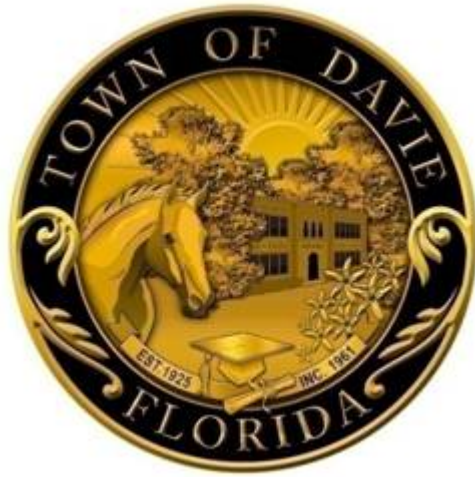


TOWN OF DAVIE



SW 48th Court Water Main

SPECIFICATIONS

Prepared by:



Calvin, Giordano & Associates, Inc.
EXCEPTIONAL SOLUTIONS™

August 2016

CGA Project No. 96-1630.101

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TOWN OF DAVIE, FLORIDA

TOWN OFFICIALS

6591 Orange Drive, Davie, Florida 33024 Tel: 954-327-3742 Fax: 954-327-3752

Mayor	Judy Paul
Vice Mayor	Marlon Luis
Council Member	Caryl Hattan
Council Member	Bryan Caletka
Council Member	Susan Starkey
Town Administrator	Richard J. Lemack
Town Attorney	John Rayson
Procurement Manager	Brian K. O'Connor
Utilities Director	Don Bayler

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SW 48th Ct. Water Main

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DOCUMENT 00010

NOTICE TO BIDDERS

The Town of Davie is accepting sealed bids until 2:00 p.m. on December 1, 2016 for the following:

SW 48th Ct. Water Main

BID NUMBER B-17-07

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 Bid, (a) Bidder should provide evidence that he or she is licensed as a General Contractor to perform the work and services, (b) evidence that he or she has successfully performed projects of similar scope and size with 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.

Upon a nonrefundable payment of **\$100.00** payable by cashier's check, money order or cash, the plans and specifications may be purchased from 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 are not available.

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

Companies which 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 in the Council Chambers at Davie Town Hall, 6591 Orange Drive, Davie, FL 33314 on November 10, 2016 at 2:00 p.m. A site visit shall immediately follow the pre-bid conference to allow access at the treatment plant site and facilities where construction is to be taken place. Meeting location will be determined at pre-bid conference.

Sealed bid envelopes containing three copies of the bid (one (1) clearly marked "original" and 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 December 1, 2016 to the Purchasing Division, 6591 Orange Drive, Davie, Florida, 33314. Bids will be opened on or about 2:00 p.m., December, 1, 2016, 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, FL

Brian K. O'Connor
Procurement Manager

SUPPLEMENT TO: NOTICE TO BIDDERS

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

TOWN OF DAVIE

SW 48th Ct. Water Main

BID NUMBER B-17-07

The Contractor shall provide a unit price bid for all work, all required permits from governmental agencies having jurisdiction in the Town of Davie, such as the Town Building and Engineering Departments, Broward County and equipment items, tools, materials, electricity and test water for completion of the SW 48th Ct. Water Main , and Tie-in to existing Water Main.

The Contractor shall be responsible for all sound level violations and reported complaints for same associated with bypass pumping and construction work. Actual field sound levels generated shall be in accordance with sound levels as governed by the Town of Davie and Broward County Ordinances whichever is more stringent. The Contractor shall respond to all reported sound and odor complaints. The Contractor shall be responsible for clean up and deodorization of any releases to the air, ground or surfaces water bodies – directly or indirectly. All clean up costs, fines, legal fees or any other unfavorable occurrences that result in damage to the Town or its reputation for same-shall be borne by the contractor.

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

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DOCUMENT 00100

INSTRUCTIONS TO BIDDERS

1. SUBMITTAL

- 1.1 Sealed Bids will be received until the time and date specified in the Notice for Bids.
- 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: **SW 48th Ct. Water Main**

Bid No. **B-17-07**

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 Notice for Bids. 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, 00400, 00450, and 00650. 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 and with all blanks filled in.
- 2.3 Vendors shall return a completed W-9 form, completed Vendor/Bidder Disclosure form and E-Verify form with their bid.

3. IRREGULAR BIDS

- 3.1 Bids which are incomplete, conditional or 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 Bids, 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.
- 5.2 On all Drawings, the figured dimensions shall govern in cases of discrepancies between the scales and figures. The Contractor shall take no advantage of any error or omission in the Drawings or any discrepancy between the Drawings and Specifications. The Town of Davie and acting as Engineer of Record Calvin, Giordano & Associates shall make such interpretations as may be deemed necessary for the fulfillment of the intent of the Drawings and Specifications.

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 Contract 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.
- 6.4 Each Bidder shall be responsible for investigating the groundwater conditions at the site prior to submitting his or her Bid. The Bidder shall base Bid on his or her own investigation and shall assume all risk of any variances in groundwater conditions.
- 6.5 Each Bidder shall verify any available soil (core) borings, at structure sites, by undertaking his or her own soil borings as needed. Neither Owner nor Engineer will assume responsibility for varying sub-soil quality of conditions incurred during the work. The Bidder shall certify he or she has made all necessary sub-soil investigations and is satisfied the Bid adequately covers the anticipated soil conditions. No soil borings shall be taken without prior approval from the Town of Davie.

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

- 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 seven (7) 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 Article 7 as indicated in the Bid Form. Refer to Document 00300.
- 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 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 Forms (Document 00300 and Document 00450) with Bid.

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 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 Consulting Engineers shall serve as agent for the Owner, the Town of Davie, 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. 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 the names of the subcontractors proposed 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 such 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 and Calvin Giordano and Associates 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 Base 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 Town of Davie 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, it may be canceled upon written notification.

31. LIQUIDATED DAMAGES:

31.1 The Town shall assess a one thousand (\$1,000) 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) signed and sealed, and a CD with the electronic CAD drawings in State Plane Coordinates NAD 83, 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

- 36.1 All work shall comply fully with the Florida Building Code, Latest Edition, The Town of Davie’s “Land Development Code,” The Town of Davie’s “WATER AND SEWER UTILITIES STANDARDS – MARCH 2007 REVISION and all other applicable Federal, State and County Codes, Regulations, Statutes, Ordinances, and Referenced Standards.

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DOCUMENT 00300

BID FORM

TOWN OF DAVIE

SW 48th Ct. Water Main

SUBMITTED: _____
Date

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-17-07**.
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 **90 calendar days**. If not, liquidated damages will be assessed at the rate of one thousand dollars (\$1,000.00) 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.

BIDDER _____
ADDRESS _____

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)

BIDDER

ADDRESS

(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
TOWN OF DAVIE SW 48TH WATER MAIN
Bid No. B-17-07

Bid Item	Description	Estimated Quantity	Unit	Unit Price
1	Mobilization/Demobilization/Erosion Control Not to Exceed 5% of Total Bid	1	LS	\$
2	Maintenance of Traffic	1	LS	\$
3	Furnish and Install 6" Water Main complete for furnishing, installation and operation, including all labor, equipment and materials necessary for final product. Including, but not limited to all excavation, piping, fittings, tie-ins, valves, fire hydrants, backfilling, compaction, testing, restoration, hauling and disposal, as indicated on plans and specifications.	1	LS	\$
4	Engineering Department Fees (10% of Bid Price)	1	LS	\$
Total Contract Amount				\$

TOTAL CONTRACT AMOUNT IN WORDS

The lowest Bid shall be determined by the Total Contract Amount

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 Document 00800, 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

SW 48th Ct. Water Main

QUALIFICATION REQUESTS

Contractor to list projects fulfilling the following qualification requests:

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

1. Projects involving Water Main Installations.
2. List Project Management Personnel, include resumes. Personnel cannot be changed without written approval.
 - * Principal in charge
 - * Project Manager
 - * Superintendent
3. List three (3) previous public Bid projects in Broward County. List Owner's representative and phone number.
4. Failure to have successfully completed previous public Bid projects may disqualify Bidder.

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

PROJECT LIST

Completed Construction Projects that satisfy qualification requirements:

<u>Project Name</u>	<u>Owner or Representative</u>	<u>Phone Number</u>	<u>Engineer</u>	<u>Contract Amount</u>	<u>Date Completed</u>
1.					
2.					
3.					
4.					
5.					
6.					
7.					



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):

Full Legal Name

Address

By: _____ Date: _____

Signature of Affiant

Print Name

SUBSCRIBED AND SWORN TO or affirmed before me this _____ day of _____, 2016, 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

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 Davie 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.

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.
8. Emergency purchases.
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: _____



**SOLID WASTE CONSTRUCTION AND DEMOLITION
DEBRIS COLLECTION AND DISPOSAL
REQUIREMENTS FOR BIDDING JOBS IN THE TOWN
OF DAVIE**

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 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 or brian_oconnor@davie-fl.gov.

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 OF DAVIE'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 \$1,000/DAY FOR FIRST VIOLATIONS, UP TO \$5,000/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 (preferably 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 and two (2) copies 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: _____



**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: _____



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.

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 member 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.

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.

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.

Once the bid protest is resolved, the Town will proceed with the bid award, except as exempted in 2, above.

**Request for Taxpayer
 Identification Number and Certification**

**Give Form to the
 requester. Do not
 send to the IRS.**

Print or type See Specific Instructions on page 2.	Name (as shown on your income tax return)	
	Business name/disregarded entity name, if different from above	
	Check appropriate box for federal tax classification (required): <input type="checkbox"/> Individual/sole proprietor <input type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____ <input type="checkbox"/> Exempt payee <input type="checkbox"/> Other (see instructions) ▶ _____	
	Address (number, street, and apt. or suite no.)	Requester's name and address (optional)
	City, state, and ZIP code	
List account number(s) here (optional)		

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number											
				-			-				
Employer identification number											
				-							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here	Signature of U.S. person ▶	Date ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

DOCUMENT 00400

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:

SW 48th Ct. Water Main

All work, tools, equipment and materials required for the SW 48th Ct. Water Main shall be provided by the Contractor.

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

SURETY

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature and Title

By: _____
Signature and Title

Attest: _____
Signature and Title

(Attach Power of Attorney)
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.

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DOCUMENT 00450

TRENCH SAFETY AND QUALIFICATION 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

Bidder Signature

Witness Printed Name

Bidder Printed Name

Witness Address

Title

Date

Date

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 two projects successfully performed for a public entity.

A. Project Name: _____ Owner: _____
 Project Address: _____
 Contact: _____ Phone: _____
 Contract Amount: _____ Date of Completion: _____
 Description of Work: _____

B. 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.)

NAME OF PROJECT	OWNER	TOTAL CONTRACT VALUE	CONTRACTED DATE OF COMPLETION	PERCENTAGE COMPLETION TO DATE
-----------------	-------	----------------------	-------------------------------	-------------------------------

(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

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.)

NAME OF PROJECT	OWNER	TOTAL CONTRACT VALUE	CONTRACTED DATE OF COMPLETION	PERCENTAGE COMPLETION TO DATE
------------------------	--------------	-----------------------------	--------------------------------------	--------------------------------------

(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

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DOCUMENT 00500
AGREEMENT

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 SW 48th Ct. Water Main 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 90 days 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 one thousand dollars (\$1,000.00) 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. It is further mutually agreed between the parties hereto that if, at any time after the execution of the Agreement and the Surety Bond hereto attached for its faithful performance and payment, the Owner shall deem the Surety or Sureties upon such Bond to be unsatisfactory or if, for any reason, such Bond ceases to be adequate to cover the performance of the work, the Contractor shall replace the Surety at its expense, within five (5) days after the receipt of notice from such form and amount and with such Surety or Sureties as shall be satisfactory from the Owner. In such event, no further payment to the Contractor shall be deemed to be due under this Agreement until such new or additional security for the faithful performance of the work shall be furnished in a manner and form satisfactory to the Owner.
9. No additional work or extras shall be performed unless the same shall be duly authorized by appropriate action of the Owner in writing.
10. That in the event either party brings suit for enforcement of disagreement, the prevailing party shall be entitled to 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 immediately 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.
11. 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.
12. The Contractor shall perform all work required by the Contract Documents for the SW 48th Ct. Water Main, **Bid No. B-17-07**.
13. 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.

CONTRACTOR

WITNESS:

BY

TITLE

DATE: _____

OWNER

Town of Davie, Florida
Municipal Corporation

ATTEST:

Evelyn Roig
Town Clerk

JUDY PAUL
Mayor

(Seal)

Richard J. Lemack
Town Administrator

APPROVED AS TO FORM AND
CORRECTNESS:

DATE: _____

John Rayson
Town Attorney, Town of Davie

Council Approved: _____
Date

Contract Amount: \$ _____

END OF DOCUMENT

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DOCUMENT 00600

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):

SW 48TH COURT WATER MAIN

BID NO. B-17-07

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: _____
Name and Title:

Signature: _____
Name and Title:

CONTRACTOR AS PRINCIPAL

Company (Corporate Seal)

Company (Corporate Seal)

Signature: _____
Name and Title

Signature: _____
Name and Title

_____ 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. With respect to the Owner, this obligation shall be null and void if the Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2 Defends, indemnifies and holds harmless the Owner from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.
3. With respect to 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 here from, 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.

END OF DOCUMENT

DOCUMENT 00601

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)

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):

SW 48TH COURT WATER MAIN

BID NO. B-17-07

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: _____

Name and Title:

Signature: _____

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. 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:
 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
 2. Deny liability in whole or in part and notify the Owner citing reasons therefor.

5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen (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.

END OF DOCUMENT

DOCUMENT 00650

ACKNOWLEDGEMENT OF CONFORMANCE
WITH O.S.H.A. STANDARDS

TO THE TOWN OF DAVIE:

We, _____ hereby acknowledge and agree that as Contractors for the SW 48th Ct. Water Main , within the limits of the Town of Davie, 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

ATTEST

By: _____

Title: _____

Date: _____

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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

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

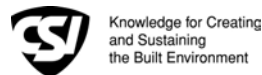
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The Associated General Contractors of America



Construction Specifications Institute

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American Council of Engineering Companies
1015 15th Street, N.W., Washington, DC 20005

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400

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.

16. *Cost of the Work*--See Paragraph 11.01.A for definition.

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

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

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

20. *Field Order*--A written order issued by Engineer which requires minor changes in the Work but

which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*--Sections of Division 1 of the Specifications. 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 other 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. 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 adaptation 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 included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual’s or entity’s own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, 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 - 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.

a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

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

5.06 *Property Insurance*

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

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, 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) 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,

Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. 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 there from 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 of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

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

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

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or 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, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made 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, as to Shop Drawings and Samples, see Paragraph 6.17.

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

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

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

9.07 *Determinations for Unit Price Work*

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

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

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work 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

Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

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, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

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

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

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A 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 subcontracts 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, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefore as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored

elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim 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

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

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

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

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

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph

15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

15.03 *Owner May Terminate For Convenience*

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

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

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

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

4. reasonable expenses directly attributable to termination.

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

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

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

Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

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

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

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

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

3. gives written notice to the other party of 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.

DOCUMENT 00800

SUPPLEMENTAL 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.
4. The General Conditions of the Conditions of the Contract for Construction.
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 fourteen (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.

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, Inc.
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 guying and shoring, by tying down loose materials, equipment and construction sheds. Hurricane plan shall be submitted for approval.

PUBLIC RECORDS REQUEST: Per Florida Statutes F.S. 119.07(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. 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.”

END OF DOCUMENT

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DOCUMENT 00900

PERMITTING

1. The building plans will be reviewed by the Town of Davie 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, Broward County Environmental Protection Department, Broward County Health Department, Broward County HRS, Central Broward Drainage District, etc.
2. Approved FDOT MOT plan.
3. Dewatering permit and fees are the responsibility of Contractor.

END OF DOCUMENT

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SECTION 01010
SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Contractor use of site
- B. Location of Work
- C. Description of Work
- D. Owner Occupancy
- E. Work by Others

1.02 CONTRACTOR USE OF SITE

- A. Limit use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Work by others and Owner.

1.03 LOCATION OF WORK

- A. The work is located along Davie Road within the Town of Davie, Florida, easement.

1.04 DESCRIPTION OF CONTRACT

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. Piping
 - 1. Construct an approximate total of 700 LF of 6" PVC Water Main.
 - 2. Construct Two (2) New Fire Hydrant Assemblies.
 - 3. Pressure/Leak test new force main.
 - 4. Restore sidewalks and pavement.
 - 5. Restore right of way as required to original or better condition.
 - 6. Inspection and testing.

1.05 WORK SEQUENCE

- A. Water main and all appurtenances to be tested and placed in service per Contractor's approved construction schedule.

1.06 OWNER OCCUPANCY

- A. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.
- B. Schedule the Work to accommodate this requirement.

1.07 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 01015

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

- A. General provisions of Contract, including General and Supplementary Conditions.
- B. Requirements for determining completed Work - Section 01025.

1.02 PROJECT DESCRIPTION

- A. The work shall generally consist of: Constructing a new 10" DIP Water Main to existing 10" DIP Water Main within easement.

1.03 CONTRACTOR USE OF PREMISES

- A. Contractor shall have full use of the premises for construction operations, including use of the site. The Contractor's use of the premises is limited only by 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 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.
- E. Do not dispose of organic and hazardous material on site, either by burial or by burning.

1.04 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.
- B. Environmental Performance: In order to secure approval to proceed with construction, the Owner may be committed to comply with terms of an Environmental Impact Statement. A copy of this Statement shall be transmitted to the Contractor prior to execution of the Owner-Contractor Agreement. The Project

has been designed and the Contract Documents prepared with the intention that resulting Work will comply with terms of that Statement.

1. Before Substantial Completion inspect, test and adjust performance of every system or facility of the Work to ensure satisfactory overall performance
2. No later than 30 days after Owner occupancy and use of the Project, return and again inspect, test and adjust the Work. Measure lift station performance to demonstrate record compliance.
3. Submit a report of results to the Owner.
4. Instruct the Owner's operating personnel on operational requirements needed to maintain compliance.
5. Report performance of completed installations after adjustments that appear unable to comply with the requirements.

1.05 SUBMITTALS

- A. General: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
- B. Progress Schedule: Fully developed, horizontal bar chart type Contractor's construction schedule. Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue updated schedules monthly.
- C. Daily Construction Report: Record of construction activities and events at the site; submit two (2) copies to the Engineer at weekly intervals.
- D. Shop Drawings: Newly prepared information, drawn to accurate scale. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.
 1. Shop Drawings shall include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings.
 2. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- E. Product Data: Collect into a single submittal for each element of construction or system. Includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves.
- F. Samples: Full size, fully fabricated samples cured and finished as specified and physically identical with the material or product proposed.
- G. Submit shop drawings/product data for the following Work:
 1. Pipe Certifications
 2. Ductile Iron Pipe and Fittings
 3. HDPE Pipe
 4. Valves and Appurtenances

1.06 QUALITY CONTROL

- A. The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity.
 - 1. Costs for these services shall be included in the Contract Sum.
- B. The Contractor is responsible for and shall pay costs of retesting when required by Engineer or Owner and of additional testing needed or required by the Contractor.
- C. 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.

1.07 MATERIAL AND EQUIPMENT

- A. Substitutions: After Bidding period, up to 30 days after date of Notice to Proceed, the Engineer will consider written requests from Contractor for proposed substitutions of products. Subsequent requests will be considered only in case of product unavailability or other condition beyond control of the Contractor. Submit a separate request for each proposed substitution; 2 copy each on the Substitution Request (SR) available from the Engineer.
 - 1. Do not order or install substitute products without written acceptance from the Engineer of Record.
 - 2. Do not imply or indicate substitutions on shop drawings or product data submittals without a separate formal request.
 - 3. Engineer will determine acceptability of substitution.
 - 4. Only one request for substitution for each product will be considered. If not accepted, Contractor shall provide specified product.
- 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.
 - 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.

1.08 RECORD DOCUMENTS

- A. Record construction information and changes on a set of Contract Drawings and Project Manual, verified and annotated by an independent Land Surveyor registered in the State of Florida.

- B. Keep Record Documents current with construction progress and do not conceal any Work until required information is recorded. Legibly mark to record actual construction:
 - 1. Horizontal and vertical control location of underground utility piping, cables and lines referenced to permanent surface improvements.
 - 2. Location of miscellaneous components, secondary systems and accessories.
 - 3. Elevations of surface improvements and depths of underground elements of construction.
 - 4. Location and extent of interface with services and existing adjacent elements.
 - 5. Manufacturer, trade name and catalogue number of each product and item actually provided.
- C. Label each document PROJECT RECORD in 2 inch printed letters followed by the Contractor's name and address and the signature of the Contractor's authorized representative. No Record Documents will be accepted from Subcontractors.
- D. Submit completed Record Documents to the Engineer prior to or in conjunction with request for Substantial Completion. Prior to final payment, revise Record Documents to show additional information, construction and changes and resubmit to the Engineer.

1.09 TESTING

- A. The Contractor shall obtain the services of a professional testing laboratory approved by the Engineer to perform the following type of tests and test frequencies. Copies of all reports are to be sent to the Engineer as soon as possible.
- B. Density tests for trench backfill at the rate of three (3) tests per lift in 1,000 feet of trench.
- C. Density tests for subgrade compaction at the rate of three (3) tests in 1,000 feet of roadway.
- D. Density tests for limerock base at the rate of three (3) tests per day on each course of completed compacted base.
- E. Density tests for roadway crossings at the rate of one test per lane per lift of compacted material, beginning one foot above the normal water table.
- F. If in the opinion of the Engineer, suitable compaction has not been achieved around structures, density tests may be required.
- G. Concrete compressive strength at the rate of three (3) cylinders per the lesser of 50 cubic yards or per day.
- H. Should the above test results indicate deficiencies, the Engineer may order additional tests at the Contractor's expense, and all reworked areas shall be retested at the Contractor's expense.

- I. Testing in the County right-of-way shall meet the requirements of the Florida Department of Transportation.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

- A. General provisions of Contract, including General and Supplementary Conditions.
- B. Other Division-1 Specification Sections.

1.02 SECTION INCLUDES

- A. Administrative and procedural requirements for determining Work completed under unit price contract.

1.03 GENERAL REQUIREMENTS

- A. Unit prices shall include the providing of all costs required for the complete construction of the specified unit of work including cost of materials and delivery; cost of installation labor, including social security, insurance, and other required fringe benefits, workman's compensation insurance; bond premiums; rental of equipment and machinery; taxes; testing; surveys and other incidental expenses; and supervision.
- B. 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.
- C. Contract Sum adjustments will be by Change Order on basis of net accumulative change for each unit price category.
 - 1. Except as otherwise specified, unit prices shall apply to both deductive and additive variations of quantities.
 - 2. Unit prices in the Agreement shall remain in effect until date of final completion of the entire Work.
- D. Partial payment for material and equipment properly stored and protected will be made in accordance with requirements of the General Conditions.
- E. Payment will be made at the respective contract unit and lump sum price for each item shown in the Agreement, installed and accepted, which price and payment shall constitute full compensation for furnishing all materials and performing all Work in connection therewith and incidental thereto.
 - 1. No separate payment will be made for:
 - a. Clearing and Grubbing
 - b. Record Drawings
 - c. Construction of haul roads as may be required.
- F. Unit Price Abbreviations:

1. Lineal Feet - LF
2. Acre - AC
3. Cubic Yard - CY
4. Each - EA
5. Lump Sum - LS
6. Square Foot - SF

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 MEASUREMENT

1. Services:
 - A. Payment for furnishing and installing the PVC pipe will be made at the lump sum price as stated in the proposal.
 - B. Payment for furnishing and installing the air release valve manholes will be made at the unit price per EA stated in the proposal.
2. Restoration: Payment for concrete and asphaltic cement pavement restoration will be made at the unit price per LS stated in the Proposal.
3. Project Mobilization
 - A. The Project Mobilization item shall be administered in accordance with the Florida Department of Transportation, Standard Specifications for Road & Bridge Construction (latest edition); MOBILIZATION.
 - B. The maximum amount allowed for the mobilization item shall be five percent (5) percent of the total contract amount.
 - C. Mobilization includes, but is not limited to, mobilization of equipment, all surveying, all supervision, cost of all bonds and warranties, video graphic costs, all permit fees not listed in proposal, and all insurance.

3.02 PROTECTION

- A. Where pavement, trees, shrubbery, fences or other property or surface 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. The pavement restoration item may only be used upon approval of the Engineer.

END OF SECTION

SECTION 01030

SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.01 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 that may or may not be shown on the Drawings. The Contractor is responsible for obtaining utility locations from the utility owners or utility locate 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. It is the Contractor's responsibility to locate all utilities or other subsurface obstructions that may interfere with the work.

1.02 PROVISIONS FOR THE CONTROL OF DUST

- A. Sufficient precautions shall be taken during construction to minimize the amount of dust created. Wetting down the site may be required or as directed by the Engineer to prevent dust as a result of vehicular traffic.

1.03 SALVAGE

- A. Any existing equipment or material, including but not limited to, valves, 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 excavated, if necessary, and delivered to the Owner to 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 the Contractors expense and to a suitable location.

1.04 MAINTENANCE OF EXISTING WATER AND WASTEWATER FACILITIES OPERATION

- A. The Contractor shall take notice that existing water and wastewater collections and transmission lines and drainage facilities are 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 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. All existing utilities shall be pothole located prior to construction of conflicting piping.

1.05 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 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 Owner or Engineer this procedure is not feasible he 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.
- B. Utility lines and structures indicated on the Drawings which are to remain in service shall be protected by the Contractor from any damage as a result of his operations. Where utility lines or structures not shown on the Drawings are encountered, the Contractor shall report them to the Owner before proceeding with the work. The Contractor shall bear the cost of repairs or replacement of any utility lines or structures which are broken or damaged by the Contractor's operation.

1.06 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 for the actual connection of the existing mains shall be included in the bid price for the pipe installation and shall not result in any additional cost to the Owner.

1.07 RELOCATIONS

- A. The Contractor shall be responsible for the relocation of structures, including but not limited to light poles, signs, sign poles, fences, piping, irrigation 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.

1.08 WARRANTIES

- A. All equipment supplied under these Specifications shall be warranted by the Contractor and the equipment manufacturers for a period of one (1) year, unless otherwise specified. Warranty period shall commence on the date of Owner acceptance.
- B. The equipment shall be warranted to be free from defects in workmanship, design and materials. If any part of the equipment should fail during the warranty period, it shall be replaced and restored to service at no expense to the Owner. In the event of Contractor's failure to perform warranty work promptly, the Owner reserves the right to perform the work, and the Contractor shall be liable to the Owner for the cost thereof.

- C. The manufacturer's warranty period shall run concurrently with the Contractor's warranty or guarantee period. No exception to this provision shall be allowed. The Contractor shall be responsible for obtaining equipment warranties in accordance with Section 01740 from each of the respective suppliers or manufacturers for all the equipment specified under Division 15.
- D. In the event that the manufacturer 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 at the job site.
- E. All warranties and bonds shall be submitted prior to the issuance of final payment.

1.09 HURRICANE PREPAREDNESS PLAN

- A. 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 which 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.
- B. 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 have been damaged or injured by reason of failure on the part of Contractor or any Subcontractor to protect the Work, such Work and materials shall be removed and replaced at the expense of the Contractor.

1.10 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 and the Owner received specified days of inspection or testing.
- B. The cost for the additional days required shall not be added to the cost of the Owner, but shall be to the account of the Contractor.

1.11 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 and the time it will take to perform the work.

1.12 RIGHTS-OF-WAY

- A. The Contractor shall not do any work that would affect any gas, sewer, or water pipeline; any telephone, cable 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 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, amount, 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, except as provided for temporary suspension of the work in the General Conditions of the Contract.

1.13 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 at the Contractor's expense after all street or roadway resurfacing has been completed.

1.14 PERMITS

- A. The Contractor shall obtain the permits required by the state, county or Town agencies. Permit fees will be paid by the Contractor.

1.15 MAINTENANCE OF TRAFFIC (DAVIE ROAD – FDOT APPROVED MOT)

- A. The Contractor shall at all times conduct his work so as to assure the least possible obstruction to traffic and inconvenience to the general public, and provide adequate protection of persons and property in the vicinity of the work.
- B. When the normal flow of traffic will be impaired or disrupted in any manner on any street, the Contractor shall notify the police at least 48 hours in advance.
- C. Street shall not be closed, except when and where directed by the Engineer, and whenever a street is not closed, the work must be conducted with the provision for safe passageway for traffic at all times. The Contractor shall make all necessary arrangements concerning maintenance of traffic and selection of detours required.

- D. When permission has been granted to close an existing roadway, or portion thereof, the Contractor shall furnish and erect signs, barricades, lights, flags and other protective devices as necessary subject to the approval of the Engineer. From sunset to sunrise, the Contractor shall furnish and maintain as many yellow lights as the Engineer may direct.
- E. During working hours, the Contractor shall furnish watchmen in sufficient numbers to protect and divert the vehicular and pedestrian traffic from working areas closed to traffic, or to protect any new work. Failure to comply with this requirement will result in the Engineer shutting down the work until the Contractor shall have provided the necessary protection.
- F. No separate payment will be made for such signs, barricades, lights, flags, watchmen or other protective devices as required, with all costs thereof deemed to be included in the prices bid for the various items scheduled in the bid.
- G. The contractor shall submit and obtain approval for a Maintenance of Traffic (MOT) plan from FDOT and copies sent to the Engineer of Record.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

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SECTION 01045

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- 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 REQUIREMENTS

- A. Section 01010: Summary of Work
- B. Section 15062: Ductile Iron Pipe and Fittings
- 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

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SECTION 01050

FIELD ENGINEERING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide and pay for field engineering services required for Project as follows:
 - 1. Land Surveying work required to lay out the work and for execution of the structures.
 - 2. Civil, structural or other professional engineering services specified, or required to execute the Contractor's construction methods.
- B. The Contractor shall retain the services of a registered land surveyor licensed in the State of Florida to identify existing control points and property line corner stakes indicated on the Drawings, as required. Verify all existing structure locations and all proposed building corner locations, tank locations and equipment locations. Provide as-built location and elevation of pipes, valves, and connectors.

1.02 RELATED WORK

- A. Section 01720: Project Record Documents.

1.03 QUALIFICATIONS OF PROFESSIONAL

- A. Qualified Registered Land Surveyor, acceptable to the Owner and the Engineer.
- B. Registered professional engineer of the specialty required for the specific service on the Project, currently licensed in the State of Florida.

1.04 SURVEY REFERENCE POINTS

- A. Horizontal and vertical control points for the Project are to be established by 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 approval from the Engineer of Record.
 - 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.

1.05 PROJECT SURVEY REQUIREMENTS

- A. Establish a minimum of two temporary benchmarks 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. Stakes for grading, fill and topsoil placement.
 - b. Utility slopes, top of pipe and invert elevations.
 - c. Structure top and invert elevations.
- C. From time to time, verify layouts by same methods.

1.06 PROJECT RECORD DOCUMENTS

- A. The contractor shall maintain accurate and complete records of all work items completed.
- B. All “as-built” information submitted to the engineer of record shall be sufficiently accurate, clear and legible to ‘satisfy the engineer of record that the information provided a true representation of the improvements constructed’.
- C. Upon completion of construction, the contractor shall submit to the engineer of record one complete set of “as-built” construction drawings. These drawings shall be marked to show “as-built” construction changes and dimensioned locations and elevations of all improvements and shall be signed by the contractor.
- D. All “as-built” information on elevations of sanitary sewage, paving, drainage and utility easement shall be certified by a registered surveyor and mapper.
- E. “As-built” information on the utility system shall include, but is not limited to locations of all valves, fittings, fire hydrants, water and sewer services, tap and end, any pipe deflections and top-of-pipe elevation on 100-foot intervals at a minimum.
- F. Prior to a final inspection by the Town of Davie, the contractor shall submit two (2) sets of blueprints of “as-built” construction drawings
- G. Upon a final inspection by the Town of Davie, the contractor shall submit to the town (2) complete set of reproducible mylars and (3) sets of blueprints of “as-built” construction drawings that have been certified by a registered surveyor and mapper and the engineer of record. Two (2) certified virus free labeled cd’s containing an electronic drawing file in auto-cad 2000 format or an equivalent dxf file shall be submitted to the Town of Davie engineering department. The electronic drawings will be to scale and set in state plane coordinate system, NAD 83 (feet). The drawings shall include coordinate data located with (gps) or other system where ties are made to the original coordinate data.

1.07 SUBMITTALS

- A. Submit name and address of registered land surveyor 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 drawings showing locations of all structures constructed. This drawing shall be included with the project record documents

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01090

REFERENCES

PART 1 - GENERAL

1.01 GENERAL

- 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 SFBC shall mean the South Florida Building Code, Broward Edition. 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 Specifications:** The CONTRACTOR shall construct the WORK specified herein in accordance with the requirements of the Contract Documents and the referenced portion of those referenced codes, standards, and specifications listed

herein; except, that wherever references to "Standard Specifications" are made, the provisions therein for measurement and payment shall not apply.

- 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 TRADE NAMES AND ALTERNATIVES

- 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 Supplement to Bid Form, shall supersede any language contained hereinafter.
- B. Whenever in the Contract Documents the name or the name and address of the manufacturer or distributor is given for a product or other material, or if any other source of a product or material is indicated therefore, such information is given for the convenience of the CONTRACTOR only, and no limit, restriction, or direction is indicated or intended thereby, nor is the accuracy or reliability of such information guaranteed. It shall be the responsibility of the CONTRACTOR to determine the accurate identity and location of any such manufacturer, distributor, or other source of any product or material called for in the Contract Documents.
- C. 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.
- D. 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.

1.04 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.

1.05 ABBREVIATIONS AND ACRONYMS

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
AREA	American Railway Engineering Association
ASA	Acoustical Society of America
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers

ASQC	American Society for Quality Control
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BBC	Basic Building Code, Building Officials and Code Administrators International
BHMA	Builders Hardware Manufacturers Association
CBM	Certified Ballast Manufacturers
CEMA	Conveyors Equipment Manufacturers Association
CGA	Compressed Gas Association
CLPCA	California Lathing and Plastering Contractors Association
CLFMI	Chain Link Fence Manufacturers Institute
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DCDMA	Diamond Core Drill Manufacturers Association
DIPRA	Ductile Iron Pipe Research Association
EIA	Electronic Industries Association
ETL	Electrical Test Laboratories
HI	Hydraulic Institute
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IME	Institute of Makers of Explosives
IP	Institute of Petroleum (London)
IPC	Institute of Printed Circuits
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
MBMA	Metal Building Manufacturers Association
MPTA	Mechanical Power Transmission Association
MTI	Marine Testing Institute
NAAM	National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards
NCCLS	National Committee for Clinical Laboratory Standards
NEC	National Electric Code
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
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National 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
WCRCI	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)

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SECTION 01152

APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

1.02 RELATED REQUIREMENTS

- A. Agreement between Owner and Contractor consisting of an approved payment schedule by the Town Finance Director.
- B. Conditions of the Contract: Progress Payments, Retainages, Final Payment, Schedule of Values and Record Documents.
- C. Section 01050: Field Engineering
- D. Section 01310: Construction Schedules
- E. Section 01370: Schedule of Values
- F. Section 01380: Construction Photographs
- G. Section 01720: Project Record Documents

1.03 FORMAT AND DATA REQUIRED

- A. Submit applications typed on forms provided by the 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.

1.04 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.

- a. List by Change Order Number, and description, as for an original component item or work.

1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:
 - 1. Project
 - 2. Application number and date
 - 3. Detailed list of enclosures
 - 4. For stored products:
 - a. Item number and identification as shown on application.
 - b. Description of specific material.
- B. Submit one copy of data cover letter for each copy of application.
- C. As a prerequisite for payment, Contractor is to submit a "Surety Acknowledgment of Payment Request" letter showing amount of progress payment which the Contractor is requesting.
- D. The Contractor shall maintain an updated set of drawings to be used as record drawings in accordance with Section 01720. As a prerequisite for monthly progress payments, the Contractor shall submit the updated record drawings for review by the Engineer per Section 01050.
- E. Construction schedule in accordance with 01310

1.06 PREPARATION OF APPLICATION FOR FINAL PAYMENT

- A. Fill in Application form as specified for progress payments.
- B. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.
- C. Submit final record drawings.

1.07 SUBMITTAL PROCEDURE

- A. Submit Applications for Payment to the Engineer at the times stipulated in the Agreement.
- B. Number: Five copies of each Application.
- C. When the Engineer finds Application properly completed and correct, he will transmit certificate of payment to Owner, with copy to Contractor.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Engineer shall schedule and administer preconstruction meetings, periodic progress meetings, and specially called meetings throughout the progress of work. The Engineer shall:
 - 1. Prepare agenda for meetings.
 - 2. Make physical arrangements for meetings.
 - 3. Preside at meetings.
 - 4. Record the minutes; include significant proceedings and decisions.
 - 5. 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 contractors, 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 ascertain that work is executed consistent with Contract Documents and construction schedules.

1.02 RELATED REQUIREMENTS

- A. Document 00100: Instructions to Bidders.
- B. Section 01310: Construction Schedules.
- C. Section 01340: Shop Drawings, Working Drawings, and Samples.
- D. Section 01720: Project Record Documents.

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.
 - 6. Major Suppliers.

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.
6. Adequacy of Distribution of Contract Documents.
7. Procedures for maintaining Record Documents.
8. Use of Premises:
 - a. Office, Work and Storage Areas.
 - b. Owner's Requirements.
9. Construction facilities, controls and construction aids.
10. Temporary Utilities.

1.04 PROGRESS MEETINGS

- A. Schedule regular periodic meetings. The progress meetings will be held as required by progress of the work.
- B. Hold called meetings as required by progress of the work.
- C. Location of the meetings: Project field office of the Contractor 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.
 11. Maintenance of quality standards.
 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)

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SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- 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 REQUIREMENTS

- A. Document 00700: Conditions of the 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

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 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
 4. Subcontractors
 5. Other Concerned Parties
- 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

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SECTION 01340

SHOP DRAWINGS, WORKING DRAWINGS AND SAMPLES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- 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).
 - 4. Status of Submittal (Approved/Resubmit/Rejected).
 - 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.
 - 9. Status of O & M submittal.

1.02 RELATED REQUIREMENTS

- A. Document 00700: Standard General Conditions of the Construction Contract
- B. Section 01720: Project Record Documents
- C. Section 01730: Operating and Maintenance Data
- 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.

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. 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.
- E. The Contractor shall submit to the Engineer all drawings and schedules sufficiently in advance of construction requirements to provide no more than twenty-one (21) calendar days for checking and appropriate action from the time the Engineer receives them.
- F. 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.
- G. 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.

1.04 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 per subparagraph (1.05.C), and 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 a submittal/resubmittal a maximum of three (3) times 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.

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.
 6. Specification title and number.
- 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 one (1) year.
- 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

DOCUMENT 01370

SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- 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. Upon request of the Engineer, support the values with data which will substantiate their correctness.
- C. The Schedule of Values shall be used as the basis for the Contractor's Applications for Payment.

1.02 RELATED REQUIREMENTS

- A. Document 00700: Conditions of the Contract
- B. Section 01152: Application for Payment

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. Type 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.
- 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.
- E. Schedules are subject to Engineer's approval wherein additional line item detail may be required.

PART 2 – PRODUCTS (Not Used)

PART 3 – PRODUCTS (Not Used)

END OF SECTION

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DOCUMENT 01380

CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Employ competent photographer to take construction record photographs for preconstruction conditions, periodically during course of Work, and post-construction.

1.02 RELATED REQUIREMENTS

- A. Section 01152: Application for Payment
- B. Section 01720: Project Record Documents

1.03 PHOTOGRAPHY REQUIRED

- A. Provide photographs taken on cutoff date for **each** scheduled Application for Payment.
- B. View and Quantities Required:
 - 1. Take a minimum of 24 exposures of the site and adjacent property at preconstruction, monthly, and post-construction.
 - 2. Aerial photography shall be acceptable.
- C. Negatives:
 - 1. Remain property of photographer
 - 2. Require that photographer maintain negatives for a period of two years from Date of Completion of entire project.
 - 3. Photographer shall agree to furnish additional prints to Owner and the Engineer at commercial rates applicable at time of purchase.

1.04 COSTS OF PHOTOGRAPHER

- A. Contractor shall pay costs for specified photography and prints.
 - 1. Parties requiring additional photography or prints will pay photographer directly.

PART 2 - PRODUCTS

2.01 PRINTS

A. Color:

1. Paper: Single weight, color print paper
2. Finish: Smooth surface, glossy
3. Size: 8 inch x 10 inch

B. Identify each print on back, listing:

1. Name of Project
2. Orientation of View
3. Date and time of exposure
4. Name and address of photographer
5. Photographer's numbered identification of exposure.

PART 3 - EXECUTION

3.01 TECHNIQUE

A. Factual presentation

B. Correct exposure and focus

1. High resolution and sharpness
2. Maximum depth-of-field
3. Minimum distortion

3.02 VIEWS REQUIRED

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

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

3.03 DELIVERY OF PRINTS

A. Deliver 3 sets of prints to the Engineer to accompany each Application for payment.

END OF SECTION

SECTION 01385

COLOR AUDIO-VIDEO CONSTRUCTION RECORD

PART 1 - GENERAL

1.01 SCOPE

- A. Prior to the commencement of any work, including CONTRACTOR mobilization, the CONTRACTOR shall have a continuous color digital audio-video DVD recording taken along the entire length and width of the proposed project route to serve as a record of preconstruction conditions. The CD/DVD recording shall be suitable for viewing on standard laptop and/or desk top computers used by the TOWN. Two copies of the CD/DVD recording shall be kept at the site, one with the TOWN and one with the CONTRACTOR until completion of the work.

1.02 CONSTRUCTION SCHEDULE

- A. Digital recordings shall not be made more than 30 days prior to construction in any area. No construction shall begin prior to review and approval of the digital recordings, covering the construction area, by the TOWN. The CONTRACTOR shall reschedule unacceptable coverage within five (5) days after being notified. All master CD/DVD's and written records shall be well maintained without any damage and shall become the property of the TOWN.

1.03 PROFESSIONAL VIDEO-GRAPHERS

- A. The CONTRACTOR shall engage the services of a professional video-grapher. The color audio-video digital recordings shall be prepared by a responsible commercial firm known to be skilled and regularly engaged in the business of pre-construction color audio-video digital documentation. The video-grapher shall furnish to the CONTRACTOR for submittal to the TOWN a list of all equipment to be used for the audio-video recording, i.e., manufacturer's name, model number, technical specifications and other pertinent information. Additional information to be furnished by the video-grapher shall include the names and addresses of two (2) references that the video-grapher has performed color audio-videotaping for on projects of a similar nature, including one (1) within the last twelve (12) months.

PART 2 - PRODUCT

2.01 GENERAL

- A. The total audio-video digital recording system and the procedures employed in its use shall be such as to produce a finished product that will fulfill the technical requirements of the project. The video portion of the recording shall produce bright, sharp, and clear pictures with accurate colors and shall be free from distortion or any other form of picture imperfection. All video recordings shall, by electronic means, display on the screen the day, the time, the month, and the year of the recording. This date and time information must be continuously and simultaneously generated with the actual recording. The audio

portion of the recording shall produce the commentary of the camera operator with proper volume, clarity, and be free from distortion.

2.02 EQUIPMENT

- A. Audio/Video Recorder: Digital voice and video recorder, MPEG-4 recording technology for TV quality video recording, built-in microphone for high quality voice and sound recording, 3.15 Mega Pixel CDD Sensor with up to 640x480 video resolution, 4X digital zoom, 16MB internal memory, SD/MMC compatible, compatible with software needed and cabling provided to interface with a Windows XP based computer for creating high quality CD/DVD file records.
- B. Video CD/DVDs: Used to create and store digital video, audio and multimedia files. Stores up to 4.7GB or more than two hours of MPEG2 Video, compatible for playback with most DVD players and DVD-ROM drives on Windows XP based computers. The DVDs shall be new and shall not have been used for any previous recording.

PART 3 - EXECUTION

3.01 COVERAGE

- A. The recordings shall contain coverage of all surface features located within the construction areas and shall include but not be limited to: all roadways, pavements, detention ponds, ditches, walls, piping, equipment, curbs, driveways, sidewalks, culverts, headwalls, retaining walls, buildings, landscaping, trees, shrubbery, fences, and electrical power poles and equipment. Of particular concern shall be the existence of any faults, fractures, or defects.
- B. Recording coverage shall be grouped by street that will be affected by the work. Coverage shall include all surface conditions located within the zone of influence of construction supported by appropriate audio description.

3.02 AUDIO CONTENT

- A. Accompanying the video recording shall be a corresponding and simultaneously recorded audio recording. This audio recording, exclusively containing the commentary of the camera operator, shall assist in viewer orientation and in any needed identification, differentiation, clarification, or objective description of the features being shown in the video portion of the recording including the location relative to construction activities planned. The audio recording shall be free from any conversations between the camera operator and any other production technicians. Panning, zoom-in and zoom-out rates shall be sufficiently controlled to maintain a clear view of all subjects.

3.03 VIDEO CD/DVD LABELING

- A. Video CD/DVD Identification: All CD/DVD's for the digital video recordings shall be permanently labeled using commercial CD labeling software and labels. CD/DVD's shall be properly identified by disc number, project title, and date recorded.
- B. Video CD/DVD Logs: Each video recording digital file shall have a log of that video recording's contents and what CD/DVD the recording file is stored on. The log shall describe the various segments of coverage contained on that video recording in terms of the location within the plant, extent of coverage, beginning and end points, directions of coverage, and date.

3.04 TIME OF EXECUTION

- A. Visibility: All recording shall be performed during times of good visibility. No recording shall be done during periods of significant precipitation, mist, or fog. The recording shall only be done when sufficient sunlight is present for outdoor recordings to properly illuminate the subject, and to produce bright, sharp video recordings of those subjects. For indoor recordings, the CONTRACTOR shall provide adequate lighting to produce bright, sharp video recordings. No recording shall be performed when more than 10% of the area to be recorded contains debris or obstructions unless otherwise authorized by the TOWN.

3.05 CONTINUITY OF COVERAGE

- A. In order to increase the continuity of the coverage, the coverage shall consist of a single, continuous, unedited recording which begins at one end of a particular construction area and proceeds uninterrupted to the other end of that area. Coverage shall reflect an organized, interrelated sequence of recordings from one construction area to another.

3.06 COVERAGE RATES

- A. The rate of travel during a particular segment of coverage shall be related to the amount of the surface features within a construction area being recorded. Average rate of travel shall not exceed sixty feet per minute from approximately 10 feet from subject.

3.07 CAMERA OPERATION

- A. Camera Stability: Camera shall be firmly held such that movement of the camera during the recording process does not cause an unsteady picture.
- B. Camera Control: Camera pan, tilt, zoom-in, and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during video playback. In addition, all other camera and recording system controls such as lens focus and aperture, video level, pedestal, chroma, white balance, and electrical focus shall be properly controlled or adjusted to maximize picture quality.

- C. Viewer Orientation Techniques: The audio and video portions of the recording shall maintain viewer orientation. To this end overall establishing views and visual displays of all visible building distinguishing characteristics shall be incorporated at the beginning of each recording. The narrator shall regularly call out changes in direction, viewing angle, focus zoom, and distinguishing subjects as the video recording progresses.
- D. Operator Experience: The operator in charge must have had previous experience with audio-video documenting preconstruction work. Any apprentice operator(s) must be continuously supervised by an experienced operator.

3.07 DVD VIEWING

- A. The CD/DVD recordings shall be suitable for playing and video and audible recordings on standard computer desktop or laptop computers as well as conventional DVD players.

END OF SECTION

SECTION 01410

TESTING AND TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Contractor shall employ and pay for the services of an Independent Testing Laboratory to perform testing as required by the Owner to verify conformity with the Contract Documents.
 - 1. Contractor shall cooperate with the laboratory to facilitate the execution of its required services.
 - 2. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract.

1.02 RELATED REQUIREMENTS

- A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
- B. Respective sections of specifications: Certification of products.
- C. Each specification section listed: Laboratory tests required and standards for testing.
- D. Testing laboratory inspection, sampling and testing is required for, but not limited to the following:
 - 1. Section 02200: Earthwork
 - 2. Section 15065: PVC Water Main Pipe

1.03 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

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

1.04 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel, and provide access to Work and pay for testing.
- B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.

- D. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. 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.
- E. Furnish incidental labor and facilities:
1. To provide access to Work to be tested
 2. To obtain and handle samples at the Project site or at the source of the product to be tested
 3. To facilitate inspections and tests
 4. For storage and curing of test samples
- F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
- G. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01505

CONTROL OF WORK

PART 1 - GENERAL

1.01 QUALITY OF WORK

- 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 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.

1.03 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 Town.
- 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 a 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.

1.04 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 as 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.

1.05 SITE CLEANLINESS

- A. Dust Abatement - 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. 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.
- B. Rubbish Control - During the progress of the work, the Contractor shall keep the site of the work and other areas used by it in a neat and clean condition, and 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. 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. Sanitation
 - 1. 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.
 - 2. 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.

1.06 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 Town.

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.

END OF SECTION

SECTION 01520

MAINTENANCE OF UTILITY OPERATIONS DURING CONSTRUCTION

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. The existing sewer collection/transmission system will be maintained in continuous operation by the Town during the entire construction period of the Contract as hereinafter specified. The intent of this Section is to outline the minimum requirements necessary to provide continuous service and operation throughout the construction period.
- B. Work under the Contract shall be scheduled and conducted by the Contractor so as not to impede any process, reduce the performance of any lift station or cause any disruption in service to existing customers except as explicitly permitted hereinafter. In performing the Work shown and specified, the Contractor shall plan and schedule its Work to meet the system operating requirements, and the constraints and construction requirements as outlined in this Section.
- C. Work not specifically covered in the following paragraphs may, in general, be done at any time during the contract period, subject to the operating requirements and constraints and construction requirements outlined hereinafter. All references to days in this Section shall be consecutive calendar days.

1.02 GENERAL CONSTRAINTS

- A. The CONTRACTOR shall schedule the Work so that the sewer collection/transmission system is maintained in continuous operation. All short-term system or partial system shutdowns and/or diversions shall be approved by the Town. Long-term process shutdowns and diversions shall conform to the requirements hereinafter specified. All process interruptions shall be coordinated with the Town and scheduled at times suitable to the Town. Shutdowns shall not begin until all required materials are on hand and ready for installation. If the Contractor completes all required Work before the specified shutdown period has ended, the Town may immediately place the existing system back into service.
- B. The Contractor shall schedule short-term and extended shutdowns in advance and shall present all desired shutdowns in the project schedule. Shutdowns shall be fully coordinated with the Project Manager at least 72 hours before the scheduled shutdown.

- C. Short term or partial shutdowns in plant flow will be allowed for tie-ins to existing facilities, installation of temporary bulkheads, etc. All such shutdowns shall be scheduled during low-flow periods and shall be limited to less than four (4) hours. The Contractor shall provide appropriate diversion facilities to be approved by the Town, if the proposed construction methods require longer shutdowns. The Contractor services allowed outside of normal Work hours (night or weekends) for Work requiring process interruption shall be provided at no additional cost to the Town.
- D. Any temporary Work, facilities, roads, walks, protection of existing structures, piping, blind flanges, valves, equipment, etc. that may be required within the Contractor's Work limits to maintain continuous and dependable system operation shall be furnished at no extra cost to the Town.
- E. The Town shall have the authority to order Work postponed, stopped or prohibited that would, in its opinion, unreasonably result in interrupting the necessary functions of the system operations.
- F. If the Contractor impairs performance or operation of the system as a result of not complying with specified provisions for maintaining system operations, then the Contractor shall immediately make all repairs or replacements and do all Work necessary to restore the system back to operation to the satisfaction of the Town. Such Work shall progress continuously to completion on a 24-hours per day, seven Work days per week basis.
- G. The Contractor shall provide the services of emergency repair crews on call 24-hours per day.

1.03 GENERAL MAINTENANCE OF OPERATIONS REQUIREMENTS

- A. Access to Project Site, Roadways, and Parking Areas
 1. An unobstructed traffic route through the street shall be maintained at all times for the Town's residents, business owners, business patrons, Town's operations personnel and county emergency and sheriff vehicles. Parking for personal vehicles of construction personnel shall only be allowed within designated staging areas approved by the Town. The Contractor shall be responsible for providing access to and for preparing and maintaining/approved parking areas.
 2. An unobstructed traffic route shall be maintained at all times. Vehicular access to individual homes, buildings and lots for Town residents and personnel shall be maintained at all times by the Contractor.
 3. The Contractor shall provide temporary measures to protect the existing pavement by filling over with earthen material or supplying other measures acceptable to the Town, and shall repair any damage to existing paved surfaces that occurs during the construction period. Any areas disturbed along the shoulders of the roads, driveways and elsewhere shall be repaired, graded, seeded, etc. as necessary to match pre-existing conditions.

4. The Contractor shall not undertake the final restoration of new or existing roadway (paved, gravel, or asphalt overlay) damaged by construction activities, until all other Work has been completed. The Contractor shall provide temporary repair to, or detours around, any damaged roadways and driveways to allow un-hindered normal access to all facilities until final repairs are made at the end of construction.
- B. Resident/Business Access: Town Residents and Businesses shall have access at all times throughout the construction period. The Contractor shall locate stored material, dispose of construction debris and trash, provide temporary walkways, provide temporary lighting, and other such Work as required to maintain access to homes and businesses.
- C. Plumbing Facilities: Temporary sanitary facilities for the Contractor's use shall be supplied by the Contractor and shall be periodically pumped out by the Contractor at appropriate intervals.
- D. Draining Process Pipes and Conduits (General): The contents of all pipes and conduits to be removed, replaced or relocated (or dewatered for a specific purpose) shall be transferred to a suitable facility in a manner approved by the Town through hoses or piping, or by using pumps if hydraulic conditions so require them. The Contractor shall provide the pumps, piping and hoses at no additional cost to the Town. No uncontrolled spillage of a pipe or conduit shall be permitted. Any spillage, other than potable water, shall be immediately pumped up and properly disposed of.
- E. Sanitary Sewer System: Sewer service shall be maintained in continuous service at all times during construction except for short term interruptions required for tie-ins. Shutdown of the system shall be fully planned and coordinated with the Town and shall be limited to not more than two (2) hours. Existing lift stations and force mains shall be operational at all times, unless otherwise approved by the Town.
- F. Stormwater Ponds and Drainage: All existing drainage inlets, swales, and drainage culverts shall remain in service throughout the construction period such that no flooding of the existing area occurs. Temporary drainage devices or diversion methods may be employed as approved by the Town during modifications to any drainage systems.

1.04 CONSTRUCTION SEQUENCE AND OPERATIONAL CONSTRAINTS

- A. Work under the Contract shall be scheduled and performed in such a manner as to result in the least possible disruption to the operation of the existing sewer collection/transmission system.
- B. Critical events in the sequence of construction are specified herein. The outline sequence of construction does not include all items necessary to complete the Work, but is intended to identify the sequence of critical events necessary to minimize disruption to the on-going sanitary sewer service for the customers. It shall be understood by the Contractor that the critical events identified are not all inclusive and that additional items of Work not shown may be required. The sequence of construction is a precedence requirement and does not attempt to schedule the Contractor's Work. It is intended only to indicate which activities must precede other activities in order to minimize interferences and disruptions.

1. Mobilization and Preliminary Site Work.
 2. Construct new 20"/24" force main including valves, fittings and appurtenances.
 3. Construct Wet Well
 4. Headworks tie-in
 5. Final Site Work
 6. Project Closeout
- C. The existing facilities shall be maintained in an operable condition by the Contractor during construction (excluded from this requirement are all normal and emergency maintenance functions normally performed by the Town with the Town's staff or by Contract.) All Work by the Contractor that disrupts the normal system operations shall be shown on the Construction Schedule and specifically scheduled with the Town. Schedule notification shall consist of a written notice defining the Work to be accomplished, the normal sewer collection/transmission system function that will be interrupted, the duration of the interruption, and the mitigating effort to be performed by the Contractor. Written notice shall be submitted to the Town 14 days in advance of the proposed Work and the Town will respond to the Contractor in writing within 7 days of receipt of the notice regarding the acceptability of the proposed plan.
- D. At no time shall the Contractor shut down any lift stations, close off any force mains, or open valves, or take any other action which would affect the operation of the existing collection/transmission system without prior written approval by the Town.
- E. Temporary installation/connections and pumping may be used where sufficient time is not available to complete a particular aspect of the Work without interrupting system operations. The Contractor at no additional cost to the Town shall provide any temporary piping and/or valves and pumping that it deems is necessary to construct the new facilities while maintaining existing system operations. All such temporary installations shall be subject to review and acceptance by the Town.

PART 2 – PRODUCTS ((No Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01540

SECURITY

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Security Program
- B. Entry Control
- C. Personnel Identification
- D. Miscellaneous Restrictions

1.02 RELATED SECTIONS

- A. Section 01010 - Summary of Work

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. Become familiar with Owner and Engineer representatives.
- B. Restrict access to job site to these representatives.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01550

SITE ACCESS AND STORAGE

PART 1 - GENERAL

1.01 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.

1.02 TEMPORARY CROSSINGS

- A. General: Continuous, unobstructed, safe, and adequate pedestrian and vehicular access shall be provided to fire hydrants, commercial and industrial establishments, churches, schools, parking lots, service stations, motels, fire and police stations, and hospitals. Safe and adequate public transportation stops and pedestrian crossings at intervals not exceeding 300 feet shall be provided. The Contractor shall cooperate with parties involved in the delivery of mail and removal of trash and garbage so as to maintain existing schedules for such services. Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time.
- B. Temporary Bridges: Wherever necessary, the Contractor shall provide suitable temporary bridges or steel plates over unfilled excavations, except in such cases as the Contractor shall secure the written consent of the individuals or authorities concerned to omit such temporary bridges or steel plates, which written consent shall be delivered to the Engineer prior to excavation. All such bridges or steel plates shall be maintained in service until access is provided across the backfilled excavation. Temporary bridges or steel plates for street and highway crossing shall conform to the requirements of the authority having jurisdiction in each case, and the Contractor shall adopt designs furnished by said authority for such bridges or steel plates, or shall submit designs to said authority for approval, as may be required.
- C. Street Use: Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street, alleyway, or parking area during the performance of the Work hereunder, and he shall so conduct his operations as not to interfere unnecessarily with the authorized Work of utility companies or other agencies in such streets, alleyways, or parking areas. No street shall be closed to the public without first obtaining permission of the Engineer and proper governmental authority. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise indicated. Toe boards shall be provided to retain excavated material if required by the Engineer or the agency having jurisdiction over the street or highway. Fire hydrants on or adjacent to the Work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the Contractor to assure the use of sidewalks and the proper functioning of all gutters, storm drain inlets, and other drainage facilities.

- D. Traffic Control: For the protection of 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). The Contractor shall produce a Maintenance of Traffic Plan and have this plan approved by the Florida Department of Transportation and Town of Davie. 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.

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.

- E. Temporary Street Closure: If closure of any street is required during construction, the Contractor shall apply in writing to the Town Engineer and any other jurisdictional agency at least 30 days in advance of the required closure. A Detour and Traffic Control Plan shall accompany the application.
- F. Temporary Driveway Closure: The Contractor shall notify the Owner or occupant (if not owner-occupied) of the closure of the driveways to be closed more than one eight-hour (8) workday at least three (3) working days prior to the closure. The Contractor shall minimize the inconvenience and minimize the time period that the driveways will be closed. The Contractor shall fully explain to the owner/occupant how long the work will take and when closure is to start.

1.03 CONTRACTOR'S WORK AND STORAGE AREA

- A. The Contractor shall make his own arrangements 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 (Not Used)

END OF SECTION

SECTION 01570

TRAFFIC REGULATION

PART 1 - GENERAL

- 1.01 DESCRIPTION: The Work to be performed under this section shall include furnishing all materials and labor necessary to regulate vehicular and pedestrian traffic.
- 1.02 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS: The Work under this Contract shall be in strict accordance with the following codes and standards.
- A. Local, county and municipal codes.
 - B. Florida Department of Transportation Specifications (DOT)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

- 3.01 TRAFFIC AND VEHICULAR ACCESS:
- A. Emergency Vehicles: No multi-family residence, apartment, commercial building or place of employment shall be without access to emergency vehicles for a period longer than three (3) 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 (2) days in advance of such Work.
 - B. Major Road and Streets: No major roads or streets shall be blocked to traffic without adequate detour facilities for a period of more than 30 minutes or as directed by the governing authority.
 - C. 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.
 - D. Residential Property: Access to residential property shall not be blocked for a period of more than 24 hours.
- 3.02 CONSTRUCTION IN STATE HIGHWAY RIGHT-OF-WAY: Construction within all State highway right-of-way shall be made in full compliance with all requirements and to the satisfaction of the Florida Department of Transportation. All necessary barricades, detours, lights and other protective measures shall be provided for the protection of both pedestrian and vehicular traffic.
- 3.03 CONSTRUCTION IN OTHER THAN STATE HIGHWAY RIGHT-OF-WAY: 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.

END OF SECTION

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SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDE

- A. Material and equipment incorporated into the Work:
 - 1. Conform to applicable specifications and standards.
 - 2. Comply with size, make, type and qualify specified, or as specifically approved in writing by the Engineer.
 - 3. Manufactured and Fabricated Products:
 - 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 (2) 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 REQUIREMENTS

- A. Document 00700: Conditions of the Contract
- B. Section 01010: Summary of Work
- C. Section 01030: Special Project Procedures
- D. Section 01340: Shop Drawings, Working Drawings and Samples
- E. Section 01720: Project Record Documents
- F. Section 01740: Warranties and Bonds

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 1.07 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 consideration and approval before materials are necessary for incorporation in the 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 on 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, 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 and 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 insure that the equipment does not deteriorate from lack of use.
- F. 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.

- G. 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.
- H. Protection After Installation:
 - 1. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations.
- I. 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.
- J. 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 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. Products List:
 - 1. Within 30 days after the effective date of the Agreement, submit to the Engineer a complete list of major products proposed to be used, with the name of the manufacturer and the installing subcontractor.
- B. Contractor's Options:
 - 1. For Products specified only by reference standard, select any product meeting that standard.
 - 2. For Products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications, subject to the base bid procedures outlined under Document 00400 - Supplemental Bid Form.
 - 3. For products specified by naming one or more Products or manufacturers and "or equal", Contractor must submit a request as for substitutions for any Product or manufacturer not specifically named.
- C. Substitutions:
 - 1. For a period of 30 days after the effective date of the Agreement, the Engineer will consider written requests from Contractor for substitution of Products.

2. Submit a separate request for each Product, supported with complete data, with drawings and samples as appropriate, including:
 - a. Comparison of the qualities of the proposed substitution with that specified
 - b. Changes required in other elements of the work because of the substitution
 - c. Effect on the construction schedule
 - d. Cost data comparing the proposed substitution with the Product specified
 - e. Any required license fees or royalties
 - f. Availability of maintenance service, and source of replacement materials
3. The Engineer shall be the judge of the acceptability of the proposed substitution.
4. No substitutions will be considered by the Engineer after 30 days from the Contract Date.

D. Contractor's Representation:

1. A request for a substitution constitutes a representation that Contractor:
 - a. Has investigated the proposed Product and determined that it is equal to or superior in all respects to that specified
 - b. Will provide the same warranties or bonds for the substitution as for the Product specified
 - c. Will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the Work complete in all respects
 - d. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

- E. The Engineer will review requests for substitutions with reasonable promptness, and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

1.08 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.

1.09 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 it is to be stored as specified in Paragraph 1.06 herein upon arrival. 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 insure 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.

1.10 WARRANTY

- A. For all major pieces of equipment, submit a warranty from the equipment manufacturer as specified in Section 01740.

1.11 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.

1.12 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

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SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

- A. General provisions of Contract, including General and Supplementary Conditions.
- B. Warranty and bond submittal.
- C. Closeout submittals, warranties and bonds required for specific products of work.

1.02 SECTION INCLUDES

- A. Administrative and procedural requirements for project closeout.
 - 1. Inspection procedures.
 - 2. Project record document submittal.
 - 3. Final cleaning.

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, reinspection process will be repeated.

1.05 RECORD DOCUMENT SUBMITTALS

- A. Maintain at the site one complete set of record documents; protect from deterioration and loss in a secure, fire-resistive location.

1. Provide access to record documents for the Engineer's reference during normal working hours.
 2. Label each document "PROJECT RECORD" in 2 inch high printed letters.
 3. Do not use for construction purposes.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. 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 Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
 2. Mark new information that was not shown on Contract Drawings or Shop Drawings.
 3. Note related Change Order numbers where applicable.
 4. 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.

The record drawings shall correctly and accurately show all changes from the Contract Documents made during construction and shall reflect surveyed information which shall be verified and certified by an independent Professional Land Surveyor registered in the State of Florida. The drawings shall be neat and legible. Show all elevations and horizontal control of all pipes and structures, as defined below:

- a. Record Drawings Submittal Requirements: Record drawings to be submitted shall consist of:
 - 1) Three sets of signed and sealed sets of prints.
- 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.
- D. Record Product Data: 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.
- G. At Contract closeout, deliver one copy of Record Documents to Engineer for Owner. Accompany submittal with transmittal letter in duplicate containing the following information:
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 (N/A)

PART 3 - EXECUTION

3.01 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 01710

CLEANING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Execute cleaning, during progress of the Work, and at completion of the Work, as required by General Conditions.

1.02 RELATED REQUIREMENTS

- A. Conditions of the Contract.
- B. Each Specification Section: Cleaning for specific Products or work.

1.03 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with 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. Execute periodic cleaning to keep the Work, the site and adjacent properties, free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.
- B. Provide on-site containers for the collection of waste materials, debris and rubbish.
- C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.

3.02 DUST CONTROL

- A. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.
- B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.

3.03 FINAL CLEANING

- A. Employ skilled workmen for final cleaning.
- B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- C. Wash and shine glazing and mirrors.
- D. Polish glossy surfaces to a clear shine.
- E. Ventilating Systems:
 - 1. Clean permanent filters and replace disposable filters if units were operated during construction.
 - 2. Clean ducts, blowers and coils if units were operated without filters during construction.
- F. Broom clean exterior paved surfaces and rake clean other surfaces of the grounds.
- G. Prior to final completion, or Owner occupancy, Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas to verify that the entire work is clean.

END OF SECTION

DOCUMENT 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Maintain at the site for the Owner 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

1.02 RELATED REQUIREMENTS

- A. Section 01340: Shop Drawings, Working Drawings and Samples
- B. Section 01700: Contract Closeout

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents and samples in Contractor's field office apart from documents used for construction.
- B. File documents and samples in accordance with CSI format number system.
- C. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- D. Make documents and samples available at all times for inspection by the Engineer.
- E. 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. Label each document "PROJECT RECORD" in neat large printed letters.
- B. Record information concurrently with construction progress.
- C. Drawings; Legibly mark record actual construction:
 - 1. Depths of various elements of foundation in relation to finish first floor datum.

2. All underground piping with elevations and dimensions. Changes to piping location. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Actual installed pipe material, class, etc.
 3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 4. Field changes of dimensions and details.
 5. Changes made by Field Order or by Change Order.
 6. Details not on original contract drawings.
 7. Equipment and piping relocations.
 8. Building and tank locations.
- D. Specifications and Addenda; legibly mark each Section to record:
1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
 2. Changes made by field order or by Change Order.
- E. Shop Drawings (after final review and approval):
1. One set of record shop drawings for each process equipment, piping, (including casings) electrical system and instrumentation system.
- F. Certified site survey and line elevations, and stationing at increments per Section 01050, by registered surveyor.

1.05 SUBMITTAL

- A. At Close-out, deliver Record Documents to the Engineer for the Owner.
- B. Accompany submittal 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
- C. Submittal of Record Drawings shall be in accordance with Section 01050, 1.06.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- 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 REQUIREMENTS

- A. Section 01030: Special Project Procedures
- B. Section 01340: Shop Drawings, Working Drawings and Samples
- C. Section 01700: Contract Closeout
- D. Section 01720: Project Record Documents
- E. Section 01740: Warranties & Bonds

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:

- 1. Commercial quality three-post (3) binders with durable and cleanable plastic covers.
- 2. Maximum post width: 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 data 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 data 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 (5) 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.
- C. Content, for moisture-protection and weather-exposed products:
 - 1. Manufacturer's data, giving full information on products:
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
 - 2. Instructions for inspection, maintenance and repair.
- D. Additional requirements for maintenance data: Respective sections of Specifications.
- E. Provide complete information for products specified.

1.07 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit five (5) 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
 - 9. Each contractor's coordination drawings
 - 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 (2) 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 (6) 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 1.04(C).

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 checklist presented on the following pages (Table 01730) 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 submittal correct for model/series/configuration originally submitted with shop drawings?
- _____ Is binding correct with assigned color/printing etc.?
(Pertains to final three volumes)
- _____ Is submittal properly indexed?
- _____ Does submittal pertain only to equipment being furnished?
- _____ Is submittal easily understood and instructively arranged?
- _____ Does submittal include start-up, shutdown and trouble-shooting procedures?
- _____ Are sufficient drawings and schematics included to supplement written descriptions?
- _____ Is listing of name plate data for each piece of equipment supplied provided and attached?
- _____ Are all drawings provided printed on paper which 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 area representative information provided, i.e., Name, Address, Telephone Number?
- _____ Are specified spare parts indicated and listed?

The following are points of rejection necessitating resubmittal by Contractor:

END OF SECTION

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SECTION 01740

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Compile specified warranties and bonds, as in Articles 5 and 13 of the General Conditions and Section 01030 of these Specifications.
- 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 REQUIREMENTS

- A. Instructions to Bidders: Bid or Proposal Bonds
- B. Conditions of the Contract: Performance Bond and Payment Bond
- C. Section 01030: Special Project Procedures
- D. Section 01700: Contract Closeout

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 major pieces of 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 (see Section 01030).
- 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

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 RELATED SECTIONS

- A. Section 01010: Summary of Work

1.02 SECTION INCLUDES

- A. Preparation of subgrade for building slabs, walks, and pavements.
- B. Excavation, fill and backfill.

1.03 QUALITY ASSURANCE

- A. Perform excavation Work in compliance with applicable requirements of governing authorities having jurisdiction.

1.04 PROJECT CONDITIONS

- A. Locate existing underground utilities in areas of Work. Provide adequate means of support and protection during earthwork operations.
- B. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of Utility Owner.
- C. Do not interrupt existing utilities serving occupied facilities.
- D. Use of Explosives: If the use of explosives is necessary for the execution of the work the Contractor shall conduct his blasting operations in conformance with these specifications and all applicable state and local codes and regulations.
- E. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. Satisfactory Soil Materials: ASTM D2487 soil classification groups GW, GP, GM, SM, SW and SP.
- B. Unsatisfactory Soil Materials: ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH and PT.

- C. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand.
- D. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 in. sieve and not more than 5 percent passing a No. 4 sieve.
- E. Backfill and Fill Materials: Satisfactory soil materials free of clay, rock or gravel larger than 2 in. in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Excavation is Unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
- B. Unauthorized Excavation: Removal of materials beyond indicated subgrade elevations or dimensions without specific direction. Unauthorized excavation, as well as remedial Work directed by Engineer, shall be at Contractor's expense.
- C. Additional Excavation:
 - 1. When unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Engineer.
 - 2. Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in Work.
- D. Stability of Excavations:
 - 1. Slope sides of excavations to comply with local codes and ordinances having jurisdiction.
 - 2. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
 - 3. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- E. Shoring and Bracing:
 - 1. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction.
 - 2. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
- F. Dewatering:

1. Prevent surface water and subsurface or ground water from flowing into excavations.
 2. Do not allow water to accumulate in excavations.
 3. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
- G. Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
- H. Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide minimum 6 in. clearance on each side of pipe or conduit.
1. Excavate trenches to depth indicated or required for indicated flow lines and invert elevations.
 2. Where rock is encountered, carry excavation 6 in. below scheduled elevation and backfill with a 6 in. layer of crushed stone or gravel prior to installation of pipe.
 3. For pipes or conduit 5 in. or less, excavate to indicated depths. Hand excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
 4. For pipes or conduit 6 in. or larger, tanks and other work indicated to receive subbase, excavate to subbase depth indicated, or, if not otherwise indicated, to 6 in. below bottom of work to be supported.
 5. Except as otherwise indicated, excavate for exterior water-bearing piping so top of piping is minimum 3'-6" below finished grade.
 6. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.
- I. Do not backfill trenches until tests and inspections have been made and backfilling authorized by Engineer.

3.02 COMPACTION

- A. Areas to be compacted shall be moistened and compacted by either rolling, tamping or any other approved method by the Engineer in order to obtain the desired density. The Contractor shall inspect all compacted areas prior to further construction operations to ensure that satisfactory compaction has been obtained. All backfill adjacent to structures and pipes, shall be compacted to a density of not less than 100 percent of the maximum density as determined by AASHTO T-99. Density tests are required, such tests shall be made as directed by the Engineer at the expense of the Contractor. The Contractor shall instruct the testing laboratory to forward copies of all test reports to the Engineer.
- B. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

3.03 BACKFILL AND FILL

- A. Place specified soil material in layers to required subgrade elevations:
 - 1. In excavations, use satisfactory excavated or borrow material.
 - 2. Under grassed areas, use satisfactory excavated or borrow material.
 - 3. Under walks and pavements, use subbase material, or satisfactory excavated or borrow material, or combination of both. Place shoulders along edges of subbase course to prevent lateral movement with satisfactory excavated or borrow material.
 - 4. Under steps, use subbase material.
 - 5. Under building slabs, use drainage fill material.
 - 6. Under piping and conduit, use subbase material where subbase is indicated under piping or conduit; shape to fit bottom 90 degrees of cylinder.

- B. Backfill excavations as promptly as work permits, but not until completion of the following:
 - 1. Acceptance of construction below finish grade including waterproofing and perimeter insulation.
 - 2. Inspection, testing, approval, and recording locations of underground utilities.
 - 3. Removal of shoring and bracing, and backfilling of voids with satisfactory materials.

- C. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

- D. When existing ground surface has a density less than that specified for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.

- E. Place backfill and fill materials in layers of 8 in. loose depth for material compacted by heavy compaction equipment, and 4 in. in loose depth for material compacted by hand operated tampers.

- F. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

- G. Place backfill and fill materials evenly adjacent to structures, without wedging against structures or displacement of piping or conduit. Compaction equipment used within 10 ft. of buried walls and soil supported structures shall not exceed 2000 lbs.

3.04 GRADING

- A. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding and as follows:

1. Finish to within not more than 0.10 ft. above or below required subgrade elevations.
 2. Walks: Shape surface to line, grade and cross-section, with finish surface not more than 0.10 ft. above or below required subgrade elevation.
 3. Pavements: Shape surface to line, grade and cross-section, with finish surface 1/2 in. above or below required subgrade elevation.
- B. Grading Surface of Fill under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to 1/2 in. below required elevation.

3.05 FIELD QUALITY CONTROL

- A. Contractor will engage soil testing and inspection service for quality control testing during earthwork operations.
- B. Allow testing service to inspect and approve subgrades and fill layers before further construction work is performed.
- C. If in opinion of Engineer, based on testing service reports and inspection, subgrade or fills which have been placed below specified density, provide additional compaction and testing at no additional expense to Owner.

3.06 CLEANING AND PROTECTION

- A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Remove excess excavated and waste materials, including unacceptable excavated material, trash and debris, and legally dispose of it off Owner's property.

END OF SECTION

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SECTION 02221

TRENCHING, BEDDING, AND BACKFILL FOR PIPE

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. Section 02200: Earthwork

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 (10) 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 (10) 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 (2) 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 (2) 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 (3) 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.

- 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

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SECTION 02510

WALKWAYS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Furnish all labor, materials and equipment necessary to complete all walkways and related items shown in the drawings and specified herein.

1.02 REFERENCES

- A. All materials and methods of construction shall conform to the requirements of the "Florida Department of Transportation, Standard Specifications for Road and Bridge Construction".

1.03 SUBMITTALS

- A. Submit to the Engineer, as provided in the General Conditions, shop drawings showing dimensions and layouts of sidewalks and reinforcement for concrete work.

1.04 RELATED WORK

- A. Site preparation is specified in Section 02200

PART 2 - PRODUCTS

2.01 MATERIALS

A. Concrete Materials:

1. Concrete for work under this section shall be no less than 3000 psi at 28 days.
2. Reinforcing bars shall be deformed type bars conforming to AASHTO M31 Grade 40 or 60. All reinforcing steel shall be shop fabricated, of size, cross-section and arrangement as described on approved shop drawings.
3. Welded wire fabric shall be as shown on the drawings and shall conform to all requirements of AASHTO M55.
4. Expansion joint material shall be 1/2 inch or 3/4 inch thickness where shown, bituminous type meeting AASHTO spec. M-213-65.
5. Joint sealant shall be hot poured rubber conforming to Fed. Spec. SS-S-164.

B. Base Course Material:

1. Base course material shall be graded aggregate conforming to the FDOT.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Sub-grade shall be thoroughly compacted as specified in Division 2.
- B. Forms shall conform to the shapes, lines and dimensions of the members as called for on the plans and shall be substantial and sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together so as to maintain position and shape.
- C. Finishing:
 - 1. Float concrete until 1/4-inch cement gel is brought to surface; steel trowel until dense surface is obtained.
 - 2. Finish with broom at right angles to alignment of work, then round all exterior edges with 3/4-inch radius after brooming.
- D. Curing:
 - 1. Cover walks with sand, sawdust or shavings and keep wet for three (3) days.
 - 2. Cover walks until final clean-up to prevent damages.
 - 3. Other methods of curing may be used subject to approval of the Engineer prior to implementation.
- E. Concrete walks shall be constructed to lines, widths, grades and thickness as shown on the Drawings, but sloped not less than 1/8-inch per foot in direction of water flow. Concrete shall be placed on thoroughly compacted subgrade, having smooth surface and kept moist until time concrete is placed.
 - 1. Isolation joints shall be installed at all intersections with other walks, at head and bottom of steps, curbs and maximum 12-foot O.C. in runs. Expansion material shall be 1/2-inch thick, but not less than 1/4-inch, by depth of concrete; 3/4-inch thick where abutting curbs and gutters, and at parking bays. Expansion material shall extend from bottom of walk slab to within 1/2-inch of top, to be filled with poured joint filler.
 - 2. Dummy grooves shall be 1/2-inch x 1/2-inch having 1/2-inch aprons.
- F. Local conditions, codes and practices shall govern all drive cuts and aprons.

3.02 CLEANUP

- A. At the completion of the work, Contractor shall clean up all scraps, rubbish and surplus materials caused by this work and haul them away from the site and leave job in a neat, clean and orderly condition.

END OF SECTION

SECTION 02513

ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and place asphaltic 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 under their Specifications for Traffic paint (Sec. 971-12.3 in 1977 Edition), Code T-2.
- 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 manufacturers 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 1" 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 treatment, 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 – GENERAL

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 02221: 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.
- B. Special markings shall be plainly marked on the applicable pipe indicating the weight, proper location of the pipe or fitting in the line by reference to layout drawings and schedules, class of pipe, casting period, manufacturer's mark and year pipe was produced.

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 $\frac{1}{3}$ to $\frac{1}{2}$ 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 manufacturers 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. Ant 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-foot separation.
 - 2. Maintain 10-foot 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.

END OF SECTION

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

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SECTION 03200

CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section specifies furnishing, fabricating and placing reinforcing steel for concrete structures.

1.02 TOLERANCES:

Fabricate reinforcing steel within the tolerances specified in "ACI-315-02 - Details and Detailing of concrete reinforcement, Part".

1.03 SUBMITTALS:

In accordance with the general conditions regarding, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES, submit the following:

A. Shop Drawings and Product Data:

1. Bar lists, placement plans, bending diagrams, support reinforcement spacers, chair and hangers for all reinforcing steel.
2. Show full descriptions, details, dimensions and locations of each item.
3. Detail reinforcing steel in accordance with the applicable requirements of ACI 315.

B. Certificates:

1. Certified copy of mill tests on each heat, showing chemical and physical analysis.
2. Welding certificates as required by AWS D1.4-02.

1.04 PRODUCT DELIVERY AND HANDLING:

- A. Deliver reinforcing steel bars to the fabricator in bundles, limited to one size and length of bar, securely tied and identified with plastic or metal tags in an exposed position identifying the mill, the melt or heat number, and the grade and size of bars. Deliver bars to the job site properly identified in accordance with the accepted shop drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Reinforcing Steel bars: ASTM A615, grade 60, unless otherwise indicated.
- B. Spiral Development: ASTM A82.
- C. Welded Steel Wire Fabric: ASTM A185, gauges, spacing and dimensions as indicated. Use flat sheets only.
- D. Metal Filled Sleeve Coupler:

These couplers shall only be used, if required, with reinforcing without epoxy coating and shall meet the following requirements:

1. Capable of developing 125 percent of the yield strength of adjoining reinforcing bars.
2. Designed to produce complete fusion with 100 percent penetration of joint.
3. Connection produced by a standard exothermic process whereby molten filler metal, contained by a high strength steel sleeve of larger inside diameter than adjoining bars, is introduced into the annular space between the bars and the sleeve as well as between the ends of the bars.
4. Either Cadweld as manufactured by Erico Products, Incorporated, or approved equal.

- E. Mechanical couplers shall be used, if required, with epoxy coated and non-epoxy coated bars and shall be capable of developing not less than 125 percent of the yield strength of adjoining reinforcing bars as approved by the Engineer.

2.02 FABRICATION

- A. General: After bar lists and bending diagrams have been approved; fabricate each unit of reinforcing steel to the type, shape, size, grade and dimensions indicated thereon.
- B. Cutting and Bending: Perform cutting and bending of reinforcing steel bars before shipment to the site. Bend all bars cold and in manner that will not injure the material.

PART 3 - EXECUTION

3.01 PLACING AND FASTENING

- A. Reinforcing steel shall be clean and free of dirt, scale, loose rust, paint, oil, grease and other foreign matter when placed in the Work.
- B. Arrange and place bars shown on the approved bending diagrams and placement plans and within the tolerances specified in ACI 301.
- C. Positively secure reinforcing steel against displacement during placement of concrete.
- D. Wire bars together securely. Use soft, pliable wire, 16-gauge minimum. Tie all intersections, unless otherwise indicated. Turn back wires which project within indicated clearances.
- E. On formwork for concrete surfaces exposed to view in the finished structure, use spacers, which will not reflect in the exposed finish.

3.02 COVER:

Embed all reinforcing steel bars, including stirrups, to a clear depth; measured from the outside of the bar to the surface of the concrete, the clear depth shall be as specified in ACI-318. Unless noted otherwise on contract drawings.

3.03 SUPPORTS AND SPACERS:

- A. Support Reinforcing steel in position by means of approved spacers, chairs or hangers.
- B. Support Reinforcing Steel located in the bottom of slab resting on earth precast concrete mortar blocks, with cast-in tie wires, of the proper size and dimensions to position the steel.

3.04 SPLICING:

- A. Furnish reinforcing steel in full lengths as indicated. Splice bars only where indicated, submit for approval.
- B. Where splices are indicated, use tied lapped splices in accordance with requirements of ACI 318.
- C. Splice welded steel wire fabric in accordance with ACI 318. Also see structural drawings for lap and splice schedule. Securely fasten lapped ends and edges.

END OF SECTION

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SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION:

This Section specifies cast-in-place concrete, including furnishing, placing, curing, protecting and finishing, designing, furnishing, erecting, and removing formwork; constructing expansion and contraction joints and waterstops.

1.02 QUALITY ASSURANCE:

- A. Concrete Quality: Concrete exposed to public view shall be executed to a high degree of quality in forming, color, texture and finish. An organization and/or persons who have had adequate experience in producing high quality concrete shall execute concrete exposed to public view.
1. Adequate experience shall mean that the Contractor and/or his subcontractors and/or their personnel who execute the concrete Work, shall have had at least five (5) years of experience in concrete construction to the high degree of quality in forming, color, texture and finish specified herein, and for Work of the size and complexity of this project.
 2. The Contractor shall submit data to the Engineer to support the adequacy of his experience.
 3. In the Contract Drawings and Specifications, concrete, which is to be constructed to a high degree of quality, has been termed "appearance grade concrete". Except for light sandblasting in many areas, appearance grade concrete for this project is smooth, untextured concrete requiring no patterned form liners, exposed aggregates, or mechanical texturing. The specifications set forth detail the requirements for submittals, jointing, form construction, placement and vibrating, repair, surface preparation, and other required techniques in the preparation of high quality concrete. All concrete surfaces, which do not get painted, shall be considered as appearance grade concrete.
- B. Formwork: Unless otherwise indicated, design, construct, erect, maintain, and remove forms and related structures for cast-in-place concrete work in accordance with ACI Manual of Concrete Practice ACI 301 "Specifications for Structural Concrete for Buildings". Forms shall be lined when necessary to provide the specified finishes, unless otherwise indicated.
- C. Codes: Comply with the provisions of the latest addition of ACI 318, ACI 211.1, and ACI 347 except as otherwise indicated. Where provisions of ACI Codes are in conflict with the Florida Building Code, the Florida Building Code will govern.
- D. Formwork Tolerances: ACI 301 Chapter 4 except as required herein for specified concrete tolerances. Concrete deck - 1/8 inch maximum deviation for 10 feet long straightedge placed anywhere on the surface.

E. Maximum allowable deviations from dimensions, elevations, slopes and positions, unless otherwise indicated.

1. Footings:
 - (1) Width, depth, and length: Plus 2 inches; minus ½ inch.
 - (2) Misplacement or eccentricity: One inch.
 - (3) Elevation of top: Plus or minus 1/4 inch.
2. Top of all other base courses: Plus 0, minus 1/2 inch from course profile elevation at every point and if slope is indicated, plus or minus 1/4 inch in 10 feet.
3. Tops of slabs or topping: Plus or minus 1/16 inch at each point. If slope is indicated, slope uniformly to indicate low points. Top elevations and slopes at U3 finish shall be absolute, as determined by surveying instruments.
4. Top elevation of slabs not otherwise specified: Plus or minus 1/4 inch at each point; and if slope is indicated, plus or minus 1/8 inch in 10 feet.
5. Top elevation of columns, slabs, wall and piers: Necessary to join the adjacent surfaces shall not have more than plus or minus 1/8 inch difference.
6. Plumb of columns, piers, walls, vertical joints not exposed to view in finished structure: 1/4 inch in 10 feet, not exceeding one inch total.
7. Plumb of columns, piers, walls, vertical joints and grooves and other prominent vertical lines exposed to view in finished structure: 1/4 inch in 20 feet, not exceeding 1/2 inch total.
8. Level and grade of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines: Plus or minus 1/4 inch in 20 feet, not exceeding plus or minus 1/2 inch in entire length.
9. Level and grade of slab soffits, ceilings, beam soffits and rises measured before removal of supporting shores: Plus or minus 1/4 inch in any 10 foot length; 3/8 inch in any 20 foot length; not exceeding 3/4 inch maximum for entire surface.
10. Cross sectional dimension of columns, beams and slabs: Plus or minus 1/4 inch, except increase thickness of slabs on grade as necessary to achieve indicated top elevation and slope.
11. Thickness of walls: Minus 1/4, plus 1/2 inch.
12. Position of linear building lines not otherwise specified and distance from related columns, walls, and partitions: Plus or minus 1/2 inch at all points and not over 1/2 inch in any 20-foot length.
13. Rise of Steps: Plus or minus 1/16 inch in consecutive steps and plus or minus 1/8 inch in total rise of flight.
14. Tread of Steps: Plus or minus 1/8 inch in consecutive steps and plus or minus 1/4 inch in total flight.
15. Location of sleeves, size and location of floor openings and wall openings: Plus or minus 1/4 inch.
16. Misplacement of Work Points with respect to theoretical grid position: 1/8 inch.

F. Sampling and Testing:

1. Tests for concrete materials: Section 03305, PORTLAND CEMENT CONCRETE.
2. Quality control testing during construction:
 - a. Concrete will be sampled and tested by the Project Testing Laboratory

during the placement of concrete as follows:

- 1) Sampling fresh concrete: ASTM C172.
 - 2) Slump: ASTM C143; one test for each concrete load at point of discharge or as required and one test for each set of compressive strength test specimen.
3. Air content: ASTM C173, volumetric method; one test for each set of compression test specimens.
- a. Compression test specimens: ASTM C31; one set of three (3) standard cylinders for each compressive strength test.
 - b. Compressive strength tests: ASTM C39; one set for each 50 cubic yards, or fraction thereof, of each concrete class and type in any one day; one specimen tested at seven (7) days; and two (2) specimens tested at 28 days.
 - c. Core tests: Core samples of in-place concrete will be made when cylinder breaks are such that there is reasonable doubt that the specified concrete strengths have been attained in the structure. Tests will be conducted to determine the strength and other characteristics of the in-place concrete in accordance with ASTM C42, by load testing or analysis as specified in ACI 318, or other tests as required. The Contractor shall pay the cost of core test taken to determine the specified concrete strength in lieu of acceptable cylinder breaks.
 - d. Workmanship: Concrete Work which does not conform to the specified requirements, including strength, color, tolerances, and finishes, shall be corrected or replaced at no cost to the owner.
- G. Sample Panels: Provide sample for roof top concrete wearing surface and warehouse main floor slab as indicated in Article 1.02.G.3. Revise and correct to produce required finish and surface. Construct additional samples if results from original wall section are not satisfactory to the Engineer. The continuity of color and texture for exposed concrete surfaces if of prime importance. Maintain controls and procedures, in addition to those specified, necessary to provide continuous match of concrete Work with accepted samples.
1. Engineer's samples: Samples of finishes acceptable to the Engineer are available for review by the Contractor before starting Work. Coordinate procurement and selection of materials and design, mixing, placing and finishing of concrete, to obtain acceptable color and finish in completed Work.
 2. Formwork samples: Provide formwork for mock-up or sample panels as required for cast-in-place concrete Work specified. Construct forms using facing materials required to provide specified finishes and textures. Do not proceed with structure formwork until the Engineer has accepted sample units and forms.
 3. Field constructed samples: Fabricate sample sections representative of specified finished surfaces, in locations designated by the Engineer. Form, reinforce, mix, cast, cure and finish sample units using materials and methods proposed for construction Work. Provide sample sections as follows:

- a. Wall section, approximately four (4) feet high by four (4) feet wide by six (6) inches thick, unless otherwise shown. Form faces shall represent AF3 finish. Provide a safe footing and temporary bracing as needed to prevent the accidental tilt-over of the sample wall panel. Include not less than two (2) form ties; two (2) form panel intersections, one vertical construction joint, and one horizontal construction joint.
- b. Column section, approximately four (4) feet high and not less than 17 inch diameter for round sections and not less than 12 inches in least dimension for rectangular sections, unless otherwise indicated. Bevel exposed edges of rectangular sample columns.
- c. Demonstrate special finishing, such as sandblasting or other surface texture. Conduct mechanical finishing in the presence of the Engineer, and conform to any control samples provided by the Engineer.
- d. Do not remove sample panels without written permission from the Engineer. When required, remove sample panels from the site.

1.03 SUBMITTALS: In accordance with the General Conditions, submit the following:

- A. Show details of form types; methods of form construction and erection; falsework; design computations; locations of form joints, form ties and construction joints; scheduled date and rate of placing, and mix designations. Submit concrete placement sequence to Engineer for review and approval. Submit shop drawings and design calculations for shoring, signed and sealed by a Florida Registered Engineer.
- B. Product Data: Name and description of the following materials and accessories:
 1. Tie rods and cones.
 2. Circular column forms.
 3. Flat form material.
 4. Release agent.
 5. 6 mil. Polyethylene vapor barrier.
 6. Waterstop.
 7. Vibrator frequency and head weight.
 8. Admixture.
- C. At least 24 hours before placing any concrete, submit signed certification providing the following:
 1. Exact location and portion of structure to be placed.
 2. Date and time concrete is to be placed.
 3. Type of concrete to be used (mix), and the method to be used in placing the concrete.
 4. Estimated quantity of concrete to be placed.
 5. That line and grade have been checked and grade properly compacted.
 6. That location, type, size and spacing or reinforcing has been checked and are as indicated.
 7. That any water stops, construction joints, or seals have been placed and are as indicated on the drawings.
 8. That any embedded pipes have been placed and are correct size, type and are as indicated on the drawings.

9. That embedded conduits, grounding wires or receptacles have been placed and are as indicated on the drawings.
10. That any embedded anchor bolts, bearing plates, dowels etc. are in place and are of the correct size and located as indicated on the drawings.
11. That forms are properly located and adequately braced.

Note: Contractor will not be permitted to place any concrete until he complies with the above as verified by the field inspector.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Normal Portland Cement Concrete: Section 03305, PORTLAND CEMENT CONCRETE.
- B. Concrete Reinforcement: Section 03200, CONCRETE REINFORCEMENT.
- C. Polyethylene Vapor Barrier: Membrane with a permeance of less than 0.3 perms determined in accordance with ASTM E96, glass fiber reinforced so as to be resistant to deterioration and puncture during construction.
- D. Abrasive Aggregate for Dry Shake Slip-Resistant Finish: Aluminum oxide or silicon carbide; well graded in size from particles retained on the No. 30 sieve to those passing the No. 8 sieve. Provide at the rate of minimum 100 pounds per 100 square feet.
- E. Dovetail Slots: Galvanized Steel, 16 gauge, 1 x1 inch, with 5/8 inch throat, fiber filled.
- F. Strip Seal Retainer: ASTM A36 steel, galvanizing ASTM A123.
- G. Anchor Bolts, Nuts and Plates: Bolt ASTM A449. Plates ASTM A36 galvanized, Galvanizing ASTM A123.
- H. Form Release Agent: Form Release agent as manufactured by Dayton Superior or approved equal.

2.02 MIXES:

- A. Portland Cement: Concrete: Section 03305, PORTLAND CEMENT CONCRETE.
- B. Repair Grout for Surface Repair and Bond Coat:
 1. For repair, one part Portland cement to two (2) parts fine sand, and water to produce stiff mortar. For bond coat, one-part Portland cements to one part fine sand.
 2. Blend white and gray Portland cement to produce color matching surrounding concrete as determined by trial patch.
 3. Catalytic agents for increasing bond and decreasing water requirements may be used up to one percent by weight, subject to approval of the Engineer.

- C. Non-shrink Grout for Grouting Structural Members and Equipment:
1. Use non-shrink non-metallic grout conforming to Corps of Engineers Specification CRD-C588-78 Type (d), with no shrinkage in the plastic state in accordance with ASTM C827.
 2. Use non-shrink non-metallic grout under bearing plates, in recesses, holes or surfaces under structural members, equipment and machinery, and at other indicated locations.
 3. Do not use staining ingredients in grout exposed to view.
 4. Mix in accordance with manufacturer's printed instructions.
- D. Epoxy Mortar Approved two-component (2) product with a three-day (3) minimum compressive strength of 5,000 psi. The two-component (2) product shall be mixed and applied in accordance with manufacturer's instructions.

PART 3 - EXECUTION

3.01 APPEARANCE GRADE CONCRETE:

- A. Extent: Construct cast-in-place concrete as appearance grade concrete, as specified in Article 1.02.A.3, with the exception of the following:
1. Unformed concrete, such as that in slabs, toppings, and ramps.
 2. Concrete which is to be covered with earth.
 3. Surfaces of which are interior surfaces not visible to the public, such as in shafts, pits, and utility spaces.
- B. Proportioning: Section 03305, PORTLAND CEMENT CONCRETE.

Forms:

1. Design forms to provide the indicated finish. Limit the deflection of form facing materials between studs, as well as the deflection of studs and walers, to 1/240 the span length.
2. Design forms for easy removal without damage to the finished concrete.
3. Arrange the panels in the forms in orderly fashion, with joints between panels, expansion joints, and rustications laid out equally spaced, symmetrical with relation to such elements as centerlines, corners and major openings.
4. Place tie holes in rustications or other emphasized joints. Where there are no rustications or joints, place ties in orderly vertical and horizontal lines, evenly spaced at 24 inches on centers unless otherwise indicated.
5. Place tapered, removable cones at the rod ends in exposed concrete faces except where plane tie rod hole patching is indicated.
6. Do not reuse forms if there is any evidence of surface wears or defects. Clean and coat forms as indicated.
7. Observe formwork continuously while concrete is being placed to see that there are no deviations from desired elevation, alignment, plumbness and camber. If, during casting, weakness develops and the formwork shows settlement, deflection or distortion, stop the work, remove improperly cast concrete, and reconstruct the formwork to perform properly.

8. All formwork to comply with latest edition of A.C.I. Standards 347.

3.02 FORMWORK MATERIALS AND ACCESSORIES:

- A. Provide formwork materials and accessories of permanent and temporary nature. Materials and accessories shall be non-corroding and non-staining under conditions of service and storage. When temporary materials are used, bring them to original condition before reuse. Discard damaged and corroded materials, and materials which, by wear or change during earlier uses, will cause change in the color or texture of the concrete.
- B. Steel Forms: Uncoated steel, 3/16 inch minimum thickness, fabricated to close tolerances, protected only by the specified release agent, braced so as not to bend, dent or dimple under wet concrete loads, vibrator impact, and tool impact. Maintain steel forms in rust-free condition by use of steel wool and light grinding, followed by coats of the specified release agent. Forms shall be adjustable to be brought into true alignment without stops or ridges.
- C. Medium Density Overlay (MDO) Plywood Forms: PS-1, B-B High Density Concrete Form Overlay, Class I, unoled.
 - 1. Butt form panels make contact surface fully flush and seal butting holes with sponge form tape. Chamfer edges of beams and ceilings.
 - 2. Where MDO plywood is used to form ceilings or beams, use no piece of MDO plywood that has been patched or damaged.
- D. Plywood Forms: PS-1, B-B Concrete Form, Class I, unoled.
- E. Rustication Strips: Varnished ponderosa pine strips or equally rigid non-staining plastic, 3/4 inch deep, 1-1/2 inches by 1 inch, suitable for fastening from outside form by non-corroding fasteners.
- F. Drip Forms: Varnished ponderosa pine or equally rigid non-staining plastic, 1/2 inch wide on each leg.
- G. Bevel or Chamfer Strips: Non-staining plastic, 3/4 inch wide on each leg.
- H. V-Grooves: Varnished ponderosa pine or equally rigid non-staining plastic, 3/4 inch on each leg.
- I. Plugged Cone Form Ties: Rod type, with ends or end fasteners which can be removed without spalling the concrete and which leave a hole equal in depth to the required reinforcement clearance. Form ties shall be of a design in which the holes match the surface of the hardened concrete. Provide removable cones 1-1/4 inches in diameter by 1-1/2 inches deep. Provide performed mortar plugs to match the color of the concrete, recessed 1/4-inch, adhered with an approved two-part epoxy.
- J. Weep Hole Forms: PVC, polyethylene, or ABS pipe, matching color of the concrete, 4 inch inside diameter. Outlet cutoff shall project 1-1/2 inches form wall and shall be in a plane parallel to it.

- K. Inserts: Galvanized cast steel or galvanized welded steel, complete with anchors to concrete and fittings such as bolts, wedges and straps. Provide hanger inserts spaced to match grid of suspended ceilings.
- L. Release Agent: For steel forms, use an approved material that will not color, stain or otherwise affect the finish of the concrete. For wood forms, use a natural non-petroleum base, non-staining, non-retarding, and non-dusting low gloss release agent.
- M. Shoring: As designed and executed by Contractor to support all loads. Contractor to submit shop drawing and design calculations signed and sealed by a Florida Registered Engineer.
- N. Column Forms: Shall be fabricated of four pieces, clamped watertight without horizontal joints. Horizontal construction joints will be installed as indicated.

3.03 FORMWORK DESIGN:

- A. Design and execute watertight formwork in accordance with ACI 347 Chapter 1 that will withstand the pressure resulting from the placement and vibration of the concrete, which will not stain the concrete, and which is sufficiently hard and rigid. The maximum deflection between form supports shall be 1/240 span length.
- B. Do not use earth as a form except in cases of solid rock, which has been trimmed to the precise profile of the work to be cast.
- C. The design, engineering, and construction of the formwork shall be the responsibility of the Contractor.
- D. Make forms sufficiently tight to prevent loss of mortar from the concrete. Do not use tape on interior face of forms to achieve water-tightness, except at concrete faces not exposed to view. Seal form edges by such means as gasketing material or sealant placed in the joints in such a way that neither fin nor groove is made in the face of the cast concrete. If forms must be drilled for tie rods, make hole fit tie tightly so as not to leak.
- E. Place bevel or chamfer strip on external corners of concrete. Do not bevel internal corners of concrete unless otherwise indicated.
- F. Camber formwork to compensate for anticipated deflections prior to hardening of the concrete so as to maintain specified dimension tolerances.
- G. Securely brace forms against lateral deflection and settlement. Provide positive means of adjustment of shores struts and walers, by means of jacks, wedges and adjustable ties so that deflection and settlement can be adjusted during concrete placement.
- H. If indicated, provide ties spaced equally vertical and horizontal at walls and columns. Center tie layout both vertically and horizontally within structural bays or bays formed by expansion joints or rustication joints. Form columns using external form clamps, without use of ties.

- I. Form columns using four-piece MDO plywood at exterior or PS-1 plywood at interior column, which leave no impression or joints in the hardened concrete.

3.04 CONSTRUCTION OF FORMS:

- A. Use V-groove and rustication strip in forms or as indicated. Place drip forms as indicated.
- B. Where form ties and rustication joints occur together in concrete work, lay out the rustication strips as indicated and lay out form tie rows to fall within rusticated joints wherever possible.
- C. At construction joints, place a rustication strip at the exposed edge of the joint at the plane in which concrete placement is stopped.
- D. When placing or reworking formwork at construction joint prior to the next casting, place a rustication strip in the previously formed joint, lap the outer form 1/2 inch to 1-1/2 inches over previously formed surface, and seal both strip and form against mortar leakage or intrusion.
- E. Anchor formwork to shores and other supporting surfaces or members in such a way that upward or lateral movement of any part of the formwork during concrete placement and consolidation is prevented.
- F. Support runways for moving equipment on structural members, shoring or walers.

3.05 PREPARATION OF FORM SURFACES:

- A. Clean mortar, rust and dirt from form surfaces before placing concrete.
- B. Before placing either the reinforcing steel or concrete, cover the surface of the form with specified release agent.

3.06 REMOVAL OF FORMS:

- A. When concrete surfaces are to be repaired or further finished, remove forms as soon as the concrete has hardened sufficiently to resist damage from removal operations.
- B. Remove top forms on sloping surfaces of concrete as soon as the concrete has attained sufficient stiffness to prevent sagging. Perform needed repairs at once; then start curing.
- C. Loosen wood forms for wall openings as soon as possible without damaging concrete.
- D. Forms and shoring used to support the weight of concrete in beams, slabs and other structural members shall be kept in place until the concrete has reached the minimum strength or time period specified for removal of forms and shoring.

- E. When shores and formwork framing are arranged so that non-load bearing form facing panels may be removed without loosening or disturbing the shores or framing, the form facing may be removed at an earlier age as will not damage the structure.

3.07 REMOVAL STRENGTH:

- A. Maintain formwork in place for the following structural condition until the concrete has attained either the minimum percentage of indicated design compressive strength or for the period of time specified in the following table:
- B. Time periods in the following table include all days except those in which the temperature falls below 40 degrees F.

Minimum Compressive Strength for Form Removal Normal (Percent of Structural Normal High-Early Required Member or Strength Design Condition Concrete Strength)

Cantilevers 12 days 7 days 90%

Over 20 feet between supports 12 days 7 days 90%

Stairways 10 days 5 days 80% Floor slabs, and bottom of caps 5 days 3 days 70%

Free standing walls, column and piers 5 days 3 days 70%

Walls, columns, sides of beams, footings, slabs on grade, and vertical surfaces 24-48 hrs
12-24 hrs 70 Front face form of roof top curbs 6-24 hrs 6 hours 70

3.08 CONSTRUCTION JOINTS:

- A. Locate construction joints as indicated. Joints shall be located so as not to impair the strength and appearance of the work. Where a location for a construction joint must be selected, locate it, where possible, at a rusticated joint line in the concrete.
- B. After the pour has been completed to the construction joint, and before placing fresh concrete, clean reinforcing steel and the surfaces of horizontal and vertical construction joints of surface laitance, curing compound, and other materials foreign to the concrete. Surfaces of horizontal construction joints, where expansion joint fillers or bond breaking compound is to be placed as indicated, shall be cleaned of dirt, sawdust, and other loose materials. Moisten surfaces on which concrete is to be placed immediately before placing concrete.
- C. When it is necessary to make a construction joint because of an emergency, furnish and place additional reinforcing steel across the joint at no additional expense to the owner.
- D. When new concrete is shown to be joined to existing concrete by means of bar reinforcing steel dowels mortared in holes drilled in the existing concrete, the holes shall be drilled to the required depth, blown out, wetted and filled with epoxy mortar, after which the dowel shall be inserted and left undisturbed until the mortar is hardened.

3.09 EXPANSION AND CONTRACTION JOINTS:

- A. No reinforcement or other fixed metal items shall be run continuous through expansion and contraction joints, unless indicated.
- B. Construct open joints at the locations indicated, by means of a wood strip, metal plate, or other approved material to be subsequently removed.

3.10 WATERSTOPS:

- A. The configuration and location of waterstops in construction joints and expansion joints shall be as indicated, or as ordered by the Engineer, see Architecture for the water stops specification.
- B. Provide waterstops in maximum practicable lengths, with thermal or solvent joints at all cuts, breaks and corners.

3.11 INSERTS AND OTHER EMBEDDED ITEMS:

- A. Place sleeves inserts, anchors, weep holes, and other embedded items needed for adjoining work or for its support before placing concrete.
- B. Give ample notice to trades whose work is related to the concrete or supported by it so that they have ample opportunity to introduce or furnish or locate embedded items before the concrete is placed.
- C. Support joint material, waterstops and embedded items against displacement during concrete casting.

3.12 PREPARATION BEFORE PLACING CONCRETE:

- A. Remove hardened concrete and foreign material from surfaces of conveying equipment.
- B. Clean forms of water, dirt, debris, hardened concrete film and lumps bar and wire fragments, and other deleterious matter before concrete is placed.
- C. Seal cleaning holes and make fully flush with interior surfaces of forms. Locate cleaning holes below finish floor level where possible.
- D. Place moisture barrier where indicated over granular fill and bare earth before placing concrete, except at footings. Lap joints six inches.
- E. Compact subgrade smooth, remove debris and deleterious matter, then wet before placing concrete.
- F. Do not place concrete until Engineer has approved forms, reinforcement and embedded items.

3.13 CONVEYING:

- A. Handle concrete from the mixer to the place of final deposit as rapidly as practicable by methods that will prevent segregation, undo drying to temperature rise, or loss of ingredients, and in a manner that will maintain the required quality of concrete.
- B. Use conveying equipment, of size and design to maintain a continuous flow of concrete at the delivery end, acceptable to the Engineer. Do not use conveying equipment with aluminum parts, such as chutes, hoppers, or scrapers, which could come in contact with the concrete during conveying.
- C. Use belt conveyors which are horizontal or at a slope which will cause neither segregation nor loss. Use a baffle board or other arrangement at the discharge end to prevent segregation. Discharge long runs into hopper without segregation. Do not allow concrete to adhere to the return belt.
- D. Use chutes which are steel or steel-lined, and which have a slope not exceeding one vertical to two horizontal and not less than one vertical to three horizontal. Chutes more than 20 feet long, and chutes not satisfying slope requirements, may be used if the chutes discharge into a hopper, designed to prevent segregation, before distribution.
- E. Place concrete in forms using troughs, chutes or pipes with the end held not more than three feet above the surface of the base form or the concrete. Troughs, chutes or pipes shall have steel hoppers tops with sides sloping at least 45 degrees.
- F. Use bottom-drop buckets to place concrete wherever possible. Buckets shall permit gradual release and shall have sides sloping at least 45 degrees near discharge.

3.14 DEPOSITING:

- A. Deposit concrete into the forms as nearly as possible to its final position, to eliminate segregation of aggregates. Do not use vibrators for extensive shifting of the mass of fresh concrete. The free drop of concrete shall not exceed three feet without the use of adjustable length pipes. Place column concrete by means of pipes adjustable in length and not less than six inches in diameter.
- B. Layers of concrete shall not taper nor be wedge shaped but shall be built with squared ends and level tops. Deposit concrete continuously or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. Place concrete at such a rate that concrete being integrated with fresh concrete is plastic. Use vibrators to blend the plastic concrete layers.
- C. Remove temporary spreaders in forms when concrete has reached an elevation rendering their service unnecessary.
- D. Align slab top surfaces to screed contours by strike off or if the nature of the finished surface so requires, by vibrating screeds or roller pipe screeds.
- E. Do not place concrete in supported elements until concrete previously placed in

columns or walls is no longer plastic and initial shrinkage has occurred.

- F. Keep covers available at site to protect freshly placed concrete from rain. No exterior concrete shall be placed during rain. The Engineer shall inspect fresh concrete exposed to rain. Engineer shall decide if the damaged concrete be repaired or removed and replaced with no additional expense to the owner.

3.15 CONSOLIDATION:

- A. Consolidate concrete until voids are filled and free mortar appears on the surface. Consolidate concrete by means of internal vibrators.
- B. Vibrators: Minimum frequency of 8,000 vibrations per minute, massivehead, with sufficient amplitude to effectively consolidate concrete.
- C. Employ a sufficient number of vibrators to consolidate the concrete within 15 minutes after depositing in forms. Maintain at least one spare vibrator available at the site of each structure during concrete placement. Do not hold vibrators against the forms or against the reinforcing steel.
- D. The location, manner, and duration of the application of vibrators shall be such as to secure maximum consolidation of the concrete without causing segregation of mortar and coarse aggregate and without causing water or cement past to flush to the surface. The thickness of the layers shall be not greater than can be satisfactorily consolidated by vibrators. Vibrators shall vertically penetrate into the previous layer at regular intervals.
- E. Do not permit vibrators to remain in one area long enough to create a cavity. Plunge vibrators into concrete rapidly so as not to spatter forms or create depressions in the lift.

3.16 PROTECTION:

- A. Make arrangements for cooling and shading concrete in advance of placement, adequate to maintain the required temperature and moisture conditions without injury due to concentration of heat.
- B. Concrete shall have a maximum placing temperature, which will not cause difficulty from loss of slump, flash set, or cold joints.
- C. The temperature of concrete as placed shall not exceed 95 degrees F. When the temperature of the concrete reinforcement is greater than 120 degrees F, spray with water immediately prior to placing concrete.

3.17 BONDING:

- A. Provide longitudinal keys at least 1-1 inches deep or inclined dowels at least 12 inches long at all joints in walls and between walls and slabs or footing, unless otherwise indicated.

- B. When indicated or permitted, obtain bond surface by use of an approved chemical retarder which delays but does not prevent setting of the surface mortar. Remove chemical retarded mortar within 24 hours after placing to produce a clean, exposed coarse aggregate-bonding surface.
- C. After placement has been completed to the construction joint, and before placing fresh concrete, clean reinforcing steel and the surfaces of horizontal and vertical construction joints of surface laitance, curing compound, and other materials foreign to the concrete, and expose clean coarse aggregate of at least 3/8 inch size. Hardened concrete surfaces to be cleaned, by abrasive blast methods to expose coarse aggregate, after the curing period or immediately before placing concrete at the joint. Surface of concrete, which has been in place not more than eight hours, may be cleaned with air and water jets if surface laitance is removed and clean coarse aggregate is exposed. Surfaces of horizontal construction joints, where expansion joint filler or bond breaking compound is to be placed as indicated, shall be cleaned of dirt, sawdust, and other loose materials. Moisten surfaces on which concrete is to be placed immediately before placing concrete.
- D. When new concrete is shown to be joined to existing concrete by means of bar reinforcing steel dowels mortared in holes drilled in the existing concrete, the holes shall be drilled at least 12 inches, blown out, wetted and filled with epoxy mortar after which the dowel shall be inserted and left undisturbed until the epoxy mortar is hardened.

3.18 DEFECTIVE CONCRETE WORK:

- A. Porous areas open or porous construction joints and honeycombed concrete will be considered to indicate that the requirements for mixing, placing and handling have not been complied with and will be sufficient cause for rejection of the members of the structure thus affected.
- B. Defective work exposed upon removal of forms shall be entirely removed or repaired within 48 hours after forms have been removed. Defective areas will be inspected and repair method approved by the Engineer prior to repairs.
- C. Repaired areas will not be accepted if:
 - 1. The structural requirements have been impaired by reducing the net section of compression members;
 - 2. The bond between the steel and concrete has been reduced;
 - 3. The areas are not finished to conform in every respect to the texture, contour, and color of the surrounding concrete.
- D. If the above requirements are not satisfied, the Engineer may require that the members or unit involved be entirely removed and satisfactorily replaced at no additional expense to the owner.

3.19 REPAIR OF SURFACE IMPERFECTIONS:

- A. As soon as possible after stripping forms, thoroughly clean and fill holes left by form ties, and other temporary inserts, and perform corrective work.

- B. The surfaces shall be of a generally uniform appearance with regard to color and texture and shall have a smooth finish.
- C. Small surface holes caused by air bubbles, normal joint form marks and minor chips and spalls will be tolerated in limited areas but not major or unsightly imperfections, honeycombs or structural defects will be permitted without carrying out remedial work, if and as approved by the Engineer, to remove such imperfections.
- D. In general, pinholes and hole smaller than 1/4 inch in diameter and not more than 1/2 inch deep may be left unfilled if their distribution is random or if they do not form unsightly clusters or if they are not rusty or discolored.
- E. Remove imperfect texture, laitance, fins and roughness by rubbing affected areas with concrete block or carborundum stone until smooth and uniform.
- F. Holes 1/4 inch to 3/4 inch in their greatest dimension, which are not more than 1 inch deep, shall be cleaned of to match the color of the concrete when dry. Deeper holes shall be repaired only after the Engineer has approved their effect on structural integrity.
- G. Obtain approval of the Engineer before performing repair work other than the removal of imperfect texture, filling of pin holes, holes less than 3/4 inch wide, and insert holes. The Engineer will determine whether the defective area is sufficiently imperfect to warrant rejection of the structural unit.
- H. Defects that are not subject to rejection, clean the holes honeycombed areas, cracks, spalls, and discolored areas of oily or bond breaking substances. Roughen or key the surface of each defect and coat the bottom and sides with a non- staining acrylic or epoxy bonding agent. Cut back spalled loose porous material until coarse aggregate will break under chipping rather than non-shrinking grout or epoxy- Portland cement intrusion grout that has been formulated to match the color of the concrete when dry. Tamp grout and strike off color of the concrete when dry. Tamp grout and strike off flush with surrounding concrete without smearing. Confine the grout until cured keeping it damp when exposed to sun or other rapid drying.

3.20 PROTECTION FROM AND REMOVAL OF STAINS:

- A. Protect the concrete structure from rust staining by structural steel members and from other substances during the work. Do not allow dirt to accumulate on horizontal surfaces where it can be washed down over vertical surfaces by rain. Keep flat surfaces swept clean.
- B. If staining does occur, remove stain and restore the concrete to its original color and finish.

3.21 FINISHING OF FORMED SURFACES:

- A. After removal of forms, finish the surface of the concrete, as indicated, in a manner as specified below.

- B. All exposed concrete shall be cast and finished as appearance grade concrete except the following:
 - 1. Surfaces which are covered with earth and which are more than 12 inches below finish grade.
 - 2. Surfaces, which are encased in other materials.
 - 3. Surfaces, which are to receive waterproofing.
 - 4. Interior exposed concrete surfaces of shafts, pits, sumps, equipment rooms, and storage rooms.
- C. Appearance Grade Concrete: Use smooth MDO plywood or steel form. Do not use form facing with raised grain, torn surfaces, worn edges, patches, dents, or other defects that will impair the texture of the concrete surface. Patch tie holes and defects. Remove fins completely.

3.22 SLAB PLACEMENT AND JOINTING

- A. Coordinate time of mixing and placing with finishing.
- B. Locate joints in interior slabs on grade maximum spacing as shown on the drawings.
- C. Locate joints in slabs on grade at 20-foot intervals in both directions unless other spacing is shown on drawings.
- D. Where sawed joints are indicated, saw joints as soon as the concrete has hardened sufficiently to prevent aggregates from being dislodged. Complete cutting before shrinkage stresses cause cracking.
- E. Consolidate concrete in slabs using internal vibrators, vibrating screeds, and other means that eliminate air pockets, fully embed reinforcement, and retain sufficient coarse and fine aggregate at and near the top surface.
- F. Do not displace reinforcement during placement and vibrating of concrete. Maintain at middle of slab thickness.
- G. Do not puncture moisture barrier during placement and vibrating of concrete.

3.23 FINISHING SLABS:

- A. After concrete has been consolidated, finish surface in a manner as specified below.
- B. Where a finish is not indicated for cast-in-place concrete slabs, provides a troweled finish.
- C. Floated Finish:
 - 1. Intermediate finish for Broom, Dry Shake Nonslip and Troweled finishes.
 - 2. After concrete has been struck off and leveled, do not work further until ready for floating. Begin floating operations when water sheen has disappeared and

the surface has stiffened. During or after the first floating check the plainness of the surface with a 10-foot straightedge applied at two widely separated angles. Finish surface level to Class B tolerance. Then refloat the slag immediately to a uniform sandy texture. Do not apply membrane-forming curing agent. Use only wet burlap or plastic sheet to cure.

D. Broom Finish:

1. Sidewalks, Ramps, Curb Cuts, Handicapped Curb Ramps, Outside Service Slabs and Concrete Apron.
2. Immediately after the concrete has received a float finish as specified in 3.23C above, it shall be given a coarse transverse scored texture by drawing a broom across the surface. Samples must be shown to the Engineer/Architect for approval.

E. Dry Shake Nonslip Finish:

1. Main Floor
2. After surface has been give an float finish as specified in 3.23C above, apply 100 pounds of abrasive aggregate per 100 square feet by a method that ensures even coverage without segregation. Begin floating immediately after first application of dry shake. After the dry shake has been embedded by floating, apply an additional eight pounds of abrasive aggregate per 100 square feet at right angles to be previous application. After the dry shake has been embedded by the floating, lightly trowel the surface until both float and trowel marks are removed, and then lightly texture the surface with a fine broom. Cure the surface by using wet burlaps for seven days.

F. Troweled Finish:

1. Mezzanine Floor, Mechanical and Electrical Rooms and Other Rooms with Exposed Concrete Floors.
2. After surface has been given a float finish as specified in 3.23C above, power trowel the surface to produce a smooth surface which is free of defects but which may still show some trowel marks. Perform additional trowelings by hand after the surface has hardened sufficiently. Consolidate the surface completely by the hand troweling operations. The finished surfaces, which are to receive resilient floor covering or carpet, grind all defects, which will show through, or cause local wear in the finish materials. Use only wet burlap or plastic sheets to cure.

3.24 CURING AND PROTECTION:

- A. Beginning immediately after placement, protect concrete from premature drying, temperatures above 100 degrees F and below 32 degrees F, and mechanical injury. The materials and methods of curing and protection shall be subject to approval by the Engineer.
- B. Keep concrete continuously under cure until the accumulated time, during which the temperature of the air in direct contact with the concrete has been warmer than 55

degrees, is at least five days for bottom slabs and footings and seven days for all other concrete.

C. Use one of the following methods specified as limited or directed by the Concrete Finish Schedule:

1. Ponding: Keep the surface submerged at all times for the required curing period. Do not allow water flow to erode the surface. Keep water clean and free of dirt and debris.
2. Continuous fogging: Accomplish by fogging with a nozzle, which so atomizes the flow that a mist and not a spray is formed. Do not erode the surface of the concrete. Fog the concrete regularly without allowing part or the entire surface to dry.
3. Wet burlap: Cover the entire area to be cured with double thickness burlap sheet conforming to AASHTO M182, Class 3 or 4, laid directly on the concrete, and keep continuously wet. Polyethylene film, free of holes or tears, keep sheet fully flat, without wrinkles or air bubbles, held down tautly at all edges. Do not use this method on slabs, which will be exposed to view.

D. Hot and Inclement Weather Protection:

1. Make arrangements for cooling and shading concrete in advance of placement, adequate to maintain the required temperature and moisture conditions without injury to concentration of heat.
2. Stop placing concrete when the quantity of rain falling on the surface is sufficient to wash the concrete surface.
3. Concrete shall have a maximum placing temperature, which will not cause difficulty from loss of slump, flash set, or cold joints.
4. The temperature of concrete as placed shall not exceed 95 degrees F, except the temperature of concrete placed in walls and slabs three feet or greater in thickness, shall not exceed 90 degrees F. When the temperature of the concrete reinforcement is greater than 120 degrees F, spray with water immediately prior to placing concrete.
5. Details and methods of placing and handling concrete during how weather shall be in accordance with ACI 305.

E. Protection from Injury:

1. During the curing period, protect concrete from damaging mechanical disturbances, such as load stresses, impact, and heavy vibration. Protect concrete surfaces from damage by construction equipment, materials and methods, by curing methods, rain, or running water.
2. Do not load self-supporting structures in such a way as to overstress the concrete.
3. Do not permit gunpowder or other power driven fasteners to be used in concrete. Use drilled, metal-shielded bolts only unless predetermined and approved by the Engineer.

END OF SECTION

SECTION 03305

PORTLAND CEMENT CONCRETE

PART 1- GENERAL

1.01 DESCRIPTION

- A. This Section specifies normal Portland cement concrete, including materials, proportioning, batching, mixing, delivering and testing.
- B. Portland cement concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, and water, with admixtures as approved, proportioned and mixed as specified herein.
- C. Classes of Concrete:
 - 1. Classes of concrete are designated by a numeral indicating the minimum 28-day compressive strength in pounds per square inch as determined by ASTM C39.
 - 2. Each class of concrete may consist of one or more mixes determined by the maximum size and type of aggregate, cement factor and types of admixtures or special aggregates used. Types shall not be varied within a given structural element.
 - 3. Each mix within a class will require approval of the design mix prior to use.
 - 4. The class of concrete included in this section is Class 4500.

1.02 DESIGN CRITERIA:

- A. Normal Portland Cement Concrete:
 - 1. General requirements:
 - a. Concrete mixes shall have a minimum water content per cubic yard of concrete consistent with required slump, a cement content corresponding to the 03305-1 appropriate water-cement ratio, the Specified maximum size of coarse aggregate, and the required percentage of fine aggregate. Design mixes shall be as recommended by ACI 211.1 and ACI-301 for normal weight concrete. However following limits shall govern the concrete mix design over and above ACI requirements.
 - b. Air entrainment - 4 + 1 % - use vinsol resin type air-entraining Agents. The design mixes for each class of concrete used shall be as determined by the Contractor through an approved design laboratory and accepted by the Engineer to produce the results as specified herein.
 - c. For each class of concrete there shall be as many design mixes as there are different combinations or types of ingredients anticipated to cover the requirements of the work. Each concrete mix shall be submitted to

the Engineer for approval.

- d. Admixtures shall not contain more than 0.5% chlorides or Thiocyanates.
 - e. Use Chloride-free superplasticizers type G (Sulphonated Naphthalen type) in accordance with ASTM C494 as required to achieve a workable concrete mix.
 - f. Weight of normal weight concrete shall not be less than 138 pounds per cubic foot.
 - g. Add hardener in concrete for slab on Grade and roof top secondary concrete topping slab.
2. Strength: Design concrete mixes based on the required over-design factor according to ASTM C94, and assuming a coefficient of variation equal to 15. Contractor shall be responsible for submitting the concrete mix design for Engineer/Architect approval. Design each class of concrete so that not more than 5 percent of the strength tests will have values less than specified strength, and the average of any three consecutive strength tests will be equal to or greater than the specified strength.

Minimum Compressive Strength at 28 days- Class of Concrete	Max. Water/ Cement Ratio (lbs/lbs)	Minimum Cement Factor (lbs per cubic yard of Concrete)	Maximum Slump (Inches)
4000	0.40	640	* 4 inches

*May be increased by 1 inch if proper method of consolidation is used and approved by the Engineer.

1.03 QUALITY ASSURANCE:

A. Design Mix:

- 1. Once a design for any class of concrete is accepted, it shall not be varied as to source, quantity, grading of materials, proportioning, or in any other way.
- 2. Proposed changes shall be accomplished by preparing and having approved a new design mix as specified above.
- 3. Determine the chloride content of the component concrete materials, excluding admixtures for concrete and provide this information to the Engineer when submitting mix design. Design mixes will not be approved when the sum of chloride content of component materials indicates that the concrete mix derived from those materials will have a chloride content exceeding 0.40 pound per cubic yard of concrete. When the source of any component material for the

concrete is changed or when the design mixes is altered, a chloride content determination test shall be made immediately. Resubmit the altered design mix for approval by the Engineer.

- B. Sampling and Testing: Concrete ingredients will be sampled prior to use and tested in accordance with the methods specified. Subsequently, materials will be tested as often as necessary to verify that the materials conform to the specifications and that quality of product is maintained.
- C. Slump: Quantity of water in concrete shall be based upon w/c ratio and slump described in 1.02-A-2. Add super plasticizers to achieve the workable slump described below.

	<u>Vibrated</u>	
	<u>Placing</u>	
1.	Concrete slab on grade	0 to 6 inches
2.	Unreinforced concrete other	0 to 6 than above inches
3.	Reinforced concrete (U.N.O.)	5-1/2 inches
4.	Reinforced concrete deck	5 inches
5.	Concrete placed by pumping	1 to 6 inches
- D. Air Entrainment: The entrained air content shall be 6 + 1%.

1.04 SUBMITTALS: In accordance with Division 1, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES, submit the following:

- A. Design Mixes: Design mixes for each class of concrete indicating that the concrete ingredients and proportions will result in a concrete mix meeting the requirements specified.
- B. Hot Weather Concreting: Proposed methods for compliance with hot weather production and delivery requirements of ACI 305.
- C. Certificates:
 - 1. Submit with each design mix, laboratory test reports and mill and manufacturer's certificates attesting to conformance of ingredients with specifications.
 - 2. In case the sources, brand of characteristic properties of the ingredients need to be varied during the term of the Contract, submit revised laboratory mix report for approval.
 - 3. Submit certification for each admixture used certifying that it is identical in Composition to the sample used for design mix approval, and is compatible with all other materials in the design mix and is contained in the current List of Approved Products of the State of Florida Department of Transportation, Office of Materials and Research.
 - 4. Chloride determination shall be provided by the Contractor who will certify that there are no chloride contents in the concrete. Properly executed certificates

showing the chloride content will be required for acceptance of any structural element constructed under these specifications. The Engineer reserves the right to monitor the chloride content through test on samples obtained by his own personnel.

D. Batch Tickets: Submit a delivery ticket from the concrete supplier with each batch delivered to the site setting forth the following information:

1. Name of ready-mix batch plant.
2. Serial number of ticket.
3. Date and truck number.
4. Name of contractor.
5. Job number.
6. Specific classes or designation of concrete.
7. Quantity of concrete (cubic yards).
8. Time loaded or first mixing of cement and aggregates.
9. Water added by receiver of concrete (if any), and his initials.
10. Type and name of admixture, and amount of it.
11. Mixing time, or readings of revolution counter at beginning and end of mixing period.
12. Type and brand of cement and of fly ash.
13. Amount of cement, and of fly ash in pounds.
14. Total water content by producer, in pounds (or W/C ratio).
15. Maximum size of aggregate and gradation.
16. Weight of fine and coarse aggregate itemized in pounds.
17. Indication that all ingredients and mix proportion is certified as being previously approved.
18. Signature or initials of ready-mix representative.
19. Type of fly ash, and the amount of it.

E. Concrete Pour Sequence Plan. Submit concrete pour sequence plan to the Engineer approval prior to start of concrete work.

1.05 DELIVERY, STORAGE AND HANDLING:

A. Aggregates:

1. Transport and stockpile aggregates separately according to their sources and gradations. Handle aggregates in accordance with ACI 304R, Chapter 2, to prevent segregation and loss of fines. Do not allow contamination.
2. Do not use aggregates showing segregation, or allow the different grades to become mixed.
3. Do not use aggregates from different sources or different gradations alternately. Do not allow mixing of aggregates in stockpiles.
4. Do not transfer aggregates directly from trucks, railroad cars or barges to the proportioning bins when moisture content is such that it will affect the accuracy of the proportioning of the concrete mixture. In such case, stockpile the aggregates until a saturated surface-dry condition is obtained and maintain aggregates in such condition.

5. Do not increase moisture content or cool by the use of water, which may discolor aggregates.

B. Packaged Cement:

1. Deliver to the mixing site in original, sealed packages, labeled with the weight, name of manufacturer, branch and type specified. Store packages in water tight enclosures.
2. Do not deliver packages varying more than three percent from the specified weight.
3. Do not use different types or brands of cement, or the same type or brand of cement from difference sources, without approval.

C. Bulk Cement:

1. Store separately from packaged cement and provide protection to prevent deterioration from exposure to moisture and intrusion of foreign matter.
2. Provide facilities for sampling at the weighing hopper or in the feed line immediately before entering the hopper.
3. Do not use different types or brands of cement, or the same type or brand of cement from difference sources, without approval.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Portland Cement: ASTM C150; Type I, II or III.

B. Admixtures and Additives:

1. Air-entraining admixtures: ASTM C260.
2. Chemical admixtures for concrete: ASTM C494, Type D.
3. Calcium chloride: The use of calcium chloride is prohibited.
4. Superplasticizers: ASTM C494. Type of super plasticizer to be recommended by the concrete manufacturer and approved by the Engineer.

C. Water: Potable, from city water supplies or other sources, which are approved by a public health department.

D. Concrete Aggregate:

1. The stone shall comply with the soundness requirements of ASTM C33. Soundness Tests should be made at the option of the Engineer.
2. Coarse aggregate gradation: Aggregate size 57 in accordance with ASTM-C33.

PERCENT BY WEIGHT OF COARSE AGGREGATE PASSING SQUARE-OPENING LABORATORY SIEVES

Size No.	1 1/2 in.	1 in.	1/2 in.	No.4	No.8
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57 100 95-100 25-60 0-10 0-5

The above gradation represents the extreme limits for the various sizes indicated, which will be used in determining the suitability for use of coarse aggregate from all sources of supply. For any grade from any one source, the gradation shall be held reasonably uniform and not subject to the extreme percentages of gradation specified above.

3. Fine aggregate: Silica sand or Miami Oolitic rock screenings.

- a. Fine aggregate shall be free from lumps of clay, soft or flaky particles, salt, alkali, organic matter, loam or other extraneous substances. The weight of extraneous substances shall not exceed the following percentages:

Material passing the No. 200 sieve.....	4.0
Shale.....	1.0
Coal and lignite.....	1.0
Clay lumps.....	1.0
Cinders and clinkers.....	0.5

In addition, the sum of the percentages of all materials listed in the above table shall not exceed five.

- b. Fine aggregate will be subjected to the colorimetric test for organic impurities, and if the color produced is darker than the standard solution, the aggregate will be rejected unless it can be shown by appropriate tests that the impurities causing the color are not of a type that would be detrimental to the concrete. Such tests shall be in accordance with AASHTO Methods T71 and M6.
- c. Silica sand fine aggregate shall be reasonably well graded, from coarse to fine and when tested by means of laboratory sieves, it shall meet the following requirements in percent of total weight:

Total Retained On:

Sieve	Percent
No. 4.....	0 to 5
No. 8.....	0 to 15
No. 16.....	3 to 35
No. 30.....	30 to 75
No. 50.....	65 to 95
No. 100.....	93 to 100

The above gradation represents the extreme limits which will be used in determining the suitability for use from all sources of supply. The gradation from any one source shall be reasonably uniform, and not subject to the extreme range of gradation specified above. For the purpose of determining

the degree of uniformity, a fineness modulus determinations shall be made upon representative samples, submitted by the Contractor, from such sources as the purposes to use. Fine aggregate from any one source, having a variation in fineness modulus greater than 0.20 either way from the fineness modulus of the representative sample submitted by the Contractor, may be rejected. Weighted percentage of loss shall be not more than 12 percent by weight when subjected to five cycles of the sodium sulfate soundness test in accordance with AASHTO T104.

- d. Miami Oolitic rock screenings, used as fine aggregate for normal Portland cement concrete and structural lightweight concrete, shall comply with AASHTO M6, Sections 6.1 and 7.1. Screenings shall be produced from rock having a loss not greater than 45 percent when subjected to the Los Angeles Abrasion Test Specific gravity(saturated, surface-dry) shall be at least 2.48.

C. Floor hardener:

- 1. Provide mineral or metallic hardener, natural gray in color.
- 2. Acceptable products:
 - a. "Lithochrome" by L.M. Scofield Company;
 - b. "Hydroment" by the Upco Company;
 - c. "Colorcron" or "Masterplate" by Master Builders;
 - d. "Harcot" or "Ferrolith H" by Sonneborn;
 - e. "Colorundum" or "Duraflex" by A.C. Horn Products.

D. Polyethylene vapor barrier membrane:

- 1. Provide polyethylene sheet for slab on grade of the thickness shown on the Drawings, complying with ASTM D2103.

PART 3: EXECUTION

3.01 FIELD QUALITY CONTROL:

- A. Concrete Sampling: Furnish concrete required for casting specimens and for the specified sampling and testing.
- B. Testing: The following testing will be performed by an independent testing laboratory retained and paid by the Contractor and approved by the Engineer.
 - 1. Slump and air content tests for each 50 cubic yards, or fraction thereof, placed.
 - 2. Yield tests, unit weight tests for each 200 cubic yards, or fraction thereof, placed or as deemed necessary by the Engineer.
 - 3. One set of five standard cylinders made and cured in accordance with ASTM C31 for each 50 cubic yards, or fraction thereof of concrete placed, for compressive strength testing.
- C. Tests: Sampled according to ASTM C172 and tested as follows:

1. Air content: ASTM C173.
2. Weight per cubic foot, yield, and air content and cement content: ASTM C138.
3. Slump: ASTM C143.
4. Compressive strength of cylindrical concrete specimens: ASTM C39.
5. Chloride content of the component concrete materials shall be determined following the Florida Department of Transportation Method for Determining Low-Levels of Chloride in Concrete and Raw Materials as outlined in FDOT Research Report No. 203 and FDOT Corrosion Report No. 78-1. No chloride contents are allowed in the concrete.

3.02 MIX EQUIPMENT:

A. Batching Plant:

1. Arrangement: Provide separate bins or compartments for each size or classification of aggregate and for each type of bulk Portland cement.
2. Compartments:
 - a. Provide compartments of ample size, constructed so that materials will be separated under working conditions. Equip the batching plant so that the flow of each material into its batcher is stopped automatically when the designated weight has been reached.
 - b. Weighing hoppers shall be constructed so as to eliminate accumulations of tare materials.
 - c. Weight aggregates in separate weight batches with individual scales, or cumulatively in one batcher on one scale. Weigh bulk cement on separate scale in a separate weight batcher.
 - d. Where mix water is measured by weight, do not weigh water cumulatively with another ingredient.
 - e. Interlock batching controls so that the charging mechanism cannot be opened until the scales have returned to zero. Satisfy these requirements by a semi-automatic batching system as defined in the Concrete Plant Standards of the Concrete Plant Manufacturer's Bureau, with interlocking as described herein, or by an automatic batching system as defined in the Concrete Plant Standards.
 - f. Provide facilities for obtaining representative samples of aggregate from each of the bins or compartments for test purposes.
3. Water batcher and admixture dispensers:
 - a. Provide equipment for batching water and admixtures at the batching plant, except in cases where the mixing has been authorized by the

Engineer to be performed at the job site in paving mixers or in truck mixers.

- b. Provide a device that is capable of measuring mixing water within the specified requirements for each batch. Provide mechanism for delivering water to the mixers so that leakage will not occur when the valves are closed.
- c. Interlock the filling and discharge valves for the water batcher so that the discharge valve cannot be opened before the filling valve is fully closed.
- d. Provide measuring devices for admixtures capable of ready adjustment to permit varying quantity of admixture to be batched. Interlock the dispenser for admixture with the batching and discharging operations so that the batching and discharging to the mixture will be automatic.
- e. If non-interlocked dispensers are permitted, check the calibration of the dispensers at intervals as required by the Engineer. Record the results of such calibration and make it available for the inspection of the Engineer.

4. Moisture content:

- a. At the time of batching, all aggregates shall be in a saturated surface-dry condition.
- b. In no event shall the free moisture content of the fine aggregate at the time of batching exceed eight percent of its saturated, surface-dry weight. The batch-to-batch uniformity of all aggregates shall be such that variations in moisture constant within one hour do not exceed twice this variation in a period of four hours.
- c. Install and maintain in operating condition an electrically actuated moisture meter which will indicate on a readily visible scale the percentage of moisture in the fine aggregate as it is batched, within a sensitivity of one-half of one percent by weight of the fine aggregate.

5. Use scales for proportioning of the springless dial type or the multiple beam type as follows:

- a. If scales are of the dial type, the dial shall be of such size and so arranged that it may be read easily from the operating platform.
- b. If of the multiple beam type, the scales shall be provided with an indicator operated by the main beam which will give positive visible evidence of over or under-weight. The indicator shall be so designed that it will operate during the addition of the last 200 pounds of any

weighing. The overtravel of the indicator hand shall be at least one-third of the loading travel. Indicators shall be enclosed against moisture and dust.

c. Accuracy of Scales.

1. Prior to beginning any work, all scales and other measuring devices used in batching shall be checked for accuracy by a County licensed scale technician. The scales shall be rechecked once every three months, or more often if deemed necessary.
2. A certificate of inspection, bearing the date of the certification and signed by the scale technician, shall be affixed to each measuring device.

6. Recorders:

- a. Provide an accurate recorder for producing a digital printout of the batch number and scale readings corresponding to each of the ingredients of each concrete batch, including zero initial readings. Indicate by name or code the individual ingredient corresponding to each weight. Indicate by pressure only, each admixture measured by volume.
- b. On each printout show date and time of batching, identification number identical to that of the concrete delivery ticket and codes for the mix design and for the project section.
- c. Prepare the printout in duplicate and deliver one copy with its corresponding concrete delivery ticket to the Engineer.
- d. House each recorder mechanism in a locked, dust-tight cabinet, in a position convenient for observation.

B. Concrete Mixers:

1. General requirements:

- a. Use mechanically operated batch mixers for mixing concrete, except that batches not exceeding one-third cubic yard may be hand mixed, or site mixed.
- b. Use concrete mixers of the revolving drum type or pan type. Use truck mixers of the revolving drum type. Replace the pick-up and throwover blades of revolving drum mixers when any part or section is worn one inch or more below the original dimensions of the manufacturer's design. A copy of the manufacturer's design, showing dimensions and arrangements of blades, shall be available to the Engineer. Batches shall be so charged into the mixer that some water will enter in advance of cement and aggregates. All water shall be in the drum by the end of

the first quarter of the specified mixing time.

2. On-site mixers:

- a. Accomplish on-site mixing in paving or stationary type mixers. Operate mixers at the speeds recommended by the mixer manufacturer, except that revolving drum mixers shall make not less than 14 nor more than 18 revolutions per minute.
- b. Operate paving and stationary mixers by an automatic timing device and discharge mechanism so that, during normal operation, no part of the batch will be discharged until the specified mixing time has elapsed. The total elapsed time between the intermingling of damp aggregates and the discharging of the completed mix from the mixer shall not be less than 60 seconds or more than 300 seconds. In order to produce a more homogeneous mixture the minimum allowable mixing time may be increased.

3.03 MIXING AND DELIVERY:

A. General:

Concrete placed quantities greater than two cubic yards shall be truck-mixed concrete, mixed and delivered in accordance with the requirements of ASTM C94. Concrete deposit shall be completed within 60 minutes after introduction of water to the mix, except that if a retardant is used such elapsed time shall not exceed 90 minutes.

- B. Site Mixing: Mixing of batches two cubic yards and more shall continue 60 seconds plus 15 seconds plus 5 seconds for each cubic yard in excess of two cubic yards. The mixing time may be reduced to a period of not less than 60 seconds if it is demonstrated to the satisfaction of the Engineer that a shorter mixing time results in satisfactory mixing. The mixer shall be operated at the drum speed as stipulated by the manufacturer of the mixer. Evidence of satisfactory mixing shall consist of the variation in slump of samples, taken from the first and last quarters of the discharge, being not more than 3/4 inch from the average of the two slump values.

END OF SECTION

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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

- A. ANSI/AWWA C104/A21.4: American National Standard for Cement-Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings for Water.
- B. ANSI/AWWA C105/A21.5: American National Standard for Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids.
- 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.
- D. ANSI/AWWA C111/A21.11: American National Standard for Rubber Gasket Joints for Ductile and Gray Iron Pressure Pipe and Fittings.
- E. ANSI/AWWA C115/A21.15: American National Standard for Flanged Ductile Iron and Gray Iron Pipe with Threaded Flanges.

- F. ANSI/AWWA C150/A21.50: American National Standard for the Thickness Design of Ductile Iron Pipe.
- G. ANSI/AWWA C151/A21.51: American National Standard for Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lines Molds, for Water or Other Liquids.
- H. ANSI/AWWA C600: American Water Works Association Standard for Installation of Ductile Iron Water Mains and Their Appurtenances.
- I. ANSI/AWWA C606: American Water Works Association Standard for Grooved End Pipe and Fittings
- J. ASME/ANSI B16.1: Cast Iron Pipe Flanges and Flanged Fittings, Class 125.
- 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 polyethylene lined in accordance with ANSI/AWWA C105/A21.5-88 or latest revision.
- 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.
- D. 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.
- E. 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.

$$L = 1.5PA(1 - \cos X)/fW$$

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 earth + W pipe + W water in pipe

W earth = (density of soil*) (depth of cover in feet) (O.D. in feet) (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 compiled 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

SECTION 15065

POLYVINYL CHLORIDE (PVC) WATER MAIN PIPE

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Furnish all labor, materials, equipment and incidentals required to install 4" through 24" PVC pressure mains, ductile iron fittings, and appurtenances as specified herein.

1.02 RELATED WORK

- A. Section 02221 Trenching, Beddings, and Backfill for Pipe
- B. Section 15062 Ductile Iron Pipe and Fittings
- C. Section 15100 Valves and Appurtenances

1.03 DESCRIPTION OF SYSTEMS

- A. PVC mains 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 types of PVC Pressure Mains (AWWA C900 and C905) and ductile iron fittings.

1.04 QUALIFICATIONS

- A. All of the PVC pipe and ductile-iron fittings shall be furnished by manufacturers who are fully experienced, reputable, and qualified in the manufacture of the materials to be furnished. The pipe and fittings shall be designed, constructed, and installed in accordance with AWWA Standards for PVC Pipe and using the best practices and methods as specified herein. The pipe manufacturer shall supply a one year warranty from date of shipment of their products. All pipes and fittings shall have NSF product certification and be U.L. product certified.

1.05 SUBMITTALS

- A. Submit to the Engineer within thirty (30) days after execution of the Contract a list of materials to be furnished, the names of the suppliers and the date of delivery of materials to the site.
- B. All PVC pipe and ductile-iron fittings to be installed under this Contract shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. Furnish to the Engineer in duplicate sworn certificates of such tests and their results. In addition, all PVC pipe and ductile iron fittings to be installed under this Contract may be inspected at the foundry for compliance with these Specifications by an independent testing laboratory selected by the City. The manufacturer's cooperation shall

be required in these inspections. The cost of foundry inspection requested by the City of all pipe approved for this contract will be borne by the City.

C. Shop Drawings shall be submitted to the Engineer for approval and shall include dimensioning, methods and locations of supports and all pertinent technical specifications for all piping to be furnished. Shop drawings shall be prepared by the pipe manufacturer.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. The PVC mains shall be unplasticized polyvinyl chloride (PVC) plastic pipe with integral bell containing a locked in ring and spigot joints.
- B. Pipe 4" through 12" shall meet the requirements of AWWA C900, "Polyvinyl Chloride (PVC) Pressure Pipe" and shall be Class 150 pipe meeting the requirements of DR18. Pipe 14" through 24" shall meet the requirements of AWWA C905 "PVC Water Transmission Pipe" and shall be Class 235 pipe meeting the requirements of DR-18.
- C. All pipe shall be suitable for use as a pressure conduit. Provisions must be made for expansion and contraction at each joint with an elastomeric ring. The bell shall consist of an integral wall section with a locked-in, solid cross section elastomeric ring which meets the requirements of ASTM D1869 and F-447. The bell section shall be designed to be at least as strong as the pipe wall and meet the requirements of AWWA C900 and C905. Sizes and dimensions shall be as shown in this specification.
- D. Standard laying lengths shall be 20 feet (+1") for all sizes. One hundred percent of the total footage of pipe of any class and size shall be furnished in standard lengths. Each standard length of pipe shall be factory tested to four times the class pressure of the pipe specified for a minimum of 5 seconds. The integral bell shall be tested with the pipe.
- E. Fittings for use with PVC water main pipe shall be ductile iron as specified under Section 15062.
- F. The manufacturer shall randomly select samples of pipe and test them in accordance with ASTM D1599 and shall withstand, without failure, pressure listed below when applied in 60-70 seconds. Class 100 shall have a minimum burst pressure of 535 psi at 73 F. Class 150 shall have a minimum burst pressure of 755 psi and Class 200 shall have a minimum burst pressure of 985 psi.
- G. Pipe shall withstand, without failure at 73 F, an impact of a falling missile, Type C, at the following levels, according to ASTM D2444.

<u>Pipe Size (in.)</u>	<u>Impact(Ft./Lbs.)</u>
4	100
6	100
8	100
10	120
12	120

- H. Pipe joints which are to be restrained, shall be harnessed with the "Meg-A-Lug" type joint restraint system for PVC pipe, the location and number of restrained joints are shown on the drawings.

PART 3 - EXECUTION

3.01 HANDLING PVC PIPE AND FITTINGS

- A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe. Pipe and fittings shall not be dropped. All pipe and fittings shall be examined before laying, and no piece shall be installed which is found to be defective. Any damage to the pipe shall be cause for rejection as directed by the Engineer.
- B. 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 City. 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 laid, shall conform to the lines and grades required.

3.02 LAYING PVC PIPE AND FITTINGS

- A. PVC pipe and ductile iron fittings shall be installed in accordance with requirements of AWWA Standard Specification except as otherwise provided herein. A firm, even bearing throughout the length of the pipe shall be constructed by tamping selected material at the sides of the pipe up to the springline. Blocking will not be permitted.
- 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 plug or other approved means. Good alignment shall be preserved in laying. The deflection at joints shall not exceed that recommended by manufacturer. Fittings, in addition to those planned, shall be provided, if required, in crossing utilities, which may be encountered upon opening the trench. Solid sleeves shall be used only where approved by the Engineer.
- C. When cutting pipe is required, the cutting shall be done by machines, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a compression joint shall be beveled to conform to the manufactured spigot end.
- D. Joining Pipe:
 - 1. 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.
 - 2. 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 Specification 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 the bolts. Bolts shall be tightened to the specified torques. Under no

condition shall extension wrenches or pipe over handle or ordinary ratchet wrench be used to secure greater leverage.

- E. All valves, fittings and other appurtenances needed upon the pipelines shall be set and jointed as indicated on the Drawings or as required by the manufacturer.
- F. Unless otherwise noted, underground fittings shall be mechanical joint with restraints as needed.
- G. If dewatering the trench is impossible due to unstable soil and groundwater conditions the Contractor may install the PVC Pipe underwater. If pipe is installed underwater bedding and haunching materials shall be approved by the Engineer before installing. PVC pipe is buoyant when installed underwater therefore, the Contractor shall take all precautions necessary to prevent pipe floatation by placing backfill material on the pipe as it is assembled or by other means acceptable to the Engineer.
- H. The Contractor shall install an electronic pipe detection device, i.e., "Detecto Tape" directly above the pipe during the backfilling operations. The brightly colored plastic-coated metal strips or tape shall be designed specifically for the purpose of pipe detection and shall include warning labels to the excavator.

3.03 PRESSURE AND LEAKAGE TESTS OF UNDERGROUND PRESSURE PIPING

- A. Hydrostatic pressure and leakage test shall conform with Section 4 of AWWA C600-77 Specification 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 100 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 of not less than 2 hours 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 pipelines shall be tested in such sections as may be directed by the Engineer by shutting valves or installing temporary plugs as required. The line shall be filled with water and all air removed and the test pressure shall be maintained in the pipe for the entire period by means of a force pump to be furnished by the Contractor. Accurate means shall be provided for measuring the water required to maintain 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 Standards for all pressure lines.
- E. The Contractor must submit his plans 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.

3.04 CLEANING AND FLUSHING

- A. The pipe shall be thoroughly cleaned of all foreign matter before installation. It is the 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 pipe is cleaned and if the groundwater level is above the pipe, or following a heavy rain 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.

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. Angle Meter
 - 11. Flanged Coupling
 - 12. Wall Sleeve
 - 13. Hydrants
 - 14. Concrete Meter Box
 - 15. Backflow Preventer
 - 16. Rubber Seat Ball Valves
 - 17. Air Release Valves
 - 18. Pressure Reducing Valves
 - 19. Water Pressure Gauge
 - 20. Solenoid Valves
 - 21. Butterfly Valves
 - 22. Tapping Sleeves and Valves
 - 23. Corporation Stops
 - 24. 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 tapered 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 hydro statically 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 cost 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.

END OF SECTION