirements of ASTM C309.

G. System No. 7 – Existing Concrete Exposed

Surface Preparation: Abrasive blast, 4,000 psi
Coating: 3 coats, Polyamide epoxy, Tnemec Series 66 or 69 Hi-Build Epoxoline.

MDFT: 12 mils DFT for three-coat application.

3.07 UNIDENTIFIES SURFACES

Any surfaces not specifically named in the schedule and not specifically accepted shall be prepared, primed and coated in the manner and with material consistent with these Specifications. The Engineer shall select which of the manufacturer's products, whether the type is indicated herein or not, shall be used for such unnamed surfaces. The painting shall be done within the scope of the contract.

3.08 WORKMANSHIP

A. On metal surfaces apply each coat of paint at the rate specified by the manufacturer to achieve the minimum dry mil thickness required. If material has thickened or must be diluted for application by spray gun, the coating shall built up to the same film thickness achieved with undiluted material. One gallon of paint as originally furnished by the manufacturer shall not cover a greater area when applied by spray gun than when applied unthinned by the application of an additional coat(s). On masonry, application rates will vary according to surface texture; however, in no case shall the manufacturer's stated coverage rate be exceeded. On porous surfaces, it shall be the painters responsibility to achieve a protective and decorative finish either by decreasing the coverage rate or applying additional coats of paint.

B. All safety equipment shall be painted in accordance with OSHA Standards as approved.

C. Materials shall be mixed in proper containers of adequate capacity. All materials shall be thoroughly stirred before use and shall be kept stirred while using. No unauthorized thinners or other materials shall be added to any paint.

D. Only skilled painters shall be used on the work and specialists shall be employed where required.

E. Steel members, metal castings, mechanical and electrical equipment and other metals which are shop primed before deliver at the site will not require a prime coat on the job. All piping and other bare metals to be painted shall receive one coat of primer before exposure to the weather, and this prime coat shall be the first coat as specified in the painting schedule.
F. Finish surfaces shall not show brush marks or other irregularities. Undercoats shall be thoroughly and uniformly sanded with No. 00 sandpaper or equal to remove defects and provide a smooth, even surface.

G. Before final acceptance of the work, all damaged surfaces of coating shall be cleaned and repainted as directed by the Engineer.

3.09 APPLICATION SCHEDULE

A. **System No. 1 – Exterior of New Concrete** – This system shall be used on the exterior of all new pre-cast concrete valve vaults, manholes, and constructed wetwell.

B. **System No. 2 – Interior of New Valve Vaults and Air Release Structures** – This system shall be used in the interior of all new concrete valve vaults. Pre-cast concrete shall be coated prior to installation. Coating shall extend through the pre-cast joints.

C. **System No 3 – Exposed Metal – Highly Corrosive** – This system shall be used on all metal surfaces exposed to weather including equipment, conduits, piping, exposed metal frames and elsewhere as scheduled. Galvanized piping and aluminum hatches do not require painting.

D. **System No. 4 – Submerged Metal – Domestic Sewage, Pump Station Wet Well Piping** – This system shall be used for wet well piping, wet well ferrous metals.

E. **System No. 5 – Exposed Metal – Moderate Corrosive Conditions, Valve Pit Piping and Valves** – This system shall be used for interior piping, structural steel and interior dry pit metals.

F. **System No. 6 – Concrete Lining – Pump Station Wet Well, and Manholes** – This system shall be used in wet well and manholes. Existing manholes to be rehabilitated as specified.

G. **System No. 7 – Existing Concrete Exposed** – This system shall be used on the headworks structure area as specified in the contract drawings.

3.10 CLEANUP

A. It shall be the responsibility of the Contractor to collect and dispose of property, all waste materials from the site in accordance with all requirements of the Federal, state, and local environment protection agencies.

B. At completion of the work, remove all paint where it has been spilled, splashed, splattered, sprayed, or smeared on all surfaces, including glass, light fixtures, hardware, equipments, painted and unpainted surfaces.

C. After completion of all paintings, the Contractor shall remove from the job site all painting equipment, surplus materials and debris resulting from this work.
3.11 MANUFACTURER’S SERVICE

Furnish paint manufacturer representative to visit job site at intervals during surface preparation and painting as may be required for product application quality assurance, and to determine compliance with manufacturer's instructions and these specifications, and as may be necessary to resolve field problems attributable to, or associated with, manufacturer's products furnished under this Contract.

3.12 COATING SYSTEM DATA SHEET

To be included with submittal. See form on next page.
COATING SYSTEM DATA SHEET
(to be included with submittal)

Coating System Number (From Spec): ________________________________

Coating System Title (From Spec): ________________________________

Coating Supplier Name & Address: __________________________________

Local Representative Name & Address: ________________________________

Manufacturer Representative Authorized to Certify Proper Installation Name & Address:

Surface Preparation: ____________________________________________

<table>
<thead>
<tr>
<th>Coating Material (Generic)</th>
<th>Product Number/Name (Proprietary)</th>
<th>Coats/Minimum Coverage</th>
<th>Color</th>
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Notes:

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SECTION 13300

CONTROL SYSTEM GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Work includes engineering, furnishing, installing, testing, documenting, and placing in operation the complete Instrumentation and Control Systems or Control System (CS). The work is specified in this Section and further detailed in the following sections:

1. Section 13310 - Field Instruments
2. Section 13315 - Control Panels
3. Section 13320 - Control System

B. The overall system general requirements are given in this section. These requirements apply to each additional section of these specifications as noted herein and as specified in the associated sections.

C. Instrumentation and control systems for this project are intended to be supplied completely under this section. However, some special control devices specifically called out in other specification sections is to be part of those sections, furnished with that equipment. The instruments and controls shall, however, be furnished in conformance to and in coordination with, this section.

D. A SYSTEM INTEGRATOR is to be retained by the CONTRACTOR and is to have overall responsibility for designing, furnishing, interfacing, adjusting, testing, documenting, and starting-up the various CS equipment described in the Contract Documents. The CONTRACTOR is to have overall responsibility for making sure the various systems, trades, suppliers, vendors, subcontractors, etc. come together as a complete coordinated system that will reliably perform the specified functions. The CONTRACTOR shall provide written notification of the intended SYSTEM INTEGRATOR at bid time.

E. The SYSTEM INTEGRATOR shall provide all equipment, materials, programming, software, calibrations and services that are required to successfully interface and interconnect the system and any other control systems and associated equipment that are specified or designated in any drawings or provisions of these specifications for the purpose of providing a fully integrated and functional control system.

F. The SYSTEM INTEGRATOR shall be CC Control Corp., Champion Controls, or Custom Controls Technology, Inc. No other SYSTEM INTEGRATORS will be considered.

G. The CONTRACTOR shall ensure that the SYSTEM INTEGRATOR coordinates closely with suppliers of other specialty equipment.

1.02 DIVISION OF WORK

A. It is the ultimate responsibility of the CONTRACTOR to furnish a complete and fully operable CS that reliably performs the specified functions. The CONTRACTOR is to assume full responsibility for additional costs, which may result from unauthorized
deviations from the specifications. The CONTRACTOR is to establish the actual division of work with the minimum requirements as specified herein.

1. The SYSTEM INTEGRATOR shall be responsible for:
   a. Panel layouts, wiring, and PLC programming
   b. All hardware and software submittals
   c. The SYSTEM INTEGRATOR shall develop the panel shop drawings, wiring diagrams, plumbing diagrams, PLC, and all other submittals defined herein and in the specification sections identified in paragraph 1.01A hereof. Coordination with the CONTRACTOR and other subcontractors shall be the responsibility of the SYSTEM INTEGRATOR.
   d. The final Lift Station system operation and reliability.
   e. The final demonstration tests and training shall be under the on-site supervision of the SYSTEM INTEGRATOR.
   f. The CS warranty period shall be through the SYSTEM INTEGRATOR.
   g. Ordering, fabrication, assembly, delivery, and start-up of the CS
   h. All panel fabrication shall be performed at the SYSTEM INTEGRATOR's shop. The SYSTEM INTEGRATOR's personnel shall perform the system checkout tests for the CS.
   i. Providing any special manufacturer's cables as required.
   j. Designing the final installation and connection requirements of the CS at the jobsite through development of interconnection diagrams.
   k. Coordinating all interface requirements with mechanical and electrical system integrators and furnish any signal isolation devices that might be required in order to insure compatibility between all equipment.
   l. Verifying correctness of all final power and signal connections to the CS.
   m. The SYSTEM INTEGRATOR shall make final adjustments to, and calibrate all, field elements provided with the CS. Ensuring that:
      1) All components provided under this section are properly installed.
      2) The proper type, size, and number of control wires with their conduits and junction boxes are provided and installed, and
      3) Proper electric power circuits are provided for all components and systems.

2. The CONTRACTOR shall be responsible for:
   a. Including within the ELECTRICAL SUBCONTRACTOR's scope:
      1) The termination of field and power wiring to control panels and field elements. Termination shall be made in accordance with final accepted interconnection diagrams developed by
the SYSTEM INTEGRATOR. The electrical subcontractor shall mark on the interconnect diagram the field wire numbers used for each termination point. The SYSTEM INTEGRATOR shall finalize the interconnect diagrams by including these field wire numbers in the final as built version.

2) Installing all network cables, including fiber optic cable, interconnecting PICS (Process Instrumentation Control System) supplied equipment.

3) Installing any special manufacturer’s cables furnished by the SYSTEM INTEGRATOR.

4) Physical installation of control panels.

b. Including within the MECHANICAL SUBCONTRACTOR’s scope

1) Installation of any field instrumentation. Installation shall be made in accordance with the manufacturer’s recommendations and under the direction of the SYSTEM INTEGRATOR.

c. Equipment storage and protection until installed following the storage and handling instructions recommended by the SYSTEM INTEGRATOR. Anti-static and winterization requirements shall be per the SYSTEM INTEGRATOR’s instructions and the SYSTEM INTEGRATOR shall periodically verify that these instructions are followed.

d. Incorporating all necessary components into the system.

e. Ensuring that the SYSTEM INTEGRATOR coordinate work with other Divisions and Sections of the Specifications.

f. Requiring the SYSTEM INTEGRATOR to observe and advise on the installation of equipment furnished by SYSTEM INTEGRATOR and installed by Contractor to the extent required to certify, with the operational check-out tests, that the equipment will perform as required.

g. Ensuring that information on equipment provided under other Divisions and needed by the SYSTEM INTEGRATOR to coordinate the CS is provided in a timely manner.

h. Equipment found to be defective prior to system acceptance shall be replaced and installed at no additional cost to the OWNER.

i. In the bid price, the CONTRACTOR shall include obtaining the services of authorized field personnel from the manufacturers of specialty instruments, and from the suppliers of application software packages. These personnel shall be on site to supervise installation, start-up, and checkout of the respective portions of the CS.

3. The OWNER shall be responsible for:

a. Network communications programming, and computer system application software, setup, computer hardware configuration drawings, layouts, software, and documentation between lift station and HMI (Human Machine Interface).
b. All application software configurations, including modification of all operator interface screens, reports, and database(s) to incorporate new Lift Station.

c. The integration of the system, including the PLC networking, and computer system network.

d. Furnishing of all data highway, fiber optic, and network cables and associated taps, drops etc.

1.03 RELATED WORK

A. Division 15 – Mechanical. Installation of all mechanical piping and fittings, as well as in-line instruments supplied with and/or for the CS.

B. Division 16 – Electrical. All conduits are provided and installed under Division 16, Electrical. With the exception of certain specified networking and special manufacturer’s cables, all wiring and cables are provided and installed under Division 16, Electrical. Division 16 also covers physical installation of the control panels supplied with and/or for the CS.

C. Field devices, such as motorized valves, pump motors, solenoid valves, etc. and local control panels for specialized subsystems, such as chemical feed systems, etc. are supplied and installed under other Divisions contained in these Specifications.

1.04 SUBMITTALS

A. Furnish, as prescribed under the General Requirements, all required submittals covering the items included under this section and its associated sections of the work.

B. Submit complete, neat, orderly, and indexed submittal packages. Handwritten diagrams are not acceptable and all documentation submittals shall be made using CADD generated utilities as specified herein.

C. Partial submittals or submittals that do not contain sufficient information for complete review or are unclear will not be reviewed and will be returned by the ENGINEER as not approved.

D. Provide all shop-drawing submittals on disk in PDF format.

E. Design Related Submittals: Provide individual shop drawing submittals as further defined in each specification section defining the CS. Provide the following additional submittals covering the complete system:

1. Loop Diagrams. Consisting of complete wiring and/or plumbing diagrams for each control loop, including all existing loops, showing all terminal numbers, the location of the dc power supply, the location of any booster relays or common dropping resistors, surge arrestors, etc. The loop diagrams shall meet the minimum requirements of ISA S5.4, plus divide each loop diagram into four areas for identification of element locations: CS I/O point(s), panel face, back-of-panel, and field, respectively. On each diagram present a tabular summary of:

   a. The output capability of the transmitting instruments

   b. The input impedance of each receiving instrument
c. An estimate of the loop wiring impedance based on the wire sizes and lengths shown
d. The total loop impedance
e. Reserve output capacity

2. **System Interconnect Diagram.** Showing all connections required between component parts of the items covered in this section and between the various other systems specified in this Contract. Number all electrical terminal blocks and field wiring. Identify each line at each termination point with the same number. Do not use this number again for any other purpose in the complete control scheme.

F. **Test Procedures.** Submit the Test Procedures to be followed during all system testing. Procedures shall include test descriptions, forms, and check lists to be used to control and document the required tests.

1. Prior to the preparation of the detailed test procedures, submit outlines of the specific proposed tests. Submittals shall include examples of the proposed forms and check lists that will be used by the SYSTEM INTEGRATOR during the system testing.

2. After the preliminary test procedure submittals have been reviewed by the ENGINEER and returned stamped either "Approved" or "Approved as Noted, Confirm", the SYSTEM INTEGRATOR shall submit the proposed detailed test procedures for ENGINEER approval. Following this, the system tests may be started.

3. Upon completion of each required test, document the test by submitting a copy of the signed off test procedures to the ENGINEER.

G. **Training Plan.** The SYSTEM INTEGRATOR shall submit a training plan which includes:

1. An overview of the training plan, explaining why specific courses are proposed.
2. Definitions of each course.
3. Specific course attendance.
4. Schedule of training courses including dates, duration, and locations of each class.
5. Resumes of the instructors who will actually implement the plan.

H. **Spares, Expendables, and Test Equipment Lists Submittal.** This single submittal shall contain separate sections for each Subsystem each including:

1. A list of, and descriptive literature for, spares, expendables, and test equipment as specified in the individual Specification Sections covering the CS.

2. A separate list of, and descriptive literature for, additional spares, expendables, and test equipment recommended by the SYSTEM INTEGRATOR.

3. Unit and total costs for the additional spare items recommended for each subsystem.
4. Storage instructions for all spare parts.

1.05 FINAL SYSTEM DOCUMENTATION

A. After the demonstration tests have been completed and as a part of the final acceptance requirements, submit the CS record drawings. Record drawings corrected for any changes that may have been made up through Substantial Completion shall include:

1. System block diagram
2. Instrument loop wiring diagrams
3. Panel wiring diagrams covering the complete panel including any components retained from the existing system.
4. Panel elevations
5. Interconnection diagrams showing terminal numbers at each wiring termination

B. Record drawings shall be developed or converted to the latest version of AutoCAD. Provide two copies of all AutoCAD files on separate Compact Disks. Provide two hard copies of drawings in 11 x 17 inch format. Provide two copies of record drawings in PDF format.

C. Operating and Maintenance (O&M) Manuals: Provide the specified number of complete sets of three-ring bound O&M manuals in accordance with Division 1. Provide separate manuals for each Specification Section, clearly marked. Include descriptive material, drawings, and figures bound in appropriate places. Provide two CDs each containing the complete O&M manual in PDF format. Include:

1. Cross-references to 3rd party O&M manuals. These references shall be specific to a particular page or section and not merely a general reference.
2. Additional operating and maintenance instructions in sufficient detail to facilitate the operation, removal, installation, adjustment, calibration, and maintenance of each component provided with the CS.
3. Internal wiring diagrams (not already shown on the panel wiring diagram record drawings) for all components provided in the CS that clearly show all terminal block number designations and wire numbers.
4. All the submittal data for each component from the approved shop drawing submittals with corrections made on approved as noted items.

D. Refer to individual specification sections for final documentation requirements that are in addition to the above.

1.06 QUALITY CONTROL

A. The SYSTEM INTEGRATOR shall meet all of the requirements of these specifications, and, unless specifically stated otherwise, no prior acceptance of any subsystem, equipment, or materials has been made.

B. Component equipment shall be as supplied by one of the manufacturers named in the individual specification sections or approved equal. The design of the PICS is based on the first-named manufacturer's equipment if there is a difference.
C. All equipment furnished by the SYSTEM INTEGRATOR shall be of the latest and most recent design and shall have overall accuracy as guaranteed by the manufacturer.

D. To facilitate the OWNER's operation and maintenance, products shall be of the same major instrumentation MANUFACTURER, with panel-mounted devices of the same type and model as far as possible.

E. In order to insure the interchangeability of parts, the maintenance of quality, the ease of interfacing between the various subsystems, and the establishment of minimums with regard to ranges and accuracy, strict compliance with the above requirements shall be maintained.

F. The SYSTEM INTEGRATOR shall designate a single point of contact for interface with the ENGINEER on this project. The ENGINEER reserves the sole right to approve or reject this point of contact.

G. The SYSTEM INTEGRATOR shall provide, on-site, an experienced project engineer to supervise and coordinate all of the on-site CS activities. An experienced technician may be provided to assist the project engineer in field element installation, field calibration, and checkout tests. The SYSTEM INTEGRATOR's project engineer shall be on-site during the period required to effect all of the critical on-site activities related to the CS, particularly the software debugging, PICS training, and witnessed testing activities.

H. The SYSTEM INTEGRATOR's selected project personnel shall meet the following requirements:

   1. Project engineer shall have at least 10 years' experience in installing similar systems and shall have a minimum of secondary education in the field of electronics or similar technical discipline.

   2. Project technician assisting the project engineer for field element calibration and checkout shall have at least five years experience in installing similar systems.

   3. Key staff resumes shall be submitted for ENGINEER's approval with the Project Plan as further detailed under submittals.

1.07 STANDARDS

A. The design, testing, assembly, and methods of installation of the wiring materials, electrical equipment and accessories proposed under this Contract shall conform to the National Electrical Code and to applicable state and local requirements. UL listing and labeling shall be adhered to under this Contract.

B. Any equipment that does not have a UL, FM CSA, or other approved testing laboratory label shall be furnished with a notarized letter signed by the supplier stating that the equipment furnished has been manufactured in accordance with the National Electrical Code and OSHA requirements.

C. Any additional work needed resulting from any deviation from codes or local requirements shall be at no additional cost to the OWNER.

D. Instrument Society of America (ISA) and National Electrical Manufacturers Association (NEMA) standards shall be used where applicable in the design of the CS.
E. All equipment used on this project to test and calibrate the installed equipment shall be in calibration at the time of use. Calibration shall be traceable to National Institute of Standards (NIS - formally NBS) calibration standards.

1.08 WARRANTY AND GUARANTEES
A. The SYSTEM INTEGRATOR shall furnish to the OWNER a written guarantee in accordance with Division 1.
B. The SYSTEM INTEGRATOR shall guarantee all equipment whether or not of his own manufacture.

1.09 SPARES AND EXPENDABLES
A. Obtain from the manufacturer(s) and provide the recommended critical spare parts as part of the work. Refer to the individual requirements listed in the associated specification sections for the CS for specific parts lists to be provided as a minimum. The spare parts are the property of the OWNER.
B. Obtain from the manufacturer(s) and furnish any special tools, calibration equipment and testing apparatus required for the proper adjustment and maintenance of the material provided.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SEQUENCE OF WORK
A. Coordination Meetings. In order to ensure timely performance of the Contract and the system’s conformance with these specifications, coordination meetings shall be held at the OWNER’s engineering office. The first meeting will be held 30 days after award of the Contract to the CONTRACTOR. The CONTRACTOR and SYSTEM INTEGRATOR shall provide for their attendance at this meeting in their quotation. A schedule for additional coordination meetings (approximately one each month) will be derived at this initial meeting for periodic update, coordination, and conflict resolution during the project duration.

B. Prerequisite Activities and Lead Times. Do not start the following key project activities until the listed prerequisite activities have been completed and lead times have been satisfied:
1. Hardware Purchasing, Fabrication, and Assembly: Associated design related submittals completed (no exceptions, or approved as noted).
2. Shipment: Completion and approval of all design related submittals.
4. OWNER Training: Owner Training Plan completed and O&M manuals delivered.
5. Demonstration Tests: Operational Check-out Tests, Startup, OWNER Training, and Demonstration Test Procedures must be complete. Give 4 weeks’ notice prior to the planned test start date.
3.02 PRODUCT HANDLING

A. Store and protect equipment until installation following the storage and handling instructions recommended by the equipment manufacturers. Place special emphasis on proper anti-static protection of sensitive equipment.

B. Protection During Construction. Throughout this Contract, provide protection for materials and equipment against loss or damage and from the effects of weather. Prior to installation, store items in indoor, dry locations. Provide heating in storage areas for items subject to corrosion under damp conditions. Provide covers for panels and other elements that may be exposed to dusty construction environments. Specific storage requirements shall be in accordance with the SYSTEM INTEGRATOR's recommendations.

C. Corrosion Protection. Protect all consoles, panels, enclosures, and other equipment containing electrical or instrumentation and control devices, including spare parts, from corrosion through the use of corrosion-inhibiting vapor capsules. Prior to shipment, include capsules in the shipping containers, and equipment as recommended by the capsule manufacturer. During the construction period, periodically replace the capsules in accordance with the capsule manufacturer's recommendations. Replace all capsules just prior to Final Acceptance.

D. ESD Protection. Provide for the proper handling, storage, and environmental conditions required for the CS components deemed static sensitive by the equipment manufacturer. Utilize anti-stat wrist straps and matting during installation of these items to prevent component degradation.

E. Adequately pack manufactured material to prevent damage during shipping, handling, storage, and erection. Pack all material shipped to the project site in a container properly marked for identification. Use blocks and padding to prevent movement.

F. Ship materials that must be handled with the aid of mechanical tools in wood-framed crates.

G. Ship all materials to the project site with at least one layer of plastic wrapping or other approved means to make it weatherproof. Anti-stat protection shall be provided for all sensitive equipment.

H. Inspect the material prior to removing it from the carrier. Do not unwrap equipment until it is ready for installation. If any damage is observed, immediately notify the carrier so that a claim can be made. If no such notice is given, the material shall be assumed to be in undamaged condition, and any subsequent damage that is discovered shall be repaired and replaced at no additional expense to the OWNER.

I. The Contractor shall be responsible for any damage charges resulting from the handling of the materials.

3.03 INSTALLATION

A. Install the CS in locations indicated on the Drawings and follow manufacturers' installation instructions explicitly, unless otherwise indicated. Wherever any conflict arises between manufacturers' instruction, and these Contract Documents, follow ENGINEER's decision, at no additional cost. Keep a copy of manufacturers' instructions on the jobsite available for review at all times.
B. Install materials and equipment in a workmanlike manner utilizing craftsmen skilled in the particular trade. Provide work, which has a neat and finished appearance. Coordinate I&C work with the OWNER and work of other trades to avoid conflicts, errors, delays, and unnecessary interference with operation of the existing plant during construction.

C. Where existing materials and equipment are removed or relocated, remove and deliver to the OWNER all materials no longer used, unless otherwise directed by the ENGINEER. Repair affected surfaces to conform to the type, quality, and finish of the surrounding surface in a neat and workmanlike manner. Follow any specific instructions given by the ENGINEER.

D. Provide materials and equipment with manufacturer's standard finish system. Provide manufacturer's standard finish color, except where specific color is indicated. If manufacturer has no standard color, finish equipment with light gray color.

E. Keep the premises free from accumulation of waste material or rubbish. Upon completion of work, remove materials, scraps, and debris from premises and from interior and exterior of all devices and equipment. Touch-up scratches, scrapes, or chips in interior and exterior surfaces of devices and equipment with finishes matching as nearly as possible the type, color, consistency, and type of surface of the original finish. Clean and polish the exterior of all panels and enclosures upon the completion of the demonstration tests.

F. Ground each analog signal shield on one end at the receiver end only. Properly ground all surge and transient protection devices. Coordinate grounding system with Division 16 - ELECTRICAL.

G. Surge Protection. Provide appropriately sized electrical transient protection devices for all electrical elements of the system to protect the CS equipment and equipment which interfaces with the CS from transient surges in power and signal wiring (from lightning and other ground potential differences). Locate and properly ground surge suppressors at: any connection between power sources and electrical equipment including panels, assemblies, and field devices; and at both ends of all analog signal circuits.

3.04 TRAINING

A. The cost of training programs to be conducted with OWNER's personnel shall be included in the Contract price. The training and instruction, insofar as practicable, shall be directly related to the System being supplied.

B. The SYSTEM INTEGRATOR shall provide detailed manuals to supplement the training courses. The manuals shall include specific details of equipment supplied and operations specific to the project.

C. The SYSTEM INTEGRATOR shall make use of teaching aids, manuals, slide/video presentations, etc. After the training services, such materials shall be delivered to OWNER.

D. The training program shall represent a comprehensive program covering all aspects of the operation and maintenance of the system.
E. All training schedules shall be coordinated with, and at the convenience of the OWNER. Shift training may be required to correspond to the OWNER’s working schedule.

F. Specific details of the nature and duration of training to be provided are defined in the individual specification sections.

3.05 TESTING – GENERAL

A. All elements of the CS, both hardware and software, shall be tested to demonstrate that the total system satisfies all of the requirements of the Contract Documents.

B. As a minimum, the testing shall include shop tests, operational check-out tests, and Demonstration Tests.

C. Each test shall be in the cause and effect format. The person conducting the test shall initiate an input (cause) and, upon the system producing the correct result (effect), the specific test requirements will have been satisfied.

D. All tests shall be conducted in accordance with, and documented on, prior approved procedures, forms, and checklists. Each specific test to be performed shall be described and a space provided after it for signoff by the appropriate party after its satisfactory completion. Copies of these signoff test procedures, forms, and checklists will constitute the required test documentation.

E. Provide all special testing materials and equipment. Wherever possible, perform tests using actual process variables, equipment, and data. Where it is not practical to test with real process variables, equipment, and data, provide suitable means of simulation. Define these simulation techniques in the test procedures.

F. The SYSTEM INTEGRATOR shall coordinate all of their testing with the CONTRACTOR, the ENGINEER, all affected suppliers, and the OWNER.

G. The ENGINEER reserves the right to test or retest any and all specified functions whether or not explicitly stated in the approved test procedures. The ENGINEER’s decision shall be final regarding the acceptability and completeness of all testing.

END OF SECTION
SECTION 13310
FIELD INSTRUMENTS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This Specification Section covers work related to the various field instruments to be supplied. This specification is not a list of the components, but if the component is required as specified on the drawings, its specification will be part of this section.

B. The CONTRACTOR shall furnish all labor, materials, equipment, services and incidentals required to install and place into operation all field instrumentation shown on the Contract Drawings and as specified herein.

C. Equipment found to be defective prior to system acceptance shall be replaced and installed at no additional cost to the OWNER.

D. In the bid price, the CONTRACTOR shall provide, as necessary, for obtaining the services of authorized field personnel from the instrument manufacturer’s to supervise installation, start-up and checkout activities.

1.02 RELATED WORK

A. Specification Section 13320 – CONTROL SYSTEM defines work associated with the control system that interfaces with the field instrumentation.

1.03 EQUIPMENT FURNISHED

A. All equipment furnished by the SYSTEM INTEGRATOR shall be of the latest and most recent design, and shall have overall accuracy as guaranteed by the manufacturer.

B. To facilitate the OWNER’s operation and maintenance, products shall be of the same major instrumentation MANUFACTURER, and as far as possible, using the same manufacturer’s type and model of panel-mounted devices.

1.04 SUBMITTALS

A. Furnish, as prescribed under Section 13300 – CONTROL SYSTEM GENERAL REQUIREMENTS, all required submittals covering the items included under this section, and its related sections.

B. Submit complete, neat, orderly, and indexed submittal packages. Handwritten diagrams are not acceptable, and all documentation submittals shall be made using CADD generated utilities.

C. Provide all shop-drawing submittals on disk in PDF format.

D. Partial submittals, or submittals that do not contain sufficient information for complete review or are unclear, will not be reviewed and will be returned by the ENGINEER as Not Approved.

E. Submit the following Field Instrumentation Shop Drawings as a single package:
1. Catalog information, descriptive literature, wiring diagrams, and shop drawings on all components of the field instruments, including all miscellaneous electrical and mechanical devices furnished under this section.

2. Complete part numbers for all instruments, including any options, shall be identified. Provide manufacturer's data that correlates to the complete part number.

3. Individual data sheets for all components of the field instruments that supplement the above information, citing all specific features for each specific component (i.e., scale range, materials of construction, special options included, etc.). Each component data sheet shall bear the component name and instrument tag number designation indicated in the Drawings and Specifications.

4. Installation details for all field mounted devices shall show conformance with the Contract Documents.

5. Configuration documentation for all programmable devices shall indicate actual settings used to set the device scale, range, trip points, and other control parameters.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Hazardous Areas. If equipment is to be installed in a hazardous area, it shall meet the Class, Group, and Division classification as shown on the Contract Electrical Drawings, or comply with the local or National Electrical Code, whichever is more stringent.

B. All instruments requiring plumbing shall use stainless steel components as follows:

1. Test Tap: Shall consist of Crawford Fitting Co. Swagelock quick connects Series QC4-DE, or equal.

2. Tubing, Stainless Steel: Shall be ASTM A 312, TP 316, seamless, soft annealed with 0.065 inch wall. Fittings shall be ASTM A 276, TP 316 compression or socket weld type.

3. Valve, Ball: Shall be stainless steel ball valves, Whitey Series 40, Hoke Flamite Series 7100, or equal.

C. Mounting Hardware. All instruments shall be provided with mounting hardware, and floor stands or wall brackets or instrument racks.

D. Transmitters. All transmitters shall be provided with either integral indicators or conduit mounted indicators in process units, accurate to two percent. Indicator readouts shall be linear with process units.

2.02 FIELD INSTRUMENTS

A. Electro-magnetic Flow Metering System. The magnetic flow metering system shall comprise a flow through spool piece with sensing electrodes (Flow Element, FE-104) and an electronics unit (Flow Indicating Transmitter, FIT-104). The spool piece shall contain a coil energized by DC pulses from the electronics unit. The
voltage induced in the process fluid shall be sensed by the electrodes and converted by the electronics unit into a derived flow signal.

1. System Performance
   a. Systems shall be wet calibrated at the factory using NIST traceable equipment.
   b. Overall system accuracy shall be +/- 0.5 percent of the flow rate between 1 and 30 feet per second.
   c. It shall be possible to verify system calibration in the field. Methods which require removal of the spool piece or a second flow measurement (i.e. another meter or known volume) will not be acceptable.

2. Materials
   a. Tube: Carbon Steel
   b. Liner: Neoprene rubber for clean water applications. All other applications shall be Teflon.
   c. Flange: 316 Stainless Steel ANSI 150#
   d. Electrodes: 316 Stainless Steel.

3. Ratings
   a. Vault located spool piece: Rated for continual submergence to 10 feet. This shall include potting of the cable between the spool piece and electronics unit.
   b. Other spool pieces: NEMA 4X
   c. Electronics Unit: NEMA 4X

4. Power
   a. Power Requirement: 120 VAC, 60 Hz, +/- min. 10 percent

5. Functions
   a. Programmable low flow cut-out
   b. Empty pipe detection
   c. Electronic unit display: minimum of 2 rows x 16 characters, backlit LCD

6. Options
   a. Remote Mount Transmitter
   b. Provide grounding rings as required to establish potential matching
   c. Provide ultrasonic cleaning where necessary for coating sensitive systems
   d. Provide special tools and software necessary to effect field calibration
e. Provide certificate of factory calibration

7. Manufacturer and Model
   a. ABB Instrumentation, Magmaster, no equals

B. Pressure Transmitter. The system shall consist of a pressure sensor and transmitter with indication (Pressure Indicating Transmitter, PIT-XXX) with interconnecting cable, and an electronics unit that produces an analog signal.

1. System Performance
   a. The electronics unit shall contain preset algorithms containing the necessary factors to convert a pressure reading to a 4-20 mA signal
   b. The system shall be field calibratable, without the use of external calibrators

2. Sensor Materials
   a. Wet locations: Stainless steel.

3. Ratings
   a. Electronics Unit Enclosure or Housing: NEMA 4X
   b. IP 68
   c. Explosion proof

4. Power
   a. Power Requirement: 10.5-30 VDC
   b. Integral surge protection

5. Functions
   a. Upper Range Limit (URL) shall be 0.04% adjustable at the transmitter
   b. Span limits shall be 1.6 to 100 psi
   c. Base accuracy shall be +/- 0.075%
   d. Turndown (TD) ratio shall be 15:1
   e. Stability shall be 0.10% of URL over a six month period
   f. Electronic unit display: LCD 15 row x 56 column dot matrix lines indication.
   g. Output signal as percentage, current or engineering units
   h. Remote indicator (Cometer and Prometer LCD)

6. Training
   a. Provide four hours of on-site instruction for up to three of the OWNER's personnel, covering the operation, calibration, and maintenance of the instrument. Training shall be conducted at a time convenient to OWNER.
7. Manufacturer, Model series
   a. ABB 2600T Series, or ENGINEER approved equal

2.03 SPARES AND TEST EQUIPMENT
   A. Obtain from the manufacturer(s) and furnish any special tools, calibration equipment, and testing apparatus required for the proper adjustment and maintenance of the instruments provided.

PART 3 - EXECUTION

3.01 PRODUCT HANDLING
   A. Ship all materials to the project site with at least one layer of plastic wrapping or other approved means to make it weatherproof. Anti-static protection shall be provided for all sensitive equipment.
   B. Inspect all material prior to removing it from the carrier. Do not unwrap equipment until it is ready to be installed. If any damage is observed, immediately notify the carrier so that a claim can be made. If no such notice is given, the material shall be assumed to be in an undamaged condition, and any subsequent damage that is discovered shall be repaired and replaced at no additional expense to the OWNER.
   C. The Contractor shall be responsible for any damage charges resulting from the handling of the materials.
   D. Store and protect equipment until installation, following the storage and handling instructions recommended by the equipment manufacturers.
   E. Protection During Construction: Throughout this Contract, provide protection for materials and equipment against loss or damage and from the effects of weather. Prior to installation, store items in indoor, dry locations.

3.02 INSTALLATION
   A. Install the field instruments in strict accordance with the respective manufacturer’s instructions and recommendations, in the locations shown in the Drawings, and as indicated on the installation details of the Drawings.
   B. Install materials and equipment in a workmanlike manner utilizing craftsmen skilled in the particular trade. Work shall have a neat and finished appearance. Coordinate I&C work with the OWNER and the work of other trades to avoid conflicts, errors, delays, and unnecessary interference with operation of the existing plant during construction.
   C. Provide finish on instruments and accessories that protects against corrosion in the environment in which they are to be installed.
   D. For the purposes of uniformity and conformance to industry standard, provide analog signal transmission modes of electronic 4-20 mA DC. No other signal characteristics are acceptable.
   E. Discrete signal are two-state logic signals. Use 120 VAC sources on all discrete signals unless otherwise noted or shown.
   F. Fully calibrate each instrument.
3.03 INSTRUMENT LOOP CHECKOUT TESTS

A. Check all new field instrumentation for proper installation, calibration and adjustment on a loop-by-loop and component-by-component basis to verify that it is in conformance with the related submittals and the Specifications.

B. The Loop/Component Inspections and Tests: shall be implemented using approved forms and checklists. These shall be developed by the SYSTEM INTEGRATOR and submitted for approval.

C. Loop Status Report: Each control loop shall have a Loop Status Report to organize and track its inspection, adjustment, and calibration. These reports shall include the following information and check-off items with spaces for sign-off by the SYSTEM INTEGRATOR:

1. Project Name
2. Control Loop Number or description
3. Tag Number or description for each component of the control loop
4. Check-offs/sign-offs for each component for proper installation, termination, and calibration/adjustment
5. Check-offs/sign-offs for the control loop for proper panel interface terminations, I/O interface terminations, I/O signal operation relative to the computer network, and total loop operation ready
6. Space for comments

D. Component Calibration Sheet: Each field instrument element shall have a Component Calibration Sheet. These sheets shall have the following information, spaces for data entry, and a space for signoff by the SYSTEM INTEGRATOR:

1. Project Name
2. Component Tag Number
3. Manufacturer, Model Number/Serial Number of field element
4. Summary of Functional Requirements (scale, range, computing equation, control action, etc.)
5. Calibrations of span, setpoints, and preset adjustable parameters
6. Space for comments

E. Maintain the Loop Status Reports and Component Calibration Sheets at the jobsite and make them available to the ENGINEER at any time.

F. Witnessing: The inspections and tests in Section 3.03 do not require witnessing. However, the ENGINEER will review the Loop Status Sheets and Component Calibration Sheets and spot-check their entries periodically and upon completion of the Operational Check-out Tests. Correct any deficiencies found.

END OF SECTION
SECTION 13315
CONTROL PANELS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This Specification Section defines general requirements applicable to all control panels and enclosures furnished under the Contract. Additional requirements are defined in other Specification Sections as defined in paragraph 1.02.

B. The control panels shall be furnished by the same SYSTEM INTEGRATOR furnishing services and equipment as outlined in Section 13300 – CONTROL SYSTEM GENERAL REQUIREMENTS.

C. The SYSTEM INTEGRATOR shall furnish all labor, materials, equipment, services, and incidental required to install and place into operation all control panels shown on the Contract Drawings and as specified herein.

D. Size free-standing control panel(s) as necessary to contain all equipment associated with the Work, including future equipment, and to adequately dissipate heat generated by equipment mounted in or on the panel. It shall not be necessary to provide additional panels to accommodate future system expansion.

E. Smaller surface-mount panels shall be sized to adequately dissipate heat generated by equipment, with ventilation components mounted inside or on the panel front face.

F. The SYSTEM INTEGRATOR shall design, furnish and install all interior wiring within the control panels and furnish complete wiring diagrams showing the electrical circuits inside the panel and interconnections between the panel and external instruments and components.

1.02 RELATED WORK

A. Control Panels are further defined, and furnished under, the following Specification Sections:

1. Specification Section 16050 – ELECTRICAL defines additional requirements.

2. ALL field instruments are to be mounted on the control panels as shown in the Contract Drawings.

1.03 SUBMITTALS

A. Submit the following control panel shop drawings in a single package:

1. Layout Diagrams. Include panel elevations (front, side, interior), and sizing. Panel front elevations shall be of sufficient scale to allow all engraved nameplates and inscriptions to be legible without the use of schedules.

2. Wiring Diagrams. Diagrams shall be complete electrical wiring diagrams showing all components and auxiliary devices such as relays, alarms, fuses, lights, fans, heaters, etc. All wires and terminals shall be numbered on the diagrams, and line cross-references shall be labeled. Include on these
drawings a tag number to identify each component, referenced to a component identification list.

3. Power requirements and heat dissipation summary for all control panels. Power requirements shall state required voltages, currents, and phase(s). Heat dissipations shall be maximums and shall be given in Btu/hr. Summary shall be supplemented with calculations.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Equipment to be installed in a hazardous area shall meet Class, Group, and Division classification as shown on the Contract Electrical Drawings, or comply with the local or National Electrical Code, whichever is the most stringent requirement.

B. Electronic equipment shall utilize printed circuitry, suitably coated to prevent contamination by dust, moisture, and fungus. Solid-state components shall be conservatively rated for their purpose, to assure optimum long-term performance and dependability over ambient atmosphere fluctuations and 0 to 100 percent relative humidity. The field mounted equipment and system components shall be designed for installation in dusty, humid, and slightly corrosive service conditions.

C. All equipment shall be designed to operate on a 60 Hz alternating current power source, at a normal 120 volts, +/− 10 percent, except where noted. All regulators and power supplies required for compliance with the above shall be provided between the power supply and the interconnected instrument loop. Where equipment requires voltage regulation, constant voltage transformers shall be supplied.

D. All equipment, cabinets and devices furnished hereunder shall be heavy-duty type, designed for continuous industrial service. The system shall contain products of a single MANUFACTURER, insofar as possible, and shall consist of equipment models which are currently in production.

E. All switches shall have double-pole, double-throw contacts, rated at a minimum of 600 volts-amperes (VA), unless noted otherwise.

F. All equipment shall be designed and constructed so that in the event of a power interruption, the equipment shall resume normal operation without manual resetting when power is restored.

2.02 LIGHTNING/SURGE PROTECTION

A. Surge suppressors and arrestors meeting the requirements of ANSI Standard C-62.41 (latest revision) shall be provided on all wiring entering all panels and enclosures.

B. DC signals. Lightning and surge protection shall be provided on all 4-20 mA signal wires. The protectors shall meet the following criteria:

1. 35 mm DIN rail mounted
2. Response time: less than five nanoseconds
3. Automatic reset
4. Operating signal voltage: up to 30 VDC
5. Operating signal current: up to 150 mA
6. Capable of withstanding 1,200 Amps at IEEE/ANSI C-62.41 8 x 20 microseconds combination wave
7. Capable of withstanding 100 Amps at IEEE/ANSI C-62.41 10 x 1 milliseconds long wave
8. Nominal series resistance of 5 ohms each leg
9. Manufacturer and Model:
   a. EDCO DRS-036, or ENGINEER approved equal.

C. Discrete Signals
   1. All discrete outputs regardless of their destination shall be equipped with interposing relays each fitted with a snubber circuit across the coil.

D. Single phase AC Power (to 15 Amps). Lightning and surge protectors for AC power supply lines up to 15 Amps service shall meet the following criteria:
   1. Serial protection with replaceable fuse
   2. Failure indicator
   3. Response time of less than five nanoseconds
   4. Capable of withstanding up to 10,000 Amps at IEEE/ANSI C-62.41 8 x 20 microseconds combination wave
   5. Manufacturer and Model:
      a. EDCO HSP121BT, or approved equal

E. Single phase AC Power (over 15Amps). Lightning and surge protectors for AC power supply lines over 15 Amps service shall meet the following criteria:
   1. Parallel protection using MOVs and thermal fusing technology
   2. Failure indicator
   3. Response time of less than five nanoseconds
   4. Capable of withstanding up to 6,500 Amps at IEEE/ANSI C-62.41 8 x 20 microseconds combination wave
   5. Manufacturer and Model
      a. EDCO FAS-120AC, or approved equal

2.03 CONTROL PANELS AND ENCLOSURES

A. Finish
   1. All front panel openings for panel-mounted equipment shall be cut with counter-boring and provided with trim strips as required to give a neat finished appearance.
   2. With the exception of stainless steel panels, all steel panel surfaces shall be treated with phosphatized treatment inside and out, and then finished on the exterior with two coats of baked enamel of the approved color. Interiors of panels shall be white, ANSI No. 51.
   3. Stainless steel panels shall be No. 7 polished, 316 stainless steel.

B. Doors
   1. All control panels shall have a continuous piano hinge door. A minimum of 80% of the panel interior shall be exposed by doors.
2. Panel door openings shall be NEMA 4X rated and shall be sealed and fully gasketed.
3. The inside of each door shall be equipped with a drawing pocket.
4. Two-door enclosures shall have a removable center post.
5. Sealed panel doors shall be equipped with quick-release latches.
6. Panel doors shall be equipped with a three-point latching mechanism.
7. Where noted, doors shall be equipped with a fully gasketed glass window for viewing internally mounted devices without opening the door.

C. All components and terminals shall be accessible without removing other components, except for covers.

D. Surface mounted panels shall have conduit entry from the bottom only. Freestanding, NEMA 6, panels shall have an open area in the bottom for conduit entry.

E. All panels shall be provided with an isolated copper grounding bus to ground all signal and shield connections.

F. Free standing control panels shall each be equipped with an internal 40-watt fluorescent light and 120 VAC, 15 amp, duplex utility receptacle.

G. Nameplates
   1. All front-face panel mounted controls shall be equipped with screw mounted laminated plastic nameplates to completely define their use. The use of adhesive to mount front panel nameplates will not be acceptable.
   2. All internal components shall be equipped with identification tags, using PID identifiers where applicable.

H. Electrical
   1. Provide a main circuit breaker and branch circuit breaker(s) for each branch circuit as required to distribute power from the main power feed.
   2. All breakers shall accessible when the panel door is open.
   3. No more than 20 devices on any single circuit.
   4. No more than 12 amps for any branch circuit.
   5. Panel (or site) lighting, receptacles, heaters, controls, telemetry and fans on separate branch circuits.

I. Wiring
   1. Power wiring shall be 300 volt, type THWN stranded copper, No. 14 AWG size, for 120 VAC service.
   2. Discrete wiring shall be 300 volt type THWN stranded copper, sized for the current carried, no smaller than No. 16 AWG.
   3. Analog signal wiring shall be 300 volt, stranded copper in twisted shield pairs, no smaller than No. 16 AWG.
   4. Panel wiring shall be routed through wire troughs or Panduits.
5. Hinge wiring shall be secured at each end, with the bend portion protected by a plastic sleeve.
6. Analog or DC wiring shall be separated from any AC power or control wiring by at least six inches.
7. Each wire shall be uniquely identified using plastic, snap-on numbered tags.
8. Terminal blocks shall be provided for all field wiring entering the panel. The greater of 4 or 15% spare terminal blocks shall be provided.
9. No more than one wire per screw and yoke termination.

J. Construction
1. Panel shall be NEMA 4X.
3. Stiffeners as required to prevent deflection under instrument loading and permit lifting without racking or distortion.
4. Use removable lifting rings where required, and fill plugs to replace rings after installation.

K. Miscellaneous Equipment
1. All panels shall be protected from internal corrosion by the use of corrosion-inhibiting vapor capsules by Northern Instruments (Model Zerust VC), Hoffman (Model A-HCI), or ENGINEER approved equal.
2. All sealed panels shall be equipped with combination drain/breathers, Crouse-Hinds Model ECD18; or ENGINEER approved equal.

L. All panels shall be manufactured items by Hoffman Engineering, Saginaw Control and Engineering, or ENGINEER approved equal.

2.04 PANEL MOUNTED DEVICES

A. Selector Switch
1. Heavy-duty, oil-tight, industrial type selector switches rated for NEMA 4X service.
2. Contacts rated for 120 VAC service at 10 amperes, continuous.
3. Number of positions and contact arrangements as required.
4. Factory-engraved legend plate indicating position definition.
5. Accommodating a panel thickness between 1/16 to 1/4 Inch.
7. Square D Class 9001, Type K; Allen-Bradley type 800T, or ENGINEER approved equal.

B. Pushbutton
1. Heavy-duty, oil-tight, industrial type push buttons rated for NEMA 4X service.
2. Contacts rated for 120 VAC service at 10 amperes continuous.
3. Number of positions and contact arrangements as required.
4. Factory-engraved legend plate indicating function.
5. Accommodating a panel thickness between 1/16 to 1/4 inch.
6. Operator: Red extended head for STOP, green flush head for START, black flush head for other functions.
7. Square D Class 9001, Type K; Allen-Bradley type 800T, or ENGINEER approved equal.

C. Process Indicator
1. Signal loop powered.
2. 3 ½ digit with selectable decimal point.
3. 0.4 inch digit LCD
4. Factory supplied nameplate legend in process units
5. Separate span and zero adjustment
6. NEMA 4X enclosure
7. Dynalco LMD-120D, or ENGINEER approved equal.

D. Indicating Light
1. Heavy-duty, oil-tight, push-to-test industrial type with integral transformer for 120 VAC application.
2. Rated for NEMA 4X service.
3. Screwed-on flat-faced lenses in colors shown on the drawings.
5. Square D Type K, Allen-Bradley Type 800T, or ENGINEER approved equal.

E. Control/Interposing Relays
1. Compact, general-purpose, plug-in type.
2. Socket mounted.
3. Contacts rated for not less than 10 amperes at 120 VAC.
4. Equipped with neon status lights and test buttons.
5. Permanent, legible identification.
6. Potter & Brumfield series KRPA, or ENGINEER approved equal.

F. Time Delay Relay
1. Available functions: On delay, Off delay, or one shot.
2. Socket mounted.
4. Contacts rated for not less than 10 amperes at 12 VAC.
5. Timing range as appropriate for the application.
6. Magnecraft Series W211, or ENGINEER approved equal.

G. Terminal Blocks
1. Screw terminals capable of accepting 10-26 AWG wire.
2. Fused disconnect style.
3. DIN-rail mounting.
4. Connectors shall be either copper or steel. Use of aluminum connectors shall not be permitted without prior approval of the Engineer.
5. Phoenix Contact UT4 HES1, or ENGINEER approved equal.

H. Process Indicator/Retransmitter
1. 120 VAC/60 Hz powered.
2. 4 digit with selectable decimal point.
3. 0.6 inch digit LED with three colors, and programmable, based on process value
4. Separate span and offset adjustment to scale input.
5. Isolated 4-20 mA re-transmission output
6. Dual programmable SPDT contact outputs rated for 3A at 250 VAC
7. RS-232, RS-485 Serial Communications Options
8. NEMA 4X, IP65 Front
9. Precision Digital PD765, or ENGINEER approved equal

2.05 SPARES AND EXPENDABLES
   A. Provide the following spare parts
      1. Five percent (rounded up) spare relays of each type provided.
      2. Five percent (rounded up) spare surge suppressors of each type provided
      3. Five percent (rounded up) spare panel mounted device of each type used
   B. Provide the following expendables
      1. Two year supply of corrosion inhibitor capsules
      2. Ten percent (rounded up) spare fuses of each type and rating supplied
      3. Ten percent (rounded up) spare indicator light bulbs of each type and color supplied

PART 3 - EXECUTION

3.01 INSTALLATION
   A. Control panels shall be provided to the electrical subcontractor for installation and connection of field and power wiring.
   B. All free-standing control panels shall be installed on a minimum of 3 inches high concrete housekeeping pad.
   C. Verify the correct installation of all panels supplied under this Specification Section.

END OF SECTION
SECTION 13320

CONTROL SYSTEM

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This Specification Section covers work related to the replacement/upgrade of the existing plant control system.

B. The Work, as specified herein, shall be performed by the same SYSTEM INTEGRATOR furnishing services and equipment as outlined in Specification Section 13300.

C. The Work generally comprises the following major elements:
   1. The installation, furnishing and programming of (1) PLC to be used in the controlling of Lift Station 9.
   2. Leave space on panel rack for future radio and auxiliary equipment.

1.02 RELATED WORK

A. Specification Section 13300 defines general requirements that apply to the Work of this Section.

B. Specification Section 13315 defines requirements applicable to the backup control panel and PLC back panel appurtenances (e.g. surge suppression, isolation relays, etc.).

1.03 SYSTEM DESCRIPTION

A. The new PLC system shall be based on Allen Bradley 1766 Micrologix 1400 series. The PLC shall be used in conjunction with external signals for automatic control of the Lift station. The PLC shall be able to interface with a futures radio system here in for external monitoring and control of the station.

1.04 SUBMITTALS

A. Provide a control system equipment shop drawing package that includes the following:
   1. Block Diagram: A detailed system block diagram showing all major components. Identify components by model number. Show interconnecting cables diagrammatically (by type and size).
   2. Bill of Materials: A list of all components, including all third party software. Group components by type and include component model number and part number, component description, quantity supplied, and reference to component catalog information.
   3. Descriptive Information: Catalog information, descriptive literature, performance specifications, internal wiring diagrams, power and grounding requirements, power consumption, and heat dissipation of all elements. Clearly mark all options and features proposed for this project.
4. Installation Details. Equipment installation drawings showing external dimensions, enclosure material and spacing, mounting connections, and installation requirements.

B. Maintenance Agreement. Prior to the start of the System Acceptance Test, provide a proposed maintenance agreement. The requirements for this agreement are further defined in Part 2- Products of this section.

1.05 FINAL DOCUMENTATION

A. In addition to the final documentation required by Specification Section 13300, provide the following control system documentation:
   1. Licenses in the OWNER’s name for all software supplied.
   2. Final copies of all PLC programs on Compact Disk.
   3. Complete hard copy printout of each PLC program logic.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. All control system equipment shall be of modular construction and shall be capable of field expansion through the installation of plug-in circuit cards or additional cabinets.

B. The equipment furnished shall be designed to operate satisfactorily between 0 degrees C and 40 degrees C at up to 95 percent Relative Humidity (non-condensing).

C. All equipment furnished shall be designed and constructed so that in the event of power interruption, or temperatures outside the operational range, the system specified shall go through an orderly shutdown with no loss of memory, and resume normal operation without manual resetting when power is restored.

2.02 PROGRAMMABLE LOGIC CONTROLLER SYSTEM

A. The new PLC shall be implemented using Allen Bradley MicroLogix series components mounted in the Lift Station 9 control panel. All part numbers defined in this subsection are Allen-Bradley part numbers, except where otherwise noted.

B. PLC shall contain the following modules in 1766 series chassis:
   1. Controller module: P/N 1766-L32BXBA.
   2. The actual unit supplied shall be sufficient to provide 33% unused memory capacity when the entire PLC program, as provided, is loaded and running.
   3. To include RS-232/RS-485 interface cable: P/N 1761-CBL-AP00.
   4. (1) MicroLogix 1400 memory Module (MM1)

C. Input/Output Modules. The required quantities of discrete and analog system inputs and outputs are defined in Part 3 hereof. Provide the appropriate quantities of the following I/O modules:
   1. Discrete Inputs. Provide 32-point 24-Volt D.C. input module, P/N 1762-IQ16
   2. Analog Inputs. Provide 2-point non-isolated, 2-point differential 4-20 mA input module, P/N 1762-IF4-AI.
D. Operator Interface Terminals
   1. Hardware shall be Allen-Bradley PanelView Plus, 10”.

E. Uninterruptible Power Supply. The PLC shall be furnished with an Uninterruptible Power Supply that meets the following requirements:
   1. Battery sized to support all PLC equipment and related appurtenances for a minimum of 15 minutes duration.
   2. Operating Range: 0-50 degrees C.
   3. Automatic weekly self test.
   4. Relay contact outputs for “ON BATTERY” and “LOW BATTERY” alarms.
   5. High temperature (to 50 degrees C) battery option: Allen Bradley P/N 1609-500HBAT or approved equal.
   6. Allen Bradley P/N 1609 or approved equal.

F. Programming Software
   1. PLC programming software shall be Rockwell Automation RSLogix. No equal.
   2. HMI Software shall be Rockwell FactoryTalk. No equal.
   3. Alarm Monitoring Software shall be Specter Instruments Win911. No equal.
   4. Historian Software shall be Rockwell FactoryTalk Historian SE. No equal.

2.03 SPARES
A. Provide the following spares:
   1. Two power supply modules.
   2. Two CPU modules.
   3. Two of each type of I/O module.
   4. One of each other type of PLC chassis module

2.04 RADIO SYSTEM/REMOTE TELEMETRY UNIT (R.T.U.)
A. The station shall be configured to work with a future radio modem system cable of transmitting discrete and analog signals back to the Wastewater plants main control room and allow for external control of the station. The future radio equipment shall be:
   1. Radio modem shall be TS4000C05B45SNWR manufactured by Teledesign
   3. Data Connector: 9 pin D female
   4. Supply Voltage: 9-28 VDC
   5. Power: 1.5 Watts
   6. LED Indicators: Transmit, Receive, Power
   7. Remote Diagnostics

B. The antenna equipment specifications shall be as follows:
   1. Mosaic Vibration resistant Collinear Antenna manufacturer PCTEL: P/N ASP76551
2. Mobile Low Profile Vertical Antenna manufacturer PCTEL: P/N MLPV450
3. PCTEL cable kit P/N K794
4. Lightning arrestor manufacturer Polyphaser: P/N IS-50NX-C1
5. (3) RF Industries Type N male connectors for RG58 P/N RFN-1005-3C

2.05 INSTALLATION
   A. SYSTEM INTEGRATOR shall work in conjunction with OWNER appointed SCADA programmer to ensure proper system integration.

2.06 MAINTENANCE AGREEMENT
   A. This section will be handled by the OWNER.

PART 3 - EXECUTION

3.01 SYSTEM INPUTS/OUTPUTS
   A. The Lift Station’s Input/Output (I/O) signals, also shown on the Contract Drawings.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Type</th>
<th>Tag</th>
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<tbody>
<tr>
<td>1</td>
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<td>2</td>
<td>12V Power</td>
<td>DI</td>
<td>JE-407</td>
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<td>3</td>
<td>Air Compressor Fail</td>
<td>DI</td>
<td>PSL-118</td>
</tr>
<tr>
<td>4</td>
<td>Pump 1 Overload</td>
<td>DI</td>
<td>TSH-112-1</td>
</tr>
<tr>
<td>5</td>
<td>Pump 2 Overload</td>
<td>DI</td>
<td>TSH-112-2</td>
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<tr>
<td>6</td>
<td>Pump 1 Running</td>
<td>DI</td>
<td>YI-114-1</td>
</tr>
<tr>
<td>7</td>
<td>Pump 2 Running</td>
<td>DI</td>
<td>YI-114-2</td>
</tr>
<tr>
<td>8</td>
<td>PMA, Phase Monitor</td>
<td>DI</td>
<td>PMA-403</td>
</tr>
<tr>
<td>9</td>
<td>High Water Level</td>
<td>DI</td>
<td>LSHH-120</td>
</tr>
<tr>
<td>10</td>
<td>Low Water Level</td>
<td>DI</td>
<td>LSSL-121</td>
</tr>
<tr>
<td>11</td>
<td>All Pumps Off Level</td>
<td>DI</td>
<td>LSL-107</td>
</tr>
<tr>
<td>12</td>
<td>Lead Pump ON</td>
<td>DI</td>
<td>LSH-108</td>
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<tr>
<td>13</td>
<td>Lag Pump ON</td>
<td>DI</td>
<td>LSH-115</td>
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<td>14</td>
<td>Intruder Alarm at Control Panel</td>
<td>DI</td>
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<td>15</td>
<td>Intruder at RTU Panel</td>
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<td>YE-401</td>
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<td>16</td>
<td>Intruder Acknowledge Control Panel</td>
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<td>17</td>
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<td>Call Pump 2</td>
<td>DO</td>
<td>Y-P2</td>
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<td>19</td>
<td>Remote Silence</td>
<td>DO</td>
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<td>Wet Well Level</td>
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<td>Run Time, Pump 1</td>
<td>AO</td>
<td>KIRQ-114-1</td>
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<td>22</td>
<td>Run Time, Pump 2</td>
<td>AO</td>
<td>KIRQ-114-2</td>
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<td>Pump 1 in Auto</td>
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<td>YI-P1</td>
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<td>DI</td>
<td>YI-P2</td>
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<td>DI</td>
<td>YE-110-1</td>
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<tr>
<td>26</td>
<td>Pump 2 Leak</td>
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<td>27</td>
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<tr>
<td>28</td>
<td>Pump 2 Thermal Overload</td>
<td>DI</td>
<td>TSH-112-2</td>
</tr>
</tbody>
</table>
B. In addition to the I/O listing above, the PLC shall be equipped with a minimum of 10% active spares of each signal type.

3.02 TRAINING

A. Operations: Provide a minimum of one day of training at the jobsite for up to six of the OWNER’s personnel in the modified operation of the system.

B. Hardware Maintenance: Provide a minimum of three days of hardware training for up to three of the OWNER’s personnel in the maintenance of the system hardware which shall include:

1. Training in standard hardware maintenance for the equipment provided.
2. Specific training for the actual hardware configuration to provide a detailed understanding of how the equipment and components are arranged, connected, and set up for the control system.
3. Test, adjustment, and calibration procedures.
4. Troubleshooting and diagnosis.
5. Component removal and replacement.
6. Periodic maintenance.

C. Software Maintenance: Provide a minimum of three days of software training for up to two of the OWNER’s personnel in the maintenance and use of the PLC software.

D. Training shall occur at the jobsite with the actual installed hardware and software after the system has been fully installed, debugged, and demonstrated. Manufacturer’s literature, operations, and maintenance manuals for the hardware and software shall be provided for use during this training and copies of these documents shall be included in the O&M materials.

3.03 SYSTEM ACCEPTANCE TEST (SAT)

A. After completion of installation and start-up and all OWNER training, the entire system shall operate for a period of 60 consecutive days, under conditions of full plant process operation, without a single non-field repairable malfunction.

B. Provide complete O&M Manuals for the control system at the jobsite at least two weeks prior to the SAT.

C. During this test, plant operating and SYSTEM INTEGRATOR personnel shall be present as required. The SYSTEM INTEGRATOR is expected to provide personnel for this test who have an intimate knowledge of the hardware and software of the system.

D. While this test is proceeding, the OWNER shall have full use of the system. Only plant operating personnel shall be allowed to operate equipment associated with live plant processes.

E. Any malfunction during the tests shall be analyzed with corrections made by the SYSTEM INTEGRATOR. The ENGINEER and/or OWNER will determine whether any such malfunctions are sufficiently serious to warrant a repeat of this test.

F. Any malfunction during this 60 consecutive day test period, which cannot be corrected within 24 hours of occurrence by the SYSTEM INTEGRATOR’s personnel,
or more than two similar failures of any duration, will be considered as a non-field-repairable malfunction and result in failure of the SAT. The SYSTEM INTEGRATOR shall implement necessary corrections to the system to prevent recurrence of the malfunction and the SAT shall be restarted.

G. All data base errors must be corrected prior to the start of each test period. The 60-day test will not be considered successful until all databases are correct.

H. The total availability of the system shall be greater than 99.5 percent during this test period. Availability is given by (Total Time - Down Time) / Total Time.

I. Down times due to power outages or other factors outside the normal protection devices or back-up power supplies provided, shall result in a temporary suspension of the test until repairs are completed. Upon repair, the test shall restart without the repair time contributing to the availability test times above.

J. Upon successful completion of the Site Acceptance Test and subsequent review and approval of complete system final documentation, the system shall be considered substantially complete and the guarantee period shall commence.

END OF SECTION
SECTION 15010
TESTING PIPING SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Perform pressure testing of water mains and sewage force mains using Contractor’s qualified personnel, or employ and pay for a qualified organization to perform specified services.

1.02 RELATED SECTIONS

A. Section 15062 – Ductile Iron Pipe and Fittings
B. Section 15064 – General Purpose PVC Pipe and Fittings
C. Other Sections as applicable.

1.01 REFERENCES

A. AWWA C600 – Installation of Ductile-Iron Mains and their Appurtenances
B. AWWA C605 – Underground Installation of PVC and Molecularly Oriented PVCO Pressure Pipe and Fittings

1.02 DESCRIPTION

A. Perform testing of piping systems in accordance with the latest edition of the AWWA REFERENCES and as specified above.

B. Provide instrument required for testing of piping systems.
   1. Make instruments available to Engineer to facilitate spot checks during testing.
   2. Retain possession of instruments; remove from site at completion of services.

C. Provide all water required for flushing and testing. The Contractor shall obtain a construction meter from the City at current rates and pay for meter rental and all water used.

D. Provide all necessary pumping equipment and other equipment, materials and facilities required for proper completion of the flushing and testing specified.

E. Source and quality of water, procedure and test equipment shall be acceptable to the Engineer. Length of tested line shall not exceed 2,000 feet.
F. All tests shall be made in the presence of the Engineer. Notify Engineer at least 48 hours before any Work is to be inspected or tested.

G. If inspection or test shows defects, the piping system(s) shall be repaired or replaced and inspection repeated, until such piping is acceptable to the Engineer.

H. All pipe, fittings, valves and joints shall be carefully examined during test. Leaky joints shall be tightened by remaking the joint.

I. Sections of the system may be tested separately. It shall be distinctly understood that any defect which may subsequently develop in section already tested and accepted shall promptly be corrected and that section retested.

J. Disposal of the water used for testing shall be subject to the approval of the Engineer.

1.03 QUALITY ASSURANCE

A. The organization which performs the testing shall, prior to testing, provide their qualifications and demonstrate their ability to perform the services to the satisfaction of the Engineer.

1.04 SUBMITTALS

A. Preliminary

1. Submit three copies of documentation to confirm compliance with Quality Assurance provisions:
   a. Organization supervisor and personnel training and qualifications.
   b. Specimen copy of each of the report forms proposed for use.

B. At least fifteen days prior to Contractor’s request for final inspection, submit three copies of final reports on applicable reporting forms, for review.

   1. Each individual final reporting form must bear the signature of the person who recorded data and that of the supervisor of the reporting organization.
   2. Identify instruments of all types which were used and last date of calibration of each.

1.05 JOB CONDITIONS

A. Prior to start of testing of piping systems, verify that required “Job Conditions” are met:

   1. System or system element installation is complete.
   2. All required materials, water, instruments, etc. are on hand.
   3. All other preparations are completed.

1.06 TESTING PROCEDURES

A. Gravity Sewer System:
1. Deflection Testing
   a. PVC pipe shall be tested for excessive deflection by means of a "Go, No-Go" mandrel or sewer ball. A 7 1/2% Deflection Mandrel shall be pulled through each manhole section to determine if excessive deflection has taken place. If the mandrel fails to be pulled through the sewer pipe, the Contractor shall attempt to pull the mandrel through from the other end of the manhole section. If the mandrel fails to be pulled through, again, the Contractor shall repair or replace that portion of the sewer main which has exceeded the 7 1/2% allowable pipe deflection.
   b. The Deflection Mandrel to be used for testing shall be submitted to the Engineer for approval prior to use. Each mandrel shall be constructed and utilized in accordance with the Uni-Bell Handbook of P.V.C. Pipe and the North American Pipe Corporation.
   c. Deflection Testing shall not take place until thirty days following the final backfilling over the pipe. This will allow time for settlement of all the backfill material. The Engineer's representative shall be present at all deflection tests.
   d. As an alternative to Deflection Mandrel testing, deflection testing may be performed by lamping if approved by the Owner and Engineer. Sewer lamping shall be witnessed by the Engineer and a representative from the City.

2. Exfiltration and Infiltration Testing
   a. Leakage tests by exfiltration and infiltration, as described below, will be made on all pipe. The Engineer shall have the option of determining which test(s) shall be employed. Generally, if the groundwater table is below the bottom of the pipe an exfiltration test shall be used. All other pipe shall be tested for infiltration.
   b. Exfiltration Test
      1) Exfiltration tests will be made on the pipe before or after backfilling at the discretion of the Engineer. The length of the sewer to be tested shall be such that the head over the crown of the upstream end is not less than 2 feet and the head over the downstream crown is not more than 6 feet unless directed otherwise by the Engineer. The sewer shall be plugged by pneumatic bags or mechanical plugs in such a manner that the air can be released from the sewer while it is being filled with water. The test shall be continued for one hour and provisions shall be made for measuring the amount of water required to maintain the water at a constant level during this period. If test results are unsatisfactory, the Engineer may direct that additional tests are made on any or all of the pipe.
2) If any joint shows an appreciable amount of leakage, the jointing material shall be removed and joint remade. If any pipe is defective, it shall be removed and replaced. No amount of leakage will be accepted. If the amount of leakage indicates defective joints or broken pipes, they shall be corrected by the Contractor.

c. Infiltration Test

1) Pipe shall be tested for infiltration after the backfill has been placed. Infiltration tests shall be made under the supervision of the Engineer, and the length of line to be tested shall be as directed by the Engineer. There shall be no allowable leakage.

2) Manhole exfiltration leakage shall not exceed 4 gallons per day per unit.

3) Sewer pipe exfiltration leakage shall not exceed 10 gallons per day per inch diameter per mile in a two-hour test period for any length of section tested.

4) Visible manhole or sewer pipe infiltration leakage shall not be acceptable.

5) Rates of infiltration shall be determined by means of a V-notch weir to be provided and installed by the Contractor in an approved manner, and at such times and locations as may be directed by the Engineer.

6) If an inspection of the completed sewer or any part thereof shows any manholes, pipes, or joints which allow the infiltration of water in a noticeable stream or jet, the defective work or material shall be replaced or repaired as directed.

7) All water used in testing and flushing shall be furnished at the Contractor's expense.

3. The sanitary sewer system shall be televised prior to final acceptance by the Engineer or the City. Video recording and reporting shall be reviewed. Contractor shall be responsible for correcting any deficiencies prior to acceptance by the City or submittal to any permitting agency. Testing and corrections shall be at the Contractor's expense.

B. Pressure Piping Systems

1. Water, sewer and drainage pressure piping shall pass a hydrostatic pressure test and a leakage test as defined below before acceptance. The pressure and leakage test shall be made after all jointing operations are completed and after backfilling is completed. All concrete reaction blocks, or other bracing and restraining facilities, shall be in place at least 14 days before the initial filling of the line.

2. The pressure and leakage tests may be applied to an individual section of line isolated between the existing line valves, or may be applied to shorter sections of line at the Contractor's option. If shorter sections are tested, test
plugs or bulkheads as required at the ends of the test section shall be furnished and installed by the Contractor at his expense, together with all anchors, braces, and other devices required to withstand the hydrostatic pressure on such plug or plugs, without imposing any hydraulic thrust on the pipe line or any part thereof. The Contractor shall be solely responsible for any and all damage to the pipe line, and/or to any other facility, which may result from the failure of test plugs furnished by him or supports therefore, in any case.

3. Hydrostatic Tests:
   a. The section of line to be tested shall be slowly filled with water and all air expelled from the pipe. Care shall be taken that all air valves are installed and open in the section being filled, and that the rate of filling does not exceed the venting capacity of the air valves.
   b. Hydrostatic test pressure shall be as follows:

<table>
<thead>
<tr>
<th>System</th>
<th>Test Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater Force Main</td>
<td>150 psi</td>
</tr>
<tr>
<td>Potable Water Main</td>
<td>150 psi</td>
</tr>
<tr>
<td>Other Pressure Pipe</td>
<td>1.5 times maximum operation pressure at the lowest elevation of the test section.</td>
</tr>
</tbody>
</table>

   c. After the pipe has been laid, all newly laid pipe of any valved section thereof shall be subjected to a hydrostatic pressure test.
      1) Test pressure shall:
         i. Not exceed pipe or thrust-restraint design pressures.
         ii. Be of at least 2-hour duration.
         iii. Not vary by more than ±5 psi (0.35 Bar) for the duration of the test.
         iv. Not exceed twice the rated pressure of the valves or hydrants when the pressure boundary of the test section includes closed gate valves or hydrants. NOTE: Valves shall not be operated in either direction at differential pressures exceeding the rated pressures.
         v. Not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed valves.

      2) Each valved section of pipe shall be filled with water slowly and the specified test pressure based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. The system shall be allowed to stabilize at the test pressure before conducting the leakage test.
d. Examination. Any exposed pipe, fittings, valves, hydrants and joints shall be examined carefully during the test. Any damaged or defective pipe fittings, valves or hydrants that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated until it is satisfactory to the Engineer.

1) Leakage Test
   i. A leakage test shall be conducted concurrently with the pressure test. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or valved section thereof, to maintain pressure within 5 psi (0.35 Bar) of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. Leakage SHALL NOT BE MEASURED BY A DROP IN PRESSURE IN A TEST SECTION OVER A PERIOD OF TIME.
   
   ii. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

\[
L = \frac{SD \times P^{\frac{1}{2}}}{148,000}
\]

In which \(L\) is the allowable leakage, in gallons per hour; \(S\) is the length of pipe tested in feet; \(D\) is the nominal diameter of the pipe in inches; and \(P\) is the average test pressure during the leakage test in pounds per square inch.

(a) To obtain leakage in liter/hour, multiply the values in the table by 3.785.

(b) When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/h/in (0.0012 L/h/mm) of nominal valve size shall be allowed.

(c) When hydrants are in the test section, the test shall be made against the closed hydrant.

(d) Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than that specified in Section “b” above, Contractor shall, at his own expense, locate and make repairs as necessary until the leakage is within the specified allowance.

(e) All visible leaks are to be repaired regardless of the amount of leakage.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. Prior to testing, pig and flush all piping systems with water to remove all debris in the system. Pigging of lines 12" and smaller is not required unless the line becomes contaminated.

B. No separate payment for testing shall be made.
SECTION 15062

DUCTILE IRON PIPE AND FITTINGS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Ductile Iron Pipe, Fittings and Appurtenances.
B. Cast Iron Pipe, Fittings and Appurtenances.

1.02 RELATED WORK

A. Section 02221 - Trenching, Bedding and Backfill for Pipe
B. Section 15100 - Valves

1.03 DESCRIPTION OF SYSTEMS

A. Piping and fittings shall be installed in those locations and depths as shown on the Drawings.
B. The equipment and materials specified herein are intended to be standard ductile iron pipe and fittings used in transporting water and wastewater.

1.04 QUALIFICATIONS

A. Iron pipe and fittings shall be furnished by manufacturers who are fully experienced, reputable, and qualified in the manufacture of the materials. The pipe and fittings shall be designed, constructed, and installed in accordance with the best practices and methods and shall comply with the Specifications in all respects.

1.05 REFERENCES

C. ANSI/AWWA C110/A21.10: American National Standard for ductile iron and gray iron fittings 3 inch through 48 inch for Water and Other Liquids.


I. ANSI/AWWA C606: American Water Works Association Standard for Grooved End Pipe and Fittings


K. ASME/ANSI B16.5: Pipe Flanges and Flanged Fittings, Class 150 (Flat Face Flange).

L. ASME/ANSI B16.42: Ductile Iron Pipe Flanges and Flanged Fittings, Class 150 (Flat Face Flange).

M. ASTM A307 Grade B: Low-Carbon Steel Bolts for Flanged Pipe.

1.06 SUBMITTALS

A. Submit a list of materials to be furnished, with the names of the suppliers and the date of delivery.

B. Submit sworn certificates of foundry material and strength tests, and their results. In addition, all ductile iron pipe and fittings may be inspected at the foundry for compliance with the Specifications by an independent testing laboratory selected by the Owners. The manufacturer's cooperation shall be required in these inspections. The cost of foundry inspections requested by the Owner will be borne by the Contractor.

C. Waiving of the inspection privileges shall not relieve the Contractor or manufacturer of the responsibility of furnishing pipe and fittings meeting the Specification.

D. Shop Drawings shall be submitted in accordance with Section 01340 and shall include dimensioning, methods and location of supports and all other pertinent technical specifications for all pipe and fittings to be furnished. Shop drawings shall be prepared by the pipe and fittings manufacturer.

E. Manufacturer shall furnish a laying schedule providing a location, type and size of all pipe joints.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. American Ductile Iron Pipe Company
B. United States Pipe and Foundry Company
C. McWane Cast Iron Pipe Company
D. Union Foundry Company
E. Clow Water Systems Company
F. Pacific States Cast Iron Pipe Company
G. Atlantic States Cost Iron Pipe Company
H. Griffin Pipe
I. Tyler Corporation
J. Or equal

2.02 COMPRESSION JOINT PIPE AND FITTINGS
A. Pipe shall conform to ANSI/AWWA C151/A21.51 and C150/A21.50.
B. Fittings shall conform to ANSI/AWWA C110/A21.10.
C. Rubber gaskets shall conform to ANSI/AWWA C111/A21.11.
D. Thickness shall be minimum pressure Class 350 through 12” and pressure Class 250 in sizes 14” and larger.
E. Install compression joint pipe below ground. Provide sufficient quantities of lubricant and gaskets.

2.03 MECHANICAL JOINT PIPE AND FITTINGS
A. Pipe shall conform to ANSI/AWWA A21.50/C151 and C150/A21.50.
B. Fittings shall conform to ANSI/AWWA C110/A21.10 in sizes 24” and larger and conform to ANSI/AWWA C153/A21.53 through 24”
C. Thickness shall be minimum pressure Class 350 up to 12”, Class 300 14” to 18” and pressure Class 250 in sizes 20” and larger.
D. Rubber gaskets shall conform to ANSI/AWWA C111/A21.11.
E. Bolts for mechanical joint pipe shall be tee-head design. Nuts and bolts shall be high-strength low alloy steel.
F. Restrained mechanical joints shall be installed where shown on drawings.
G. Mechanical joint pipe shall be installed below ground.
H. Furnish with sufficient supply of accessories, ie., gaskets, bolts, and glands, as required for each joint.

2.04 FLANGED JOINT PIPE AND FITTINGS

A. Pipe and fittings shall conform to ANSI/AWWA C115/A21.15.

B. Thickness shall be minimum pressure Class 350 through 12” and pressure Class 250 in sizes 14” and larger.

C. Flanges and flanged fittings shall be flat face conforming to ANSI/AWWA C110/A21.10. Full face 1/8 inch thick rubber ring gaskets shall conform to ANSI/AWWA C110/A21.10.

D. Flanges shall be ductile iron. Cast iron flanges will not be allowed.

E. Flanged ductile iron pipe shall have factory applied screwed long hub flanges. Flanges shall be faced and drilled after being screwed on the pipe, with flanges true to 90 degrees with the pipe axis and shall be flush with end of pipe conforming to ANSI B16.1 Class 125.

F. Bolts for flange pipe shall be low-carbon steel conforming to ASTM A307 Grade B, except where noted.

G. Flanged joints shall be used for above ground piping and exposed piping in vaults and in indoor pipe galleries.

2.05 GROOVED END PIPE AND FITTINGS

A. Grooved end pipe and fittings shall be acceptable for above-ground installation.

B. Pipe shall conform to ANSI/AWWA C606.

C. Grooved end pipe shall be minimum thickness to conform to former Class 53.

D. Grooved end joints shall be flexible type, radius cut grooved, conforming to AWWA C606.

E. Grooved end fittings shall be ANSI B16.1, radius cut grooved, rigid joint, as manufactured by Victaulic Company, Gustin-Bacon, or approved equal.

F. Grooved end pipe adapter flanges shall be ductile iron, ASTM A536, Victaulic, Gustin-Bacon, or approved equal.

G. Bolts shall be manufactured standard.

H. Gaskets for grooved end joints shall be manufacturer’s flush-seal type specifically designed for cast surfaces. Properties shall be as designated in ASTM D 2000. Dimensions shall conform to AWWA C606. Lubricant shall be manufacturer’s standard.
I. Install in accordance with manufacturer’s printed instructions. Dress cut ends of pipe for couplings and adapters as recommended.

2.06 LININGS AND COATINGS

A. Pipe and fittings for wastewater service shall be ceramic epoxy lined with PROTECTO 401 or approved equal. The lining must be factory applied by certified installers and warranted by the pipe manufacturer.

B. Below ground pipe and fittings shall receive a minimum 1 mil thick bituminous coating per AWWA C151 for ductile iron pipe, AWWA C115 for flange pipe and AWWA C110 for fittings.

C. Pipe and fittings exposed to view in the finished work shall not receive the standard bituminous or asphalt coat on the outside surfaces, but shall be shop primed on the outside with one coat of a rust inhibitive primer. Should portions of the pipe inadvertently be given the outside coating of coal tar enamel instead of the rust inhibitive primer as required for exposed piping, the surfaces shall be sealed with a non-bleeding sealer coat. Sealer shall be a part of the work of this Section. Exposed pipe inside wet well shall be finished with two coats of coal tar epoxy with a minimum DFT of 16 mil. Exposed pipe outside wet well shall be finished with two coats of polyurethane enamel with a minimum DFT of 4 mil.

D. Pipe and fitting installations in corrosive earth between the limits shown on the drawings or as required by the Engineer shall be fully encased in an 8 mil polyethylene sleeve in accordance with ANSI A21.5 Method "A".

2.07 SPECIAL PIPE AND FITTING

A. Long span flange pipe shall be minimum pressure Class 350. Gaskets shall be Toruseal type with o-ring or equal.

B. Wall castings shall be of the size and types shown on the Drawings and bituminous coated.

C. Flexible joint (ball joint or river crossing) type pipe shall be as shown on the drawings or comply with ANSI/AWWA C151/A21.51 and ANSI/AWWA C110/A21.10. Pipe shall provide a variable deflection of up to 15 degrees. The spherical threaded socket shall be manufactured in conformance with AWWA C110 and ANSI B2.1.

2.08 RESTRAINED JOINTS

A. Location and number of restrained joints shall be as shown on the drawing or be field determined in accordance with the necessary laying lengths when installing the pipe.

B. Joint shall be the standard design of the pipe and fitting manufacturer and shall provide a 2:1 safety factor.
C. Restrained joints shall be designed for a pressure class rating of 350 psi in sizes 4 inch through 12 inch and 250 psi for 14 inch through 64 inch unless shown otherwise on the drawings.

D. Bolts and nuts for restrained joints shall be low alloy, high strength steel.

PART 3 - EXECUTION

3.01 HANDLING PIPE AND FITTINGS

A. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe or coatings. Pipe or fittings shall not be dropped. All pipe or fittings shall be examined before laying, and no piece shall be installed which is found to be defective. Any damage to the pipe coatings shall be required as directed by the Engineer.

B. All pipe and fittings shall be subjected to a careful inspection prior to being laid or installed.

C. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner at no additional expense to the Owner. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work, and when installed or until they are used in the work, and when installed or laid, shall conform to the lines and grades required.

3.02 LAYING PIPE AND FITTINGS

A. Ductile iron pipe and fittings shall be installed in accordance with requirements of ANSI/AWWA C600 except as otherwise provided herein.

B. All pipe shall be sound and clean before laying. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by watertight plugs or other approved means.

C. Suitable excavations shall be made in the trench bottom to receive pipe with raised bells.

D. As soon as the excavation is completed to the normal grade of the bottom of the trench, immediately place screen gravel or crushed stone (where applicable) bedding in the trench, and then the pipe shall be firmly bedded in this material to conform accurately to the line and grade indicated on the Drawings. Blocking under the pipe will not be permitted. Bedding shall conform with minimum AWWA Type 2 condition unless otherwise specified.

E. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a "Tyton" type bell shall be beveled to conform to the manufactured spigot end. The lining shall remain undamaged.
3.03 JOINTS

A. Push-on joints shall be made in strict accordance with the manufacturer's instructions. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe, and the joint surfaces cleaned and lubricated. The plain end of the pipe is to be aligned with the bell of the pipe to which it is to be joined, and pushed home with a jack or by other means. After joining the pipe, a metal feeler shall be used to make certain that the rubber gasket is correctly located.

B. Mechanical joints at valves, fittings, and where designated on the Drawings and as specified, shall be in accordance with the "Notes on Method of Installation" under ANSI A21.11 and the instructions of the manufacturer. To assemble the joints in the field, thoroughly clean the joint surfaces and rubber gasket with soapy water before tightening bolts. Bolts shall be tight to the specified torques. Under no condition shall extension wrenches, pipe over handle or ordinary ratchet wrenches be used to secure greater leverage.

C. Ball joints, where designated on the drawings and as specified, shall be installed in strict accordance with the manufacturer's instructions. Where ball joint assemblies occur at the face of structures or tanks, the socket end shall be at the structure or tank and the ball end assembled to the socket.

D. Flanged joints shall be in accordance with ANSI A21.15 including its Appendix "A" and the instructions of the manufacturer. Flanged joints shall be fitted so that the contact faces bear uniformly on the gasket and then are made up with relatively uniform bolt stress.

E. All valves, hydrants, fittings and other appurtenances needed upon the pipe lines shall be set and jointed as indicated on the Drawings or as required by the manufacturer.

F. Unless otherwise noted, underground piping shall be push-on joint or mechanical joint with restraints as needed and above ground or exposed piping shall be flanged or grooved end.

G. Deflected bell pipe shown on the Drawings is shown only as an assistance in illustrating a preferred means of installation in specific locations, and is not intended to indicate all deflected bell pipe necessary to effect the installation as shown in plan and profile views. The cost of all such deflections shall be included within the bid price for furnishing and installing the pipe.

H. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane, or where long radius curves are permitted, the amount of deflection shall not exceed deflection recommended by manufacturer.

3.04 PIPE THRUST BLOCKS

A. Thrust blocks will not be allowed on the project.
3.05  RESTRAINED JOINTS

A. Section of piping designated on the Drawings as having restrained joints or those requiring restrained joints shall be constructed using mechanical or compression joint pipe and fittings, manufacturer's standard, equal to U.S. Pipe TR-FLEX, or where permitted by the Engineer with Mega-lug, JCM, Dependo-lok, Uniflange, or equal restraining devices. Mechanical joint ductile iron pipe retainer glands will not be permitted unless approved by the Engineer.

B. Restrained pipe joints that achieve restraint by incorporating cut out sections in the wall of the pipe shall have a minimum wall thickness at the point of cut out that corresponds with the minimum specified wall thickness for the rest of the pipe.

C. The minimum number of restrained joints required for resisting forces at fittings and changes in direction of pipe shall be determined from the length of restrained pipe on each side of fittings and changes in direction necessary to develop adequate resisting friction with the soil. The formula and parameters given in the latest edition of the Ductile Iron Pipe Handbook shall be used to determine the minimum requirements.

\[ L = \frac{1.5PA(1-\cos X)}{fW} \]

Where:
- \( L \) = length of pipe on each side of fitting or change in direction
- \( P \) = 150 psi, unless otherwise noted
- \( A \) = cross-sectional area in square inches based on outside diameter (O.D.) of pipe
- \( X \) = angle of bend or change in direction in degrees
- \( f \) = coefficient of friction = 0.4 (maximum)
- \( W \) = \( W_{\text{earth}} + W_{\text{pipe}} + W_{\text{water in pipe}} \)
- \( W_{\text{earth}} = (\text{density of soil}^* \times \text{depth of cover in feet} \times \text{O.D. in feet}) \times 2 \)

* Maximum 120 lbs./C.F. at and above maximum water table elevation and 60 lbs./C.F. below the maximum water table elevation.

D. The Contractor shall also provide restrained joints in accordance with the above criteria wherever thrust blocks are not used in conjunction with below ground fittings on lines 10 inches in diameter or less.

3.06  PRESSURE & LEAKAGE TESTS

A. Hydrostatic pressure and leakage test shall conform with AWWA C600, with the exception that the Contractor shall furnish all gauges, meters, pressure pumps and other equipment needed to test the line.

B. The pressure required for the field hydrostatic pressure test shall be 150 psi. The Contractor shall provide temporary plugs and blocking necessary to maintain the required test pressure. Corporation cocks at least 3/4 inches in diameter, pipe riser and angle globe valves shall be provided at each pipe dead-end in order to bleed air from the line. Duration of pressure test shall be at least two hours. The cost of these items shall be included as a part of testing.
C. The leakage test shall be a concurrent test, at the maximum operating pressure as determined by the Engineer, with the pressure test and shall be not less than two hours in duration. All leaks evident at the surface shall be repaired and leakage eliminated regardless of total leakage as shown by test. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves and accessories shall be removed and replaced. The pipe lines shall be tested in such sections as may be directed by the Engineer by shutting valves or installing temporary plugs as required. The pipe shall be filled with water, all air removed and the test pressure maintained in the pipe for the entire test period by means of a force pump to be furnished by the Contractor. Accurate means shall be provided for measuring the water required at this pressure. The amount of water required is a measure of the leakage.

D. The amount of leakage which will be permitted shall be in accordance with AWWA C600 for all pressure lines.

E. The Contractor must submit his plan for testing to the Engineer for review at least ten (10) days before starting the test. The Contractor shall remove and adequately dispose of all blocking material and equipment after completion and acceptance of the field hydrostatic test, unless otherwise directed by the Engineer. Any damage to the pipe coating shall be repaired by the Contractor. Lines shall be totally free and clean prior to final acceptance.

3.07 CLEANING AND FLUSHING

A. The pipe shall be thoroughly cleaned of all foreign matter before installation. It is the Contractor’s responsibility to insure cleanliness of the pipe during installation and backfilling. At the conclusion of the work, the Contractor shall thoroughly clean all of the pipe, if necessary, by flushing with water or other materials which may have entered during the construction period. Debris cleaned from the lines shall be removed from the lowest outlet. If, after this cleaning, obstructions remain, they shall be removed. After the pipe is cleaned, the Engineer will examine the pipe for leaks. If defective pipes or joints are discovered at this time, they shall be repaired by the Contractor.

3.08 DISINFECTING

A. Before being placed in service, all potable water pipelines shall be chlorinated in accordance with AWWA C651, "Disinfecting Water Mains." The procedure shall be approved by the Engineer. The location of the chlorination and sampling points will be determined by the Engineer in the field. Taps for chlorination and sampling shall be uncovered and backfilled by the Contractor as required.

B. The general procedure for chlorination shall be first to flush all dirty or discolored water from the lines, and then introduce chlorine in approved dosages through a tap at one end, while water is being withdrawn at the other end of the line. The chlorine solution shall remain in the pipeline for at least 24 hours.

C. Following the chlorination period, all treated water shall be flushed from the lines at their extremities and replaced with water from the distribution system.
Bacteriological sampling and analysis of the replacement water shall then be made by the Engineer in full accordance with AWWA C651. The Contractor will be required to rechlorinate, if necessary. The line shall not be placed in service until the requirements of the State and County Public Health Department are met.

D. Special disinfecting procedures shall be used in connections to existing mains, and where the method outlined above is not practical.

E. The Contractor shall make all arrangements necessary with the County Health Department for the collection and examination of samples of water from disinfected water mains. These samples shall be examined for compliance with Department of Health and Rehabilitative Services requirements. Sampling shall be made daily and continuously until two successive examinations be found unsatisfactory, the line shall be flushed and disinfected again. The cost of sampling, flushing and disinfecting shall be included in the contract price and no additional charge shall be made to the Owner for this work.

END OF SECTION
PART 1 - GENERAL

1.01 DISCRIPTION

A. Furnish labor, materials, equipment and incidentals required to install the PVC pipe, fittings and appurtenances shown on the Drawings and specified herein.

1.02 RELATED SECTIONS

A. Section 01340 – Shop Drawings, Working Drawings and Samples
B. Other Sections as applicable.

1.03 REFERENCES

A. PVC piping shall be installed in the locations as indicated in the Drawings.

1.04 QUALIFICATIONS

A. Plastic pipe, fittings, and appurtenances shall be furnished by a single manufacturer who is fully experienced, reputable, and qualified in the manufacture of the items to be furnished. The equipment shall be designed, constructed, and installed in accordance with the best practices and methods and shall comply with these Specifications.

1.05 SUBMITTALS

A. Submit shop drawings in accordance with the General Conditions and Section 01340. Provide dimensioning and technical specifications for piping to be furnished.
B. Submit samples of all materials specified herein.
C. Submit a pipe layout schedule listing pipe size and Class, use, and location.

1.06 TOOLS

A. Special tools, solvents, lubricants, and caulking compounds required for normal installation shall be furnished with the pipe.
PART 2 - PRODUCTS

2.01 MATERIALS

A. Plastic pipe shall be rigid, unplasticized, polyvinyl chloride (PVC) pipe and shall be in accordance with ASTM D1784 and ASTM D1785, ASTM 1120 or in conformance with AWWA C-900, Class 150 psi, and as manufactured by Celanese Piping Systems, Chemtrol Division, Cabot Company, or approved equal.

B. The pipe shall be suitable for field cutting, welding, bending, and coupling; shall be Schedule 80 unless otherwise shown on the Drawings; and shall be of the sizes shown on the Drawings. Pipe supports shall be as specified in Section 15094.

C. All pipe shall be bundled or packaged in such a manner as to provide adequate protection for the ends, whether threaded or flanged, during transportation from the manufacturer.

D. Fittings shall be the socket type for solvent welded joints as designated in ASTM D2467 or D2466, except where threaded as shown on the Drawings, and as designated in ASTM D2464 or flanged as shown on the Drawings and shall be compatible with the pipe where installed. Flanges shall be furnished with 1/8 inch thick full-faced gaskets. Flange bolts and nuts shall be ASTM A276, Type 304 or 316 stainless steel.

E. Plastic tubing shall be clear, flexible, and non-cracking, with a wall thickness that is adequate for the pressures involved and shall be of the sizes as shown on the Drawings.

F. Caulking for plastic pipes in wall sleeves shall be by a mechanical, modular, rubber sealing element placed in between the sleeve and the pipe and expanded to make a tight fit or shall be by another method approved by the Engineer.

G. Expansion joints shall have integral duck and rubber flanges. They shall have individual solid steel ring reinforcement with a carcass of highest grade woven cotton or acceptable synthetic fiber. Joints shall be constructed of pipeline size and shall meet working pressure and corrosive conditions similar to the line where installed. They shall be of a filled arch type construction with a minimum of three arches per joint. All joints must be finish-coated with Hypalon paint to prevent ozone attack. They shall be Style 500 as manufactured by Mercer Rubber Co. of Trenton, New Jersey, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The installation of plastic pipe shall be done in strict accordance with the manufacturer's technical data and printed instructions.
B. Joints for plastic pipe shall be solvent welded, except flanged or threaded where required. In making solvent welded connections, clean dirt and moisture from pipe and fittings, bevel pipe ends slightly with emery cloth, and apply solvent cement. Expansion joints shall be installed every 50 feet on long runs and in every straight run longer than 15 feet.

C. Installation of valves and fittings shall be in strict accordance with manufacturer's instructions. Particular care shall be taken not to overstress threaded connections at sleeves. In making solvent welded connections care shall be taken to ensure that no solvent is spilled on valves or allowed to run from joints.

D. All piping shall have a sufficient number of unions to allow convenient removal of piping and shall be as approved by the Engineer.

E. Where plastic pipe passes through wall sleeves, joints shall be sealed with a mechanical sealing element as specified in Section 15100.

F. All plastic pipe-to-metal pipe connections shall be made using flanged connections. Metal piping shall not be threaded into plastic fittings, valves, or couplings, nor shall plastic piping be threaded into metal valves, fittings or couplings.

G. Concrete inserts for hangers and supports shall be furnished and installed in the concrete as it is placed. The inserts shall be set in accordance with the requirements of the piping layout and the Contractor shall verify their locations from approved piping layout drawings and the structural drawings. Pipe hangers and supports are specified in Section 15094.

3.02 FIELD PAINTING

A. Pipe normally exposed to view shall be painted and marked as specified in the Painting Section 09900. Identify pipe contents, direction of flow, use proper color (per OSHA) and identification of pipe.

3.03 TESTING

A. Pipelines shall remain undisturbed for 24 hours to develop complete strength at all joints. Pipelines shall be subjected to a minimum 150 psi hydrostatic pressure test for 2 hours. All leaks shall be repaired and lines retested as approved by the Engineer. Prior to testing, the pipelines shall be supported in an approved manner to prevent movement during tests.

END OF SECTION
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SECTION 15100
VALVES AND APPURtenances

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish labor, materials, equipment, and incidentals required and ready for operation all valves, couplings, and connectors, etc., as shown on the Drawings and as specified herein.

B. The equipment shall include, but not be limited to the following:
   1. Gate Valves
   2. Ball Valves
   3. Plug Valves
   4. Check Valves
   5. Foot Valves
   6. Wall Sleeves
   7. Valve Box
   8. Flexible Couplings
   9. Union
   10. Flanged Coupling
   11. Wall Sleeve
   12. Hydrants
   13. Concrete Meter Box
   14. Backflow Preventer
   15. Rubber Seat Ball Valves
   16. Air Release Valves
   17. Pressure Reducing Valves
   18. Water Pressure Gauge
   19. Solenoid Valves
   20. Butterfly Valves
   21. Tapping Sleeves and Valves
   22. Corporation Stops
   23. Combination Backpressure Sustaining/Check Valves

1.02 RELATED WORK

A. Section 02221 - Trenching, Bedding and Backfill for Pipe

B. Section 09900 - Painting

C. Section 13300 - Instrumentation and Control

D. Pipe and fittings, in Division 15
1.03 DESCRIPTION OF SYSTEMS

A. Equipment and materials specified herein are intended to be standard items for use in controlling the flow of water, wastewater, chemicals and air.

1.04 QUALIFICATIONS

A. All of the types of valves and appurtenances shall be products of well established reputable firms who are fully experienced, and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these specifications as applicable.

1.05 SUBMITTALS

A. Submit, within 30 days after Contract execution, a list of valves to be furnished, the names of the suppliers and the date of delivery.

B. Complete shop drawings of all valves and appurtenances shall be submitted in accordance with the requirements of Section 01340.

1.06 TOOLS

A. Special tools, handles or wrenches, if required for normal operation and maintenance of the specified valves, shall be supplied with the equipment furnished.

PART 2 - PRODUCTS

2.01 GENERAL

A. All valves and appurtenances shall be of the size shown on the Drawings and all similar valves shall be from one manufacturer.

B. Valves and appurtenances shall have the name of the manufacturer and the working pressure for which they are designed cast in raised letters upon some appropriate part of the body.

C. All valves shall open left, counter-clockwise.

2.02 GATE VALVES

A. Exposed gate valves unless otherwise specified or approved, shall be iron body, bronze mounted, wedge disc gate valves with flanged ends and conforming to the AWWA Standards Specification for Gate Valves for Ordinary Water Works Service, Designation C500-86 rated 150 psi WOG, minimum. Exposed valves shall be outside screw and yoke type. Buried gate valves shall be mechanical joint, ANSI Standard 21.11 except where shown otherwise.

B. Face to face dimension shall conform to ANSI Standard Face to Face and End to End Dimensions of Ferrous Valves, (ANSI B16.10) for 125 pound cast-iron valves.
C. Bronze gate rings shall be fitted into grooves of dovetail or similar shape in the gates. For grooves or other shapes, the rings shall be firmly attached to the gates with bronze rivets.

D. Gate valves shall have a resilient rubber seated ring or wedge permanently bonded to the wedge disc and complying with AWWA C509-80.

E. Stuffing box follower bolts shall be of steel and the nuts shall be of bronze.

F. The design of the valves shall be such as to permit packing the valves without undue leakage while they are wide open and in service. O-ring stuffing boxes may be used.

G. Where indicated on the Drawings or necessary due to location, size, or inaccessibility, chain wheel operators shall be furnished with the valves. Such operators shall be designed with adequate strength for the valves with which they are supplied and to provide for easy operation of the valve. Chains for valve operators shall be galvanized.

H. Where required, gate valves shall be provided with a box cast in the slab and a box cover. Length of box shall be slab thickness. All buried valves shall have cast iron, sliding type valve boxes as shown on the drawings. Box cover opening shall be for valve stem and nut. Valve wrenches and extension stems shall be provided by the manufacturer to actuate the valves. The box and cover shall be equal to those manufactured by Rodney Hunt Machine Company, Clow Corporation, or equal.

I. Gate valves shall be as manufactured by the Mueller Company, Clow Valve Company, American Darling, or equal.

2.03 BALL VALVES FOR PVC PIPE

A. Ball valves for PVC pipe shall be of PVC Type 1 with union, socket, threaded or flanged ends as required. Ball valves shall be full port, full flow, all plastic construction, 150 psi rated with teflon seat seals and T-handles. PVC ball valves shall be as manufactured by Celanese Piping systems, Inc., Nibco True-Bloc, Wallace and Tiernan Inc., Plastiline, Inc., or equal.

B. All valves shall be mounted in such a position that valve position indicators are plainly visible when standing on the floor.

2.04 RUBBER SEAT BALL VALVES

A. All ball valves shall be of the tight closing, shaft-mounted type that fully comply with AWWA Standard C507. Valve design shall be such as to eliminate metal to metal contact or wedging in the sealing action. Design pressure ratings shall be 150 psi SWP and provide drop tight shutoff against flow in both directions. Design of valve shall be such that with the valve in the open position, the full and unobstructed circular inlet and outlet port diameter shall be as specified in Table 1 of AWWA Standard C507. With the valve in the closed position, valve shall be drop tight at rated pressure. The manufacturer shall have manufactured tight-closing, rubber seat ball valves in the specified service for a period of at least five years.
B. The valve body shall have integral support legs or pads and shall consist of two body end pieces and a center body piece through-bolted and O-ring-sealed against leakage. All body pieces shall be of cast iron ASTM A126 Class B. Minimum body thickness shall be as specified in Table 2 of AWWA Standard C507. Flanges shall be flat-faced and flange drilling shall be in accordance with ANSI B16.1 Class 125.

C. The valve plug shall be constructed of cast iron ASTM A48, Class 40, and shall be taper-pinned to an upper and lower fitted shaft of 18-8 Type 304 stainless steel that is turned, ground and polished to a 32 micro-inch or smoother finish per ANSI B46.1. Valves employing chromium-plated iron or steel shafts or trunnions shall not be accepted.

D. The center section shall be fitted with sleeve-type bearings contained in the body hubs. Bearings shall be corrosion resistant and self-lubricating with fiberglass backing. Bearing surfaces shall be isolated from flow by O-ring type seals. The plug assembly shall be supported by a two-way thrust bearing assembly consisting of a stainless steel stud and thrust collar in a grease-packed cavity.

E. In single-seated valves, there shall be one set of plug and body seats. In double-seated valves, there shall be two sets of plug and body seats. Single-seated valves shall provide drop-tight closure in one direction. Double-seated valves shall provide drop-tight closure in two directions.

F. All seats shall be of a synthetic rubber compound. Seats shall be retained in the valve body by mechanical means without retaining rings, segments, screws or hardware of any kind in the flow stream. Seats shall seal a full 360 degrees without interruption and have a plurality of grooves mating with a spherical stainless steel seating surface on the plug. Valve seats shall be field adjustable around the full 360 degrees circumference and replaceable without dismantling the operator, plug or shaft. Where line size permits, seats shall also be capable of being replaced or adjusted without removing the valve from the line. Manufacturer shall certify that the rubber seat is field adjustable and replaceable.

G. Ball valves shall be Watts Model B6080, or equal.

H. Instrument Air Shutoff Valve: Stainless steel body ball valve, nylon handle.

1. Manufacturers and products:
   a. Whitey; Series 40;
   b. Imperial Eastman; Series 200;
   c. Or equal

I. Ball Valve for Chlorine Liquid and Gas: 600-pound WOG, carbon steel body, monel ball and stem, reinforced Teflon seat, Teflon seals, double stem seal, lever operator, screwed ends, nonlubricated, and comply with the requirements of the Chlorine Institute Pamphlet 6.
1. Manufacturer and Product: Wallace & Tiernan, or equal

2.05 PLUG VALVES

A. Plug valves shall be non-lubricated eccentric type with resilient faced plugs, and shall be furnished with end connections as shown on the plans. Flanged valves shall be faced and drilled to the ANSI B16.1 Class 125 standard. Mechanical joint ends shall be AWWA C111. Bell ends shall be to the AWWA C100 Class B. Grooved ends shall be AWWA C606.

B. Port areas for valves shall be 100% of full pipe area.

C. Valve bodies shall be of ASTM A126 Class B cast iron in compliance with AWWA Standard C507-73 Section 5.1 and AWWA Standard C504-80. All exposed nuts, bolts, springs, washers, etc. shall be zinc plated. Resilient plug facings shall be of Neoprene or Hycar on a single piece plug. The plug shall be of sufficient construction so that no strengthening member is required opposite the face.

D. Valves shall be furnished with corrosion resistant seats which comply with AWWA Standard C507 Section 7 paragraph 7.2 and with AWWA Standard C504 Section 3.5. The seat shall be in the body only. Seat ring shall be adjustable and replaceable.

E. Valves shall be furnished with replaceable, sleeve-type bearings in the upper and lower journals. These bearings shall comply with AWWA Standard C507-73 Section 8 paragraphs 8.1, 8.3 and 8.5 and with AWWA Standard C504 Section 3.6.

F. Valve shaft seals or packing shall be adjustable and replaceable without removing the valve from service or interrupting service with flow in either direction. Shaft seals shall comply with AWWA Standard C507-73 Section 10 and with AWWA C507-70 Section 111.

G. Valve pressure ratings shall be as follows and shall be established by hydrostatic tests as specified by ANSI Standard B16.1. Pressure ratings shall be 175 psi for valves through 12", 150 psi for valves in sizes 14" through 36" and 125 psi for valves in sizes 42" through 54". Valves shall be capable of providing drip-tight shutoff up to the full valve rating with pressure in either direction.

H. All valves 8 inches and larger shall be equipped with gear actuators. All gearing shall be enclosed suitable for running in oil with seals provided on all shafts to prevent entry of dirt and water into the actuator. All shaft bearings shall be furnished with permanently lubricated bronze bearing bushings. Actuator shall clearly indicate valve position and an adjustable stop shall be provided. Construction of actuator housing shall be semi-steel.

I. Plug valves installed such that actuators are 6 feet or more above the floor, shall have chainwheels and chains provided.

J. Where shown on the Drawings, plug valves shall be installed with extended shafts and actuators. Actuators for extended shafts shall be mounted on floor stands where indicated on the Drawings or shall be removable handwheels where floor stands are not called for. Six inch sleeves shall be provided for extended shafts in all floors; where
necessary covers shall be provided. Shafts shall be of adequate strength to operate the valve. Floor stands and covers, where called for shall be cast iron. Floor stands shall be equipped with valve position indicators and a lock for the handwheel.

K. All plug valves shall be installed so that the direction of flow through the valve is in accordance with the manufacturer's recommendations.

L. Valves and actuators shall be as manufactured by, Pratt, DeZurik, M&H, Victaulic, or equal.

2.06 CHECK VALVES

A. Check valves for cast iron and ductile iron pipelines shall be swing type and shall meet the material requirements of AWWA Specification C508. The valves shall be iron body, bronze mounted, single disc, 150 psi minimum working water pressure, nonshock, and hydrostatically tested at 300 psi. Ends shall be 125 pound ANSI B16.1 flanges or 125 pound ANSI B2.1 threaded fittings depending upon location.

B. When there is no flow through the line the disc shall hang lightly against its seat in practically a vertical position. When open, the disc shall swing clear of the waterway.

C. Check valves shall have bronze seat and body rings, extended bronze hinge pins and bronze nuts on the bolts of bolted covers.

D. Valves shall be so constructed that disc and body seat may easily be removed and replaced without removing the valve from the line. Valves shall be fitted with an extended hinge arm with outside lever and spring. Springs with various tensions shall be provided and springs approved by the Engineer shall be installed.

E. Check valves for cast and ductile iron pipelines shall be as manufactured by Pratt, M&H, American Darling, or equal.

F. Check valves for PVC pipe shall be of PVC Type 1, Series BC with union, socket, threaded or flanged ends as required. PVC ball check valves shall be as manufactured by Celanese Piping Systems, Inc., Nibco Chemtrol, Wallace & Tiernan Inc., Plastiline, Inc., or equal.

2.07 FOOT VALVE

A. Foot valves shall be supplied on the suction lines of various chemical feed pumps. The valves shall be PVC Type 1 construction, Viton ball and body seal, PVC strainer, and shall be supplied with spigot end connector and union nut.

B. Foot valves shall be Model No. 8333 as manufactured by Plastiline Inc., Pompano Beach Florida, Peabody-Barnes, Mansfield, Ohio, or equal.

2.08 VALVE BOXES

A. All buried valves shall have cast iron, three piece valve boxes with cast iron covers. Valve boxes shall be provided with suitable heavy bonnets and to extend to such elevation at or slightly above the finished grade surface as directed by the Engineer. The barrel shall be one or two-piece, screw type, having 5 1/4 inch shaft. Covers shall have
"WATER", "SEWER" or "AIR" cast into the top. All valves shall have actuating nuts extended to within six inches of the top of valve box cover.

2.09 FLEXIBLE COUPLINGS

A. Flexible couplings shall be either the split type or the sleeve type as shown on the Drawings.

2.10 UNION

A. Unions on ferrous pipe 2 inches in diameter and smaller shall be 150 pounds malleable iron, zinc coated. Unions on water piping 2 1/2 inches in diameter and larger shall be flange pattern, 125 pound class, zinc-coated. Gaskets for flanged unions shall be of the best quality fiber or plastic. Unions shall not be concealed in walls, ceilings or partitions.

2.11 ANGLE METER STOP

A. Angle meter stops shall be manufactured by Mueller Catalog No. H-14258 and be the 90 degree angle type with lockwing head shut-off.

2.12 FLANGED COUPLING ADAPTER

A. Coupling adapter shall be Smith-Blair Model No. 912, or equal. Body and follower flange shall be iron. Bolt circle, size and spacings shall conform to ASA 125 flange. Gasket shall be Smith-Blair Grade 30 or 60, or equal. O-Ring shall be grade 60. Cross and tee bolts shall conform to ANSI A21.11.

2.13 WALL SLEEVE

A. The pipe to wall penetration closures shall be sealed with EMBECO mortar.

2.14 HYDRANT

A. Hydrants shall have a 6" pipe connection, 5 1/4" main valve opening, two 2 1/2" hose nozzles, and one 4 1/4" Hydrants shall be cast iron body, fully bronzed mounted, suitable for a working pressure of 150 pounds and shall be in accordance with the latest specification of the AWWA C-502. They shall be of the O-ring seal type. Operating nut shall open counter-clockwise and be of the pentagonal shape, measuring 1 1/2" from point to opposite flat.

B. Hydrants shall be painted one coat of zinc chromate primer and two finish coats of an approved paint as directed by the Owner.

C. Hydrants shall be "Centurion" Number A-423, Traffic Type, as manufactured by Mueller Company, or an approved equal. Furnish one operating manual and one hydrant wrench.

2.15 CONCRETE METER BOX

A. Concrete meter box shall be Series No. 37-T by Brooks Products, Inc., Medley, FL, or equal.
B. Box body shall be precast concrete with a cast iron traffic cover weighing 27 lbs. Body shall be nominal 12 inch deep.

C. Set box in concrete side walk as shown on the drawings.

2.16 BACKFLOW PREVENTER

A. Backflow preventer shall be an approved reduced pressure zone backflow preventer conforming to the requirements of Section 4620 of the South Florida Building Code, Broward edition. Units shall meet the following standards; ASSE 1013, AWWA C506, AND U.L. EX3185.

B. Backflow preventer shall be Model No. U909S by Watts Regulator, Andover, MA, Febco Model 825Y, or equal. The unit shall come complete with two independent check valves, strainer and ball type test cocks. Body shall be bronze construction with tight seating rubber check valves. Ball valve test cocks shall be bronze. Joints shall be N.P.T. and gate valves shall be non-rising stem.

C. Unit shall be rated for 175 psi. One inch diameter units shall have no more than a 13 psig pressure drop at 30 gpm.

2.17 RESILIENT SEAT BALL VALVE

A. Ball valve shall be tight closing, shaft-mounted that complies with Fed. Spec. WW-V-35, Type II, Class C, Style 3. Valve design shall eliminate metal to metal contact or wedging in the sealing action. Design pressure rating shall be greater than 150 psi.

B. Valve body shall be one or two piece stainless steel ASTM A351. Ball shall be stainless steel ASTM A276. Seat ring shall be reinforced TFE.

C. Valve shall have a stainless steel 1/4 turn lever arm. Ends shall be threaded. Ball valve shall be Figure No. T-580-S6-R-66 as manufactured by Nibco, Inc. or equal.

2.18 AIR RELEASE VALVE

A. The air release valves for use in water mains shall be installed as shown on the Drawings. The valves shall have a cast iron body, cover and baffle, stainless steel float, bronze water diffuser Buna-N or Viton seat and stainless steel trim. Valves shall be provided with a vacuum check to prevent air from reentering the line. The fittings shall be threaded. The air release valves shall be Model 200WD as manufactured by APCO Valve and Primer Corporation, Schaumburg, Illinois; Model 45VC by Val-Matic Valve and Manufacturing Corporation, Lyons, Illinois or equal.

B. The two valve air release valves for use in sewage force mains shall be provided in air release valve enclosures. One valve shall be a sewage air release valve and the other shall be a sewage air/vacuum valve, both with stainless steel trim. Each valve shall be supplied by the same manufacturer. Valve shall be Val-matic Model No. 485/30/S or equal by APCO. The valves shall be as follows:

1. Sewage Air/Vacuum Valve: The valve body shall be of cast iron ASTM A126-B; the floats, float guide, and stem shall be of stainless steel Type 316. The resilient
seat shall be of Buna N. The valve shall be suitable for 150 psig working pressure. Valve shall have standard 2-inch NPT inlets and outlet ports. Provisions shall be made for back-flushing the valve with clean water. The overall height of the valve not including the flushout attachment shall not exceed 22 inches.

2. Sewage Air Release Valve: The valve body and cover shall be of cast iron construction, ASTM A126-B, and all internal working parts shall be of stainless steel Type 316. The venting orifice shall be of 3/8-inch in diameter and the seating material shall be of Viton. The inlet opening shall be standard 2-inch NPT screwed connection. The valve shall include a flush-out feature for periodic cleaning of the internal mechanism. The overall height of the valve body shall not exceed 21 inches.

2.19 PRESSURE REDUCING VALVE

A. Valve shall be forged brass or cast iron body fully bronze mounted, direct acting bronze internal trim, reinforced neoprene diaphragm. Valves shall have an inlet side pressure gauge connection and adjusting screw or "T handle.

B. Valve sizes smaller than 1/2 inches shall have screwed ends; those 2 inches or larger, flanged ends and those in between these sizes shall have union ends.

C. Strainers shall be of the "Y" type. Strainers shall have bronze bodies with a removable bronze screen and shall be as manufactured by Watts Regulator Company, Lawrence, MA, or equal.

D. The pressure reducing valve shall be as manufactured by Watts Regulator Co., Series No. 223 SHP, or equal.

2.20 WATER PRESSURE GAUGE

A. Pressure gauge shall be direct mounted, cast aluminum case, with a 3 1/2-inch diameter dial and furnished with a clear glass crystal window, 1/4-inch shut-off valve, and a bronze pressure snubber. Gauges shall be weather proof. The face dial shall be white finished aluminum with jet black graduations and figures. The face dial shall indicate the units of pressure being measured (e.g., feet, inches, etc.) or be dual scale.

B. Pressure gauge shall be equal to Model 600 as manufactured by H.O. Trerice Co., or equal.

2.21 SOLENOID VALVE

A. Solenoid valve shall be normally closed. Solenoid valve shall include a manual override operator. Valves shall be of brass body construction, resilient seating, general purpose service Red-Hat type as manufactured by Automatic Switch Co. (ASCO), Florham Park, NJ or equal.

B. Solenoid valve shall be suitable for operation on a 120 volt, 60 Hertz power supply unless otherwise shown on the Drawings and be provided in a NEMA 4, water-tight enclosure.
2.22 BUTTERFLY VALVES

A. Butterfly valves and operators shall conform to the latest revision of AWWA Standard Specification C504. Butterfly valves for solids contact clarifier and multi-media filter, supplied by the manufacturer, shall be DeZurik Figure 632, or equal.

B. Valves 20” and smaller shall be in full accordance with AWWA Class 105B. Valves 24” and larger shall comply with the requirements of the AWWA class needed to meet the most severe actual operating conditions.

C. Valve bodies shall be of cast iron per ASTM A126, Class B. Flanged valves shall be of the short body design with 125 pound flanged ends faced and drilled per ANSI B16.1 standard for cast iron flanges. Mechanical joint ends shall meet the requirements of AWWA C111/ANSI A21.11. Body thickness shall be in strict accordance with AWWA C504.

D. Discs shall be offset to provide an uninterrupted 360 degree seating edge and shall be cast iron per ASTM A-48 or A-126. Ductile iron disks shall be per ASTM A-536. The disc seating edge shall cover the full width of the disk edge and shall be 316 stainless steel. The disc shall be securely attached to the valve shaft using 316 stainless steel pins.

E. The valve shaft shall be of type 304 stainless steel. Its diameter shall meet AWWA C504 for Class 150B.

F. The seat shall be of Buna-N for water, sewage or effluent, or EPDM for air service, and shall be recess mounted and mechanically retained in the valve body. Compression between the seat and disc edge shall be adjustable and the seat shall be replaceable without disassembly of the disc and shaft. Seats bonded to valve bodies or the use of fillers to increase seat compression shall not be acceptable. Seat bond must withstand 75 lbs. pull under test procedure ASTM D-429, method B. 20” and smaller valves shall have seats that are simultaneously molded in, vulcanized and bonded to the body.

G. Valves shall be fitted with sleeve type bearings. Bearings shall be corrosion resistant and shelf lubricating. Bearing load shall not exceed 1/5 of compressive strength of the bearing or shaft material.

H. Valve shaft seals for 4” - 24” flanged - and for all sizes of mechanical joint end valves - shall be of self-compensating V-type packing. Flanged valves 30” and larger shall have adjustable V-type packing with bronze packing glands.

I. Unless otherwise specified, interior cast iron or steel surfaces of each valves shall be shop painted per the latest revision of AWWA C-504.

J. Each valve shall be factory tested per the latest revision of AWWA C-504.

K. Butterfly valves shall be Henry Pratt Company or approved equal, except as noted above.

L. Valves 4” - 20” shall have available handwheel actuators of the traveling nut type, in complete conformance with AWWA C-504. Housing will be of cast iron, in both weatherproof and buryable constructions, with optional chainwheel, crank or 2” square
nut inputs. All units shall have adjustable open and closed position stops, with provision to prevent accidental adjustment changes.

M. Butterfly valves denoted as "lockable" on the drawings shall be equipped with a chain and lock assembly to prevent vandalism.

N. The valve manufacturer shall provide all components for air valves appropriate for up to 300°F service.

2.23 TAPPING SLEEVE AND VALVE

A. Tapping Sleeve:

1. Tapping sleeves shall fit existing cast iron, ductile iron, PVC or AC water mains, and the Contractor shall determine the outside diameter of the pipe before ordering the sleeve.

2. Tapping sleeves shall be cast iron or ductile iron, designed for a working pressure of at least 150 psi for connections to distribution systems.

3. The tapping sleeve shall be mechanical joint ended, on the run, and shall have a connecting flange outlet, with centering groove, for connecting to the tapping valve. The flange outlet on tapping sleeves for the transmission mains shall be drilled to fit Class 250 flanges. The connecting flange joint between the tapping sleeve and the tapping valve shall be industry standard, however, the tapping sleeve must be interchangeable with tapping valves by other manufacturers.

4. The tapping sleeve shall be furnished complete with all necessary longitudinal gaskets, glands, split end gaskets, and bolts and nuts, as specified below under TAPPING VALVES, or shall be standard carbon steel square, hex, or T-head bolts and nuts, which have been galvanized.

5. The tapping sleeve shall be furnished with a tapped and plugged outlet for testing purposes. Threads shall be ANSI B2.1 (NPT). Tapping sleeve and valve shall be hydrostatically tested after installation and prior to tapping.

B. Tapping Valves:

1. Tapping valves shall be as specified for Gate Valves, herein above and as further specified herein.

2. The valves for connection to distribution system shall have a standard mechanical joint end for connection to new piping, and a flange inlet with centering ring, for connecting to the tapping sleeve, which shall be interchangeable with other manufacturers' tapping sleeves.

2.24 CORPORATION STOP

A. AWWA C800 type, tapered threaded inlet, except when connecting to tapped fittings which require IPS tapered threads, outlet compression connection or IPS threads to suit connecting pipe, stop 1 inch smaller rated 100 psi, larger stop rated 80 psi.
1. Manufacturers and Products:
   a. Ford Meter Box Co.;
   b. Mueller Co.;
   c. Or equal.

2.25 COMBINATION BACK-PRESSURE SUSTAINING/CHECK VALVE THREE INCHES AND LARGER
   
   A. Hydraulically operated, diaphragm actuated, pilot controlled globe valve, cast iron, ductile iron, or steel body, rated 175 psi, ANSI B16.1 flanged ends, bronze or stainless steel trim, stainless steel stem, externally mounted strainers with cocks, solenoid and limit switch, single pole double throw, 120V AC rated, and minimum upstream pressure and prevents backflow.

   B. Size(s) and rating(s) as follows:
      1. 8-inch, maximum of 1600 gpm with back pressure set at 15 psig minimum.

   C. Manufacturers and Products:
      1. Cla-Val; Model 51G-01,
      2. WATTS; ACV
      3. Golden Anderson;
      4. Singer;
      5. Inbal Series 700
      6. OCV Model 108
      7. Ross Valve
      8. Or equal

PART 3 - EXECUTION

3.01 INSTALLATION

   A. Valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Engineer before they are installed.

   B. Install floor boxes, brackets, extension rods, guides, the various types of operators and appurtenances that are in masonry floors or walls, and install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all plans and figures which have a direct bearing on their location and he shall be responsible for the proper location of these valves and appurtenances during the construction of the structures.

   C. Flanged joints shall be made with hot dipped galvanized bolts, nuts and washers. Mechanical joints shall be made with mild corrosion resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe. All buried bolts and nuts shall be heavily coated with two (2) coats of bituminous paint.
D. Prior to assembly of split couplings, the grooves as well as other parts shall be thoroughly cleaned. The ends of the pipes and outside of the gaskets shall be moderately coated with petroleum jelly, cup grease, soft soap or graphite paste, and the gasket shall be slipped over one pipe end. After the other pipe has been brought to the correct position, the gasket shall be centered properly over the pipe ends with the lips against the pipes. The housing sections shall then be placed. After the bolts have been inserted, the nuts shall be tightened until the housing sections are firmly in contact, metal-to-metal, without excessive bolt tension.

E. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6 inches from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle pipe already laid. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flares. After the bolts have been inserted and all nuts have been made up fingertight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.

F. Valve boxes shall be installed as shown on the Drawings. Joints shall be made in the standard manner. Valve stems shall be vertical in all cases. Place cast iron box over each stem with base bearing on compacted fill and top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. Remove any sand or undesirable fill from within the valve box.

3.02 SHOP PAINTING

A. Ferrous surfaces of valves and appurtenances shall receive an exterior coating of rust-inhibitive primer. Interior coatings shall be the manufacturer’s standard except that valves for potable water lines shall be coated with paints approved by EPA, FDA and AWWA for potable water service. All pipe connection openings shall be capped after shop painting to prevent the entry of foreign matter prior to installation.

3.03 FIELD PAINTING

A. All metal valves and appurtenances specified herein and exposed to view will be painted as part of the work. Paint in accordance with the requirements of Section 09900.

3.04 INSPECTION AND TESTING

A. Completed pipe shall be subjected to hydrostatic pressure test for 2 hours at 150% full working pressure. All leaks shall be repaired and lines retested until approved by the Engineer.

B. Backflow preventer shall be hydrostatically tested in accordance with the South Florida Building Code, Broward edition. The technician shall prepare a certificate indicating test results of the installed unit and approval of installation.
PART 1 - GENERAL

1.01 SCOPE OF WORK
   A. This section specifies the quality criteria, design standards, materials, and installation procedures not otherwise specified, and required for electrical motors furnished under other sections of these Contract Documents.

1.02 RELATED SECTIONS
   A. Section 01340 – Shop Drawings, Working Drawings, and Samples
   B. Section 01730 – Operating and Maintenance Data
   C. Section 01740 – Warranties and Bonds

1.03 SHOP DRAWING SUBMITTALS
   A. Furnish and submit shop drawings, operation and maintenance manuals, etc. as outlined in Paragraph 1.02 (A), the submission shall include the following technical information:
      1. Motor Efficiency
      2. Motor Torque Speed Curves from Zero to Full Load Speed
      3. Nameplate Data
   The above information shall be supplied as part of the submittal on the equipment that the motor drives.

1.04 STANDARDS
   A. Electric motors shall conform to the latest standards of IEEE, ANSI, and NEMA except as otherwise specified herein.

1.05 CONDITIONS OF SERVICE
   A. Continuous Duty
   B. Altitude – below 3300 feet
   C. Ambient temperatures – 0 to 40 °C (maximum)
   D. Voltage variation – +/- 10%
   E. Frequency variation – +/- 5%
   F. Combined voltage and frequency variation – +/- 10%. Frequency variation not to exceed +/- 5%.
   G. Across-the-line starting, if not otherwise noted.
1.06 TESTING

A. Each motor shall be shop tested to determine compliance with requirements of the IEEE, ANSI, and NEMA. Tests shall be as follows:

B. Testing

Each motor shall be subjected to a standard short commercial test including the following:
1. Running light current
2. Locked rotor current
3. Secondary voltage at collector rings (wound rotor motors)
4. Winding resistance
5. Winding reactance
6. Bearing inspection
7. Full load current

C. Test Reports

Copies of all test results shall be submitted to the Engineer for review. The number of copies of the tests shall be the same as the number of Shop Drawings to be submitted. Single copies of witnessed test raw data shall be submitted to the Engineer immediately upon completion of such tests.

1.07 TOOLS AND SUPPLIES

A. Furnish all special tools necessary to disassemble, service, repair, and adjust the equipment.

PART 2 - PRODUCTS

2.01 GENERAL

A. Motors covered in this section shall be full voltage start, constant speed, squirrel cage induction motors, unless specifically stated to be otherwise. The driven equipment manufacturer shall be responsible for supplying the motor and shall factory mount the motor to ensure proper coordination. Provide tropical/fungus protection for windings.

2.02 DESIGN OF MOTORS

A. Horsepower

The driven equipment manufacturer shall be responsible for sizing the motors in coordination with the driven equipment, so that the nameplate rated horsepowers are not exceeded and motors are not required to operate beyond their operating range. The ENGINEER reserves the right to reject driven equipment that requires motors larger than minimums specified in the other Sections of these specifications, or to require the Contractor to bear additional costs of larger electrical equipment.
B. Temperature Rise

Motors shall conform to standards of NEMA Class FTropicalized Insulation System, and shall be limited to Class B Temperature Rise, unless otherwise listed in other parts of these specifications.

C. Voltage and Current

Fractional horsepower motors (i.e., less than 1/2 hp) shall be 115/230V, 60 Hz, single phase. Motors 1/2 horsepower through 600 horsepower shall be 460 Volts, 60 Hz, and 3-phase.

D. Service Factor

Unless otherwise specified, service factor shall be a minimum of 1.15.

E. Speed

As specified with equipment.

F. Torque

At least 20% greater than the maximum full load torque requirements of the driven equipment throughout the full operating range of the driven equipment, from start to full load.

G. Efficiency

Motors in the range of 1 hp to 200 hp, inclusive, shall be designed specifically for energy efficiency and high power factor. In accordance with NEMA Standard MG 1-12.53b, each motor shall meet the minimum guaranteed efficiency for the specified nameplate efficiency. All motor efficiency tests shall be performed utilizing the NEMA preferred test method IEEE 112 Method B, Dynamometer. All tests shall be performed in accordance with the procedures contained in NEMA Standard MG 1-12.53.

H. Variable Speed Drives

Motors applied on variable frequency drives shall be specifically designed for variable frequency drives applications in order to be able to handle the extra heating caused by harmonics. Upon request, a statement by the motor manufacturer shall be required to be submitted to the ENGINEER.

2.03 MATERIALS AND CONSTRUCTION

A. Enclosure

The enclosure shall be the type as specified in respective parts of equipment specifications, and shall be constructed of cast iron or fabricated steel of such design as to contain and adequately protect and support all motor components in proper position. Fans may form part of the rotor and shall be of non-sparking material on totally enclosed motors. Enclosures for motors shall be TEFC, unless otherwise stated. Enclosures for variable speed motors shall be rated for inverter duty. Fractional horsepower motor enclosures shall be TENV.
B. Insulation

Motors shall have inorganic, non-hygroscopic insulation, unless otherwise noted in other parts of these specifications. Insulation shall be Class F rating.

C. Stator

1. The stator shall be assembled from high grade electrical sheet steel laminations adequately secured together.

2. The stator windings shall consist of materials such as polyester film, synthetic varnish, or glass cloth. Windings shall be random or form wound, adequately insulated, and securely braced to resist failure due to electrical stress and vibrations.

3. Any junction in motor insulation, such as coil connections or between slot and end winding sections, shall have protection equivalent to that of the slot sections of coils. The entire winding of all motors when finished, shall be epoxy encapsulated, after subjecting to a process which removes all moisture and insures freedom of air pockets.

D. Rotor

The shaft shall be made of high grade machine steel or steel forging of size and design adequate to withstand the load stresses. The rotor shall be fabricated of high grade electrical sheet steel laminations adequately fastened together and to the shaft. Squirrel cage windings may be cast aluminum or bar-type construction with brazed end rings.

E. Bearings

1. Bearings shall be ball or roller. Motors shall be force grease lubricated. Unless specified otherwise, the bearings shall have a B-10 life of 24,000 hrs.

2. For vertical motors, thrust bearings shall be Kingsbury type, ball, or roller bearings, as required for the design thrust load. Guide bearings shall be radial-type ball bearing.

F. Leads and Terminals

Leads shall be suitably marked and identified. Terminal housing locations that are not shown on the Contract Drawings shall be NEMA Assembly F-1.

G. Grounding Means

Each motor shall have adequate means for attaching a 4/0 AWG copper grounding conductor to the motor frame near the base. It shall be a mechanical clamp terminal connector located on the same side as the stator lead junction box.

H. Direction of Rotation

1. Motors shall be designed and manufactured for operation in a direction as required for driven equipment.
2. The phase sequence at the specification rotation shall be marked permanently and plainly inside the stator lead junction box.

I. Noise
All motors shall have an equivalent A-Weighted sound level of 80 dBA as determined in accordance with IEEE Standard No. 85.

J. Drain Plugs
All motors shall have breather and drain plugs to allow proper drainage of moisture from inside.

K. Nameplates
Each motor shall have a stainless steel nameplate with the following minimum information:
1. Manufacturer’s Type designation
2. Frame Number
3. Output Horsepower Rating
4. Duty (time rating)
5. Rated load speed (RPM)
6. Temperature rise in degrees centigrade at rated load for rotor and stator
7. Stator Voltage Rating
8. Rotor Open Circuit Voltage (wound rotor)
9. Stator Full Load Amperes
10. Rotor Full Load Amperes (wound rotor)
11. Service Factor (marked for operation at 40 C ambient)
12. Frequency
13. Number of Phases
14. Inrush of Locked Rotor kVA
15. Code Letter Designation
16. Efficiency
17. Bearing type, size, lubricant

L. Space Heaters
All motors above 50 hp rated shall be supplied with 120 volt, single-phase space heaters to maintain a motor temperature of approximately 10 degrees C above a 40 degrees C ambient.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Motors shall be mounted in accordance with the motor manufacturer’s drawings and instructions. Field installation of the unit shall include final alignment.

Installation shall also include furnishing necessary oil and grease for initial operation and making final adjustments to place the equipment in operable condition.
3.02 FIELD TESTS

A. The motors and their driven equipment shall be tested together after installation.

B. Carry out electrical testing as specified herein and in Section ELECTRICAL TESTING.

3.03 PAINTING

A. Motors shall be shipped to the site with manufacturer’s standard finishes.

END OF SECTION
PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required for a complete electrical system at Lift Station #9 in the Town of Davie, Florida, as hereinafter specified and shown on the Drawings.

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 which will require wiring thereto and/or complete installation is indicated. All materials necessary for the complete installation shall be furnished and installed by the CONTRACTOR to provide complete power, instrumentation, wiring and control systems as indicated on the Drawings and/or as specified herein.

C. The CONTRACTOR shall furnish and install the necessary cables, protective devices, conductors, supports, raceways, exterior electrical system, etc., to serve, motor loads and miscellaneous electrical loads as indicated on the Drawings and/or as specified. The CONTRACTOR shall install any control panel or instrumentation/control device provided under this or any other sections on the specifications.

D. 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.

E. For process instrumentation furnish and install all conduit, wire and interconnections between primary elements, transmitters, local indicators and receivers.

F. Each bidder or his authorized representatives shall, before preparing his proposal, visit all areas of the existing building and structures in which work under this Section is to be performed and inspect carefully the present installation. The submission of the proposal by this bidder shall be considered evidence that he or his representative has visited the buildings 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.

G. All power interruptions to existing equipment shall be at the OWNER's convenience. Each interruption shall have prior approval.

H. 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.
I. Furnish and install a complete underground system of ducts and/or handholes as herein specified and shown on the drawings.

1.02 SERVICE AND METERING

A. Permanent electrical power will be provided by the Florida Power & Light Company (FPL) at voltages indicated on the drawings. The CONTRACTOR shall coordinate all interface requirements directly with FPL.

B. The CONTRACTOR shall pay all fees associated with FPL providing the electrical services.

C. The FPL contact is Erik Delforn, @ (954) 442-6324.

1.03 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, laws and ordinances.

B. Pay all fees required for permits and inspections.

1.04 TESTS

A. Test all systems and repair or replace all defective work. Make all necessary adjustments to the systems and instruct OWNER’s personnel in the proper operation of the systems.

B. The following minimum tests and checks shall be made prior to the energizing of electrical equipment. Test shall be by the CONTRACTOR and a certified test report shall be submitted providing all test results and stating that the equipment meets and operates in accordance with the Manufacturer’s and job specifications, and that equipment and installation conforms to all applicable Standards and Specifications:

1. Testing of protective relays for calibration and proper operation.

2. Test all 600 volt wire insulation with a megohm meter after installation. Make tests at not less than 1000 volts. Submit a written test report of the results to the engineer.

3. Testing of the grounding system with a 3-point tester.

4. Mechanical inspection of all circuit breakers to assure proper operation.

C. The Engineer shall be notified forty-eight (48) hours before tests are made to enable the Owner to have designated personnel present.

1.05 CUTTING AND PATCHING

A. All cutting and patching shall be done in a thoroughly workmanlike manner.
1.06 INTERPRETATION OF DRAWINGS

A. The Drawings are not intended to show exact locations of conduit runs.

B. All three-phase circuits shall be run in separate conduits unless otherwise shown on the Drawings.

C. Unless otherwise approved by the Engineer, conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.

D. Where circuits are shown as "home-runs," all necessary fittings and boxes shall be provided for a complete raceway installation.

E. The CONTRACTOR shall harmonize the work of the different trades so that interferences between conduits, piping, equipment, architectural and structural work will be avoided. All necessary offsets shall be furnished so as to take up a minimum space and all such offsets, fittings, etc., required to accomplish this shall be furnished and installed by the CONTRACTOR without additional expense to the Owner. In case interference develops, the Owner’s authorized representative is to decide which equipment, piping, etc., must be relocated, regardless of which was installed first.

F. Verify with the Engineer the exact locations and mounting heights of receptacles prior to installation.

G. The locations of equipment, outlets, and similar 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.

H. Surface mounted panel boxes, junction boxes, conduit, etc., shall be supported by spacers to provide a clearance between wall and equipment.

I. 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, and other electrical systems shown. Additional circuits shall be installed wherever needed to conform to the specific requirements of the equipment.

J. The ratings of motors and other electrically operated devices together with the size shown for their branch circuit conductors and conduits are approximate only and are indicative of the probable power requirements insofar as they can be determined in advance of the purchase of the equipment.

1.07 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 reproducible "As-built" drawings for the Project Record Documents.
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 SHOP DRAWINGS

A. As specified under other Sections, shop drawings shall be submitted for approval for all materials, equipment, apparatus, and other items as required by the Engineer.

B. Shop drawings shall be submitted for the following equipment:
   1. Pump control panel
   2. Remote Telemetry Unit (RTU)
   3. Generator power inlet box
   4. Lightning Arrestor and Surge Arrestor
   5. Service Rack
   6. Meter Can
   7. Wire & Cable
   8. Conduit
   9. Fused Safety Disconnect Switch
   10. Grounding System (grounds rods, ground rod clamps or cadweld, grounding conductors)
   11. Miscellaneous Electrical Items (including photocell, j-boxes, EYS fittings, duct-seal)

C. The Manufacturer's name and product designation and catalog cut sheets shall be submitted for the following material:
   1. Conduit & Wire
   2. Receptacles
   3. Boxes and fittings
   4. Switches
   5. Lamps
   6. Control relays
   7. Starter
   8. Circuit breakers

D. Prior to submittal by the CONTRACTOR, all shop drawings shall be checked for accuracy and contract requirements. Shop drawings shall bear the date checked and shall be accompanied by a statement that the shop drawings have been examined for conformity to Specifications and Drawings. This statement shall also list all discrepancies with the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.

E. The Engineer's check shall be only for conformance with the design concept of the project and compliance with the Specifications and Drawings. The responsibility of, or the necessity of, furnishing materials and workmanship required by the Specifications and Drawings which may not be indicated on the shop drawings is included under the work of this Section.
F. The responsibility for all dimensions to be confirmed and correlated at the job site and for coordination of this work with the work of all other trades is also included under the work of this Section.

G. No material shall be ordered or shop work started until the Engineer’s approval of shop drawings has been given.

1.10 DISPOSITION OF REMOVED MATERIALS AND EQUIPMENT

A. In general, it is intended that all materials and equipment indicated to be removed and disposed of by the CONTRACTOR, upon removal, become the CONTRACTOR’s property and shall be disposed of off the site by the CONTRACTOR, unless otherwise directed by the OWNER or unless otherwise noted on the drawings.

B. Reuse of wire will not be permitted, except service conductors after Megger testing.

C. All reusable and salvageable disconnect switches, starters, control devices, control panels and instruments, etc. shall be sorted and returned to the OWNER, unless otherwise noted on the drawings.

D. All electrical equipment to be salvaged shall be removed and shall be moved by the CONTRACTOR to a location on the site for storage as directed by the OWNER.

1.11 WARRANTY

A. Provide a warranty for all the electrical equipment in accordance with the requirements of other Sections. Under no circumstances shall the warranty be for less than one year starting from substantial completion.

PART 2 - PRODUCTS

2.01 GENERAL

A. The materials used in all systems shall be new, unused 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 and conform with applicable standards of NEMA and ANSI.

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 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.
2.02 RACEWAYS AND FITTINGS

A. Conduit type shall match its listed and approved applications. PVC SCH 40 shall be used for underground applications and PVC SCH 80 shall be used for exposed / above ground applications unless otherwise specified on the drawings.

B. Conduit fitting material and coating shall match corresponding conduit specification.

C. Duct-seal compound shall be applied to all conduit ends and pull-string shall be installed in any vacant conduits.

2.03 CONDUCTORS

A. Conductors shall be copper with THWN insulation rated for 600 Volts. Conductors shall be color coded in accordance with the NEC.

B. All motor controls, remote indicating lights, alarm circuits and metering loops shall be wired with 14 AWG stranded copper conductors. Insulation shall be polyethylene with an overall PVC jacket for multi-conductor cables.

C. All shielded instrumentation cable shall be 2/c 16 AWG shielded with 600 Volts insulation and PVC outer jacket.

2.04 LIGHTNING/SURGE PROTECTION

A. General - Additional lightning/surge protection shall be provided to protect all telemetering systems from included propagating along the signal and power supply lines. The protection systems shall be such that the protective level shall not interfere with normal operation, but shall be lower than the instrument surge withstand level, and be maintenance-free and self-restoring. Instrument transmitters shall be housed in a suitable metallic case, and properly grounded. Ground wires for all surge protectors shall be connected to a good earth ground and, where practical, each ground wire shall be run individually and insulated from each other. These protectors and specified instrumentation/transmitters shall be mounted in the RTU enclosure. The protector units shall be EDCO SLAC or approved equal.

2.05 DISCONNECT SWITCHES

A. Fusible disconnect switches shall be heavy-duty, NEMA type H, quick-make, visible blades, 240 Volts, 3-pole with full cover interlock. All current carrying parts shall be copper. Where disconnect switches are called for on the Drawings, the CONTRACTOR shall provide a 240 Volts, 3-pole, fusible switch in a NEMA 4X, 316 grade stainless steel enclosure with copper lugs.

1. Non-Fuseable Switches shall be horsepower rated as manufactured by Square D, NEMA-7
2.06 PUMP PANEL (PP)

A. Construction:

1. The electrical control equipment shall be mounted within a NEMA Type 4X, dead front enclosure with 3-point latch, constructed of not less than 14-gauge, 316 grade stainless steel. The control panel shall be UL rated/listed and shall comply with Article 409 of the National Electrical Code. The enclosure shall be equipped with a door and shall incorporate a removable back panel on which control components shall be mounted. Back panel shall be secured to enclosure with collar studs. Aluminum sunshields shall be provided on all sides and top of the enclosures along with forced ventilation and a filtered air vent to reduce internal panel temperatures.

B. Components:

1. Main Breaker: The panel shall include circuit breaker sized as required for main power disconnect. Breaker shall be mounted on the subpanel with handles through inner door. Circuit breaker ampacity, voltage and interrupting capacity shall be listed on the Drawings. Main and motor breakers shall be 25,000 amps AIC, Square D Company or approved equal.

2. An electronic motor circuit protector, H-Frame as manufactured by Square D Company shall be furnished for the pump motor. Thermal-magnetic Type KA circuit breakers shall be furnished for the main breaker. Circuit breaker shall be adjustable. Circuit breaker shall be adequately sized to meet the pump motor and station operating conditions. Ground fault relay shall be provided for each pump.

3. A mechanical disconnect mechanism shall be installed on each circuit breaker to provide a means of disconnecting power to the pump motor.

4. Control relays shall be plug-in type with contacts rated at 300 VAC, 10 amperes, non-inductive. Time delay relays shall be electric type.

5. A NEMA rated, Direct-On-Line (DOL) / Across-the-line motor starter, as manufactured by the Square D Company shall be furnished for each pump motor. Motor starter shall be equipped to provide overload protection on all three (3) phases (Class 20 overloads). Overload reset pushbuttons shall be located on the exterior of the control compartment doors.

6. Provide surge protection as shown on the drawings.

C. Phase Monitor:

1. The monitor shall be a UL recognized component capable of detecting loss of phase, phase reversal, and low voltage on any phase. It shall feature an adjustable voltage range between -15% to +25% of the service voltage, with an adjustable trip delay from 2 to 20 seconds.
2. Reset shall be automatic.

3. 240 Volts monitors shall be eight pin octal type.

D. Boxes and Covers:

1. Boxes and covers shall be bolted together and gasketed.

2. Conduit openings shall be tapped.

3. Doors shall have a vault handle and 3-point catch, interlocked with circuit breaker. Door hinges shall be concealed. Two (2) keys shall be supplied for each lock. All locks shall be keyed alike; directory frame and card having a transparent cover shall be furnished on each door.

4. Covers shall have a keyed switch for acknowledging authorized entry and resetting alarm.

E. Installation:

1. Unless otherwise noted on the Drawings, top of cabinets shall be mounted 6'-6" feet above finished grade, properly aligned and adequately supported independently of the connecting raceways.

2. All wiring in the control panel shall be neatly formed, grouped, and identified to provide a neat and orderly appearance.

3. All nameplates shall be properly secured.

4. All electrical components shall be elevated to a minimum elevation above the 100-year flood plain elevation.

2.07 R.T.U/PLC PANEL

A. Construction:

1. The electrical control equipment shall be mounted within a NEMA Type 4X, dead front enclosure with 3-point latch, constructed of not less than 14-gauge, 316 grade stainless steel. The control panel shall be UL rated/listed and shall comply with Article 409 of the National Electrical Code. The enclosure shall be equipped with a door and shall incorporate a removable back panel on which control components shall be mounted. Back panel shall be secured to enclosure with collar studs. Aluminum sunshields shall be provided on all sides and top of the enclosures along with forced ventilation and a filtered air vent to reduce internal panel temperatures.

B. Operating Controls and Instruments:

1. All operating controls and instruments shall be securely mounted on the control compartment door. All controls and instruments shall be clearly labeled to indicate function.
2. A six (6) digit, non-reset elapsed time meter shall be connected to the motor starter to indicate the total running time of the pump in "hours" and "tenth of hours". The elapsed time meter shall be by Square D Company.

C. Bubbler Liquid Level Control (Lift Station): The liquid level control shall include a pneumatic system for measuring levels in the wet well when used in conjunction with pressure switches. Pressure switches shall be by Allen-Bradley 836-C2 or approved equal. Accurate control of the level in the wet well shall be made by a self-purging bubbler system. Air provided by an industrial air pump shall flow through the bubbler pipes to the bottom of the wet well. Variations in liquid level produce corresponding variations in the air pressure required to maintain bubbling. The rate of bubbling shall be approximately 1½ cubic feet per hour and shall be adjustable from within the controller. Shutoff and bleed valves shall be included to facilitate control adjustments. Furnish bubbler bell at bottom of wet well properly mounted. The following components shall be provided:

1. The industrial air pumps shall operate on 120 VAC and have an adjustable, rheostat to regulate airflow by increasing or decreasing electricity. (Blocking airflow system is not acceptable). The pump shall have replaceable air filters and come complete with rubber feet to guarantee silent operation. The pump shall maintain bubbling with a maximum head of 16.5 feet and backpressure shall not damage the pump. The air pump shall be alternated by a synchronous driven, 24-hour programmable timer with 96 on/off operations per day in 15-minute increments. The output contacts shall be tungsten and rated for 16 amps at 250 VAC.

D. Boxes and Covers:

1. Boxes and covers shall be bolted together and gasketed.
2. Conduit openings shall be capped.
3. Doors shall have a vault handle and 3-point catch, interlocked with circuit breaker. Door hinges shall be concealed. Two (2) keys shall be supplied for each lock. All locks shall be keyed alike; directory frame and card having a transparent cover shall be furnished on each door.
4. Covers shall have a keyed switch for acknowledging authorized entry and

E. System Supplier Qualifications:

1. A minimum of 7 years experience in instrumentation and controls industry.
2. Has done work similar or greater in magnitude to the project at hand.
3. Has an office located in the state of Florida.
4. Must be licensed to do work in Broward County.
5. Must have a service center located in the state of Florida.
F. Pre-approved System Suppliers:
   1. Control Panel shall be manufactured by Commerce Controls, CC Controls, Curry Controls.

G. Installation:
   1. Unless otherwise noted on the Drawings, top of cabinets shall be mounted 6'-6" feet above finished grade, properly aligned and adequately supported independently of the connecting raceways.
   2. All wiring in the control panel shall be neatly formed, grouped, and identified to provide a neat and orderly appearance.
   3. All nameplates shall be properly secured.
   4. All electrical components shall be elevated to a minimum elevation above the 100-year flood plain elevation.

2.08 REMOTE TELEMETRY UNIT (R.T.U)

A. Construction:
   1. The RTU equipment shall be mounted within a NEMA Type 4X, dead front enclosure with 3-point latch, constructed of not less than 14-gauge, 316 grade stainless steel with sun shields. The panel shall be UL rated/listed. The enclosure shall be equipped with a door and shall incorporate a removable back panel on which control components shall be mounted. Back panel shall be secured to enclosure with collar studs.

B. Components:
   1. Main Breaker: The panel shall include circuit breaker sized as required for main power disconnect. Breaker shall be mounted on the subpanel with handle through inner door. Circuit breaker ampacity, voltage and interrupting capacity shall be listed on the Drawings.

C. RTU System
   1. See division 13320 section 2.04 for specifications.

PART 3 - EXECUTION

3.01 CONDUIT INSTALLATION

A. Where conduits enter or leave all outlet boxes, cabinets safety switches, tap boxes, motor controllers, etc., other than those having threaded hubs, a standard lock nut shall be used on the outside of the box. Bushings 1-inch and larger shall be of an approved insulated type. Unless otherwise indicated, conduit 2-inches and larger shall be supported at intervals not exceeding twelve (6) feet and for smaller sizes at intervals not exceeding eight (4) feet.
B. During construction, all installed raceways shall be temporarily plugged or otherwise protected from the entrance of moisture, dirt, trash, plaster, moisture, etc., through neglect of the CONTRACTOR to so protect them, shall be replaced by the CONTRACTOR without additional expense to the Owner. No kinked, clogged or deformed raceways will be permitted on the job. Raceways shall be cut to proper length so that ends will fit accurately in the outlets.

C. Size of raceway shall not be less than NEC requirements, but in no case shall be less than indicated on the Drawings. Combining of circuits, other than detailed, will not be permitted. The CONTRACTOR shall install larger size raceways than detailed where there is excessive length of unbroken run or excessive number of bends.

D. Bends in metallic raceways shall be made while "cold" and in no case shall the raceways be heated. Raceways shall not be bent through more than 90°. The radius of bends shall not be less than six (6) times the internal diameter of the raceway. Not more than four (4) (equivalent 90°) bends will be permitted between outlets, the bends at the outlets being counted.

E. Raceways shall be properly aligned, grouped and supported. Exposed raceways shall be installed at the right angles to or parallel to the principal structural members. Concealed raceways, unless otherwise indicated, may take the most direct route between outlets. Raceways shall be firmly held in place. Raceways shall run to avoid trapping wherever possible. Where areas are indicated for future openings, foundations, etc., all raceways shall be run around such areas. The CONTRACTOR shall provide necessary inserts in poured concrete areas and shall furnish and install all necessary sleeves through walls, floors and roofs for passage of raceways. Sleeves through roofs and/or exterior walls shall be properly sealed by the CONTRACTOR against entrance of moisture, etc., into the building. Where necessary repairs to the building structure are required the CONTRACTOR shall use material in no way inferior to that originally installed.

F. Contractor shall provide 4" high concrete housekeeping pads around all conduits above grade.

3.02 BOXES

A. Install all outlet boxes, tap, junction or pull boxes, device boxes, etc., necessary for the complete installation as indicated on the Drawing and/or specified herein. All boxes shall be rigidly mounted and shall be equipped with suitable screw fastened covers. Where necessary for boxes to be supported away from the ceiling, structural steel members shall be provided for supports. All raceways entering boxes shall be mechanically and electrically secure. Open knockouts or holes in boxes shall be plugged with suitable blanking devices. Boxes shall be cleared of all plaster, dirt, trash, etc., before the installation of any wiring devices and/or before the installation of cover plates.
3.03 CONDUCTORS

A. Splices, taps and attachments of fittings and lugs shall be electrically and mechanically secure. Approved solderless lugs and connectors shall be used for all conductors with 2-bolt type being used for sized No. 4/0 AWG and larger. There shall be plenty of slack cable in boxes, outlets and cabinets to insure that there is no binding at the bushings. All lugs shall be of the correct sizes for the conductor in order to fit the conductor into a lug.

B. All splices shall be compression type and submersible rated as manufactured by Greaves (Black-Bury), NSI Industries (Polaris Blue), or Thomas & Betts (HOMAC).

C. Ungrounded phase wires of a delta connected 120/240 volt, 3-phase, 4-wire system, black, orange (high leg), and blue.

3.04 GROUNDING

A. The entire electrical system shall be completely and effectively grounded as required by the NEC and as specified hereinafter.

B. All metallic raceways shall be mechanically and electrically secure at all joints and at all boxes, cabinets, fittings and equipment. Metallic raceways entering the motor control center control panels or other electrical boxes shall be grounded to the appropriate ground bus. All metallic raceways shall be electrically continuous throughout the entire conduit system. Bond wires shall be used in exterior concrete pull boxes.

C. The grounding electrodes shall consist of a minimum of two (2) 3/4" x 10' copper ground rods spaced at least 6' apart. The Grounding Electrode Conductor (GEC) shall be connected to the ground rods by an approved CADWELD or ground rod clamp. The GEC shall be connected to the grounded service conductor (via main bonding jumper) as required by the drawing/NEC at the main disconnect switch. The ground resistance of the grounding electrodes shall be tested and additional rods added to achieve a dry season resistance not exceeding 5 ohms. Provide certification of ground resistance reading (as per 3-point test method).

3.05 SUPPORTS

A. The CONTRACTOR shall furnish and install all necessary supports for properly mounting all electrical equipment and raceways. Such supports shall be fabricated and installed in a neat and workmanlike manner, and care shall be taken that at no time shall any portion of the building structure be overloaded. Should the building structure sustain damage through carelessness or through failure of the CONTRACTOR to properly support and install the electrical equipment, the CONTRACTOR shall bear all costs involved in repairing or replacing such installation.

B. All steel shapes exposed to the weather shall be galvanized after all cutting, drilling, and/or welding is done. All shop connections shall be welded or riveted and all field connections shall be bolted on all outdoor structures. Where the field cutting or drilling of galvanized steel is necessary, the CONTRACTOR shall apply one (1) coat of priming paint and one (1) finish coat of aluminum and oil paint.
3.06 TESTS AND CHECKS

A. The following minimum tests and checks shall be made after the assembly of the electrical system rack, but prior to the termination of any field wiring.

1. Megger terminals and buses after disconnecting devices sensitive to megger voltage.

2. A 1,000V DC megger shall be used for these tests.

3. The first test shall be made with main circuit breaker closed and all remaining breakers open. A second test shall be made with all circuit breakers closed.

4. The test results shall be recorded and forwarded to the Engineer for his review. Minimum megger readings shall be 100 mega-ohms in both tests.

5. Three-point test for the grounding system

B. The following shall be done before energizing any control panel.

1. Remove all current transformer shunts after completing the secondary circuit.

2. Install overload relay heaters based on actual motor nameplate current. If capacitors are installed between starter and motor, use overload relay heaters based on measured motor current.

3. Check all mechanical interlocks for proper operation.

4. Vacuum clean all interior equipment.

END OF SECTION