CITY OF LAKE WORTH, FLORIDA

CITY OF LAKE WORTH
LS 1609 New Sanitary Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in Alley between B & C Street
IFB #16-118

CTA Project # 15-0006-001-04

July 2016

CITY OF LAKE WORTH
WATER UTILITIES ADMINISTRATION
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PROJECT: LS 1609 New Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in Alley between B and C Street

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DIVISION 0 – BIDDING AND CONTRACT REQUIREMENTS

PROJECT: LS 1609 New Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in Alley between B and C Street

Date: July 3, 2016

00020
INVITATION TO BID

Sealed bids, in duplicate, will be received by City of Lake Worth Procurement Office, City Hall, 2nd Floor, 7 North Dixie Highway, Lake Worth, Florida 33460 for the subject Project until:

3:00 P.M.	August 2, 2016
Time	Date

then opened publicly at that time. Such bids to provide for the furnishing of:

INVITATION TO BID NO.: IFB 16-118

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

Contract Documents may be obtained for bidding from DemandStar: www.demandstar.com. Contract Documents may also be obtained in electronic format on the City of Lake Worth website www.lakeworth.org/business/bids. All bidders must be a plan holder of record with DemandStar. Bids received by bidders that are not a plan holder of record with DemandStar will be returned unopened.

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

This Contract is a Unit Price contract.

All questions must be addressed in writing to Matthew Cigale (mcigale@craventhompson.com) and Kevin Menting (kmenting@craventhompson.com by July 26, 2016.

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

No Bid may be withdrawn for a period of 120 days after the scheduled closing date for the receipt of bids except as otherwise provided in Article 13 of the Instructions to Bidders.

The successful Bidder, who is awarded the Contract, shall be required to furnish a 100% Construction Performance Bond and a 100% Construction Payment Bond which meet the requirements of section 255.05, Florida Statutes.

The OWNER reserves the right to reject any or all Bids, to waive all nonmaterial irregularities, to re-advertise, and to cancel any invitation to bid when it is in the best interests of the City.

/s/ Corinne Elliott, Assistant Finance Director

Publish: Palm Beach Post -

00100
INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS.

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

2. COPIES OF BIDDING DOCUMENTS.

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

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

2.3. Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

3. QUALIFICATIONS OF BIDDERS.

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

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE.

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

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

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

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

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

Bidder may rely on any technical data contained in those reports and drawings specifically referenced in Division 1: General Requirements as technical data that can be relied on.

4.3. Information and data reflected in the Contract Documents with respect to Underground Facilities at or contiguous to the site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities or others, and Owner does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions.

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

4.5. Before submitting a Bid, each Bidder will, at Bidder's own expense, be responsible to make or obtain such examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

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

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

4.8. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA.

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

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

6. BID SECURITY.

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

6.2. The Bid security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within fifteen

days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of the Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the seventh day after the Effective Date of the Agreement or the 120th day after the Bid opening, whereupon Bid security furnished by such Bidders will be returned. Bid security with Bids which are not competitive will be returned within seven days after the Bid opening.

7. CONTRACT TIME.

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

8. LIQUIDATED DAMAGES.

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

9. SUBSTITUTE OR "OR-EQUAL" ITEMS.

The contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement. The procedure for submission of any such application by Contractor and consideration by Engineer is set forth in Paragraphs 6.7.1, 6.7.2 and 6.7.3 of the General Conditions and may be supplemented in Division 1: General Requirements.

10. SUBCONTRACTORS, SUPPLIERS AND OTHERS.

10.1. If the Bid Form or Specifications require (or if Owner requests after Bids are received) the identity of certain Subcontractors, Suppliers and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to Owner in advance of the specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within seven days after the Bid opening (or seven days after request by Owner) submit to Owner a list of all such Subcontractors, Suppliers and other persons and organizations proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, person or organization if requested by Owner. Subcontractors shall be required to meet Contractor's liability insurance requirements as established by the General and Supplementary Conditions or be listed as an additional insured on the apparent successful Bidder's policy. If Owner or Engineer after due investigation has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, either may before the Notice of Award is given request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid price. If apparent Successful Bidder declines to make any such substitution, Owner may award the contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, Supplier, other person or organization listed and to whom Owner or Engineer does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.8.2 of the General Conditions.

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

11. BID FORM.

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

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

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

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

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

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

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

12. SUBMISSION OF BIDS.

Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) and name and address of the Bidder and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or other delivery system the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED FOR LS 1609 New Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in alley between B & C Street TO BE OPENED at 3:00 pm August 2nd, 2016 " on the face of it.

13. MODIFICATION AND WITHDRAWAL OF BIDS.

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

13.2. If, within twenty-four hours after Bids are opened, any Bidder files a duly signed, written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid and the Bid security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract Documents.

14. OPENING OF BIDS.

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

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

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

15. BIDS TO REMAIN SUBJECT TO ACCEPTANCE.

All bids will remain subject to acceptance for _____120_ days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to that date.

16. AWARD OF CONTRACT.

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

16.2. In evaluating Bids, Owner will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

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

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

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

16.6. If the contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within _120_ days after the day of the Bid opening.

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

17. CONTRACT SECURITY.

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

18. SIGNING OF AGREEMENT.

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within ____15__ days thereafter Contractor shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds. In the event the successful Bidder fails to execute the Contract and return same to the Owner within the stipulated fifteen (15) days, the Owner may disqualify the Bid, and said Bidder shall not be permitted to contest to the contrary and does waive such right upon submitting a Bid.

19. DISQUALIFICATION OF BIDDER

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

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

20. LICENSES, PERMITS, AND CERTIFICATION

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

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

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

21. PREPARATION EXPENSE

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

22. NON-COLLUSION

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

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

23. CODE OF ETHICS

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

24. CONFLICT OF INTEREST

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

25. DRUG FREE WORKPLACE PROGRAMS

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

26. LEGAL REQUIREMENTS

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

27. COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT

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

28. NON-APPROPRIATIONS

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

29. FLORIDA PUBLIC RECORDS ACT AND CONTRACT CONTENT OWNERSHIP

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

bid and/or any resulting contract from the same. Disqualification of a Bidder does not eliminate this right.

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

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

END OF SECTION

BID FORM MUST BE SUBMITTED IN DUPLICATE

BIDDER: _____

PROJECT: LS 1609 New Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in Alley between B and C Street

DATE: _____
(Bid Submitted on)

00300
BID FORM

THIS BID IS SUBMITTED TO:

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 120 days after the day of Bid opening. BIDDER will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within 15 days after the date of OWNER's Notice of Award.

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

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

Date	Number
_____	_____
_____	_____
_____	_____

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

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

(d) BIDDER has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies (in addition to or to supplement those referred to in (c) above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as BIDDER considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract

Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by BIDDER for such purposes.

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

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

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

(h) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

4. BIDDER agrees to perform all the Work described in Contract Documents, subject to adjustments as provided therein, for the Prices BIDDER provides on the Unit Price Schedule (Page 00300– 5 thru 00300–7):

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

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

7. BIDDER agrees that the Work:

will be substantially complete within 180 calendar days after the date when the Contract Time commences to run as provided in paragraph 2.3 of the General Conditions, and completed and ready for final payment within 225 calendar days after the date when the Contract Time commences to run.

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

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

(a) Required Bid Security in the form of Performance and Payment Bond.

(b) Unit Price Schedule (Page(s) 00300-5 and 00300-7).

(c) Trench Safety Affidavit (Page(s) 00300-8).

(d) Schedule of Subcontractors (Page(s) 00300-9)

(e) Schedule of Suppliers, Equipment and Materials (Page(s) 00300-10)

(f) Sworn Statements Under Section 287.133(3)(a), Florida Statutes, on Public Entity Crimes (Page(s) 00300-11 and 00300-12).

(g) (List other documents as pertinent): Certification of Drug Free Workplace Program (Page(s) 00300-13).

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

The phone number and address of BIDDER indicated below.

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

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

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

13. BIDDER represents that it is financially solvent and sufficiently experienced and competent to provide all goods and services required under this IFB and that all information provided in the Bid is true and correct in all respects.

14. If BIDDER is:

An Individual

By _____(SEAL)
(Individual's Name)

_____
(Signature)

doing business as _____

Business address: _____

_____

Phone No. : _____

A Partnership

By_____ (SEAL)
(Firm Name)

_____
(General Partner) (Signature)

Business address:_____

_____

Phone No. : _____

A Corporation

By _____(SEAL)
(Corporation Name)

_____
(State of Incorporation)

By _____
(Name of Person Authorized to Sign)

_____
(Title)

_____
(Signature)

(Corporate Seal)

Attest _____
(Secretary)

_____
(Signature)

Business address: _____

_____

Phone No. : _____

UNIT PRICE SCHEDULE

All bid items shall include prices for furnishing, to the City, all materials, equipment, supplies, and all costs incurred in providing all work shown on the plans and specifications for City of Lake Worth Project #LS 1609 New Sanitary Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in alley between B & C Street. Said costs shall be complete and inclusive of all labor, permits, inspection, taxes, bond(s), insurance, miscellaneous costs, record drawings, warranty, overhead and profit.

Bid Item	Description	Qty.	Unit	Unit Price	Amount
1	Mobilization	1	LS		
2	Testing and Maintenance of Traffic and As-built Preparation	1	LS		
3	Environmental Protection Plan (NPDES & SWPPP)	1	LS		
	ROADWAY				
4	Type 'D' Curb Restoration	30	LF		
5	Furnish and Place Pavement Restoration	46	SY		
6	Mill Existing Roadway Pavement (1”)	125	SY		
7	Furnish and Install Asphaltic Concrete Overlay (1” Type S-III)	125	SY		
8	Furnish and Install Limerock Base, 6" (LBR 100)	890	SY		
9	Restoration of Concrete Sidewalks and Access Driveways (Min. 6" Thick)	32	SY		
10	Sod Restoration (in Right of Way)	335	SY		
11	Sod Restoration (On Private Property)	933	SY		
12	Remove and Dispose Existing Chainlink Fencing (4’ to 6’ in height)	32	LF		
13	Remove and Dispose of Existing Wood Fencing (5’ to 6’ in height)	53	LF		
14	Furnish and Install New Chainlink Fencing (4’ to 6’ in height)	105	LF		
15	Furnish and Install New Wood Fence (5’ to 6’ in height)	90	LF		
16	Remove and Re-place Existing Chainlink Fence on private property (4’ to 6’ in height)	116	LF		
17	Remove and Re-place Existing Wood Fence on private property (5’ to 6’ in height)	21	LF		
18	Furnish and Install 6” Chainlink Fence and Swing Gate (Lift Station)	88	LF		
	ROADWAY SUBTOTAL:				
	SANITARY SEWER				
19	Furnish and Install Pre-Cast Sanitary Sewer Maintenance Access Structure-4' Diameter (6'-8')	1	EA		
20	Furnish and Install Pre-Cast Sanitary Sewer Maintenance Access Structure-4' Diameter (10'-12')	1	EA		

Bid Item	Description	Qty.	Unit	Unit Price	Amount
	SANITARY SEWER				
21	Furnish and Install 8" P.V.C. (SDR-26) Sanitary Sewer Gravity Main Piping (6'-8')	210	LF		
22	Furnish and Install 8" P.V.C. (SDR-26) Sanitary Sewer Gravity Main Piping (8'-10')	148	LF		
23	Furnish and Install 8" P.V.C. (SDR-26) Sanitary Sewer Gravity Main Piping (10'-12')	21	LF		
24	Furnish and Install 6" Single Sanitary Sewer Lateral w/ cleanout	13	EA		
25	Furnish and Install 2" P.V.C. (Schedule 80) Force Main & Fittings	85	LF		
26	Core into Existing Sanitary Sewer Structure and Reconstruct Existing Flow Channels	1	EA		
27	Furnish and Install Pre-Fabricated Manufactured Odorless Pump Station (MOPS) or approved equal	1	EA		
	SANITARY SEWER SUBTOTAL:				
	WATER				
28	Furnish and Install Temporary 2" PVC Water Main and Water Services including connection to existing water meters	1	LS		
29	Furnish and Install Ductile Iron Pipe (D.I.P.) Water Main Pipe-4"	914	LF		
30	Furnish and Install Ductile Iron Water Fittings (Cement Lined)	1.00	TON		
31	Furnish and Install New 1" Single Water Service and connect to new or existing Water Meter/Box	25	EA		
32	Furnish and Install New 1" Double Water Service and connect to new or existing Water Meter/Box	2	EA		
33	Furnish and Install New Water Meter Box	17	EA		
34	Furnish and Install 4" Gate Valve W/ Box	5	EA		
35	Furnish and Install 12"x4" Tapping Sleeve and Valve	1	EA		
36	Connect to Existing Water Main	3	EA		
37	Remove and Dispose Existing 2" GS Water Main	945	LF		
38	Remove and Dispose Existing Meter Boxes	17	EA		

Bid Item	WATER	Qty.	Unit	Unit Price	Amount
39	Remove and Dispose Existing 2" Retired Gas Main	945	LF		
40	Furnish and Install Sample Point	6	EA		
41	Abandon and Cap Existing 2" Water Main	92	LF		
	WATER SUBTOTAL:				

Bid Item	PAVEMENT MARKING & SIGNAGE	Qty.	Unit	Unit Price	Amount
42	Furnish and Install Solid Traffic Stripe, Thermoplastic, (6") White	231	LF		
43	Furnish and Install Solid Traffic Stripe, Thermoplastic, (6") Yellow (Includes Double Yellow)	462	LF		
	PAVEMENT MARKING & SIGNAGE SUBTOTAL:				

Bid Item	LANDSCAPING	Qty.	Unit	Unit Price	Amount
44	Remove and Dispose Existing Tree, greater than 10" Diameter & Palms	2	EA		
45	Relocate Existing Trees and Palms onto private property as directed by Homeowner and Engineer	6	EA		
	LANDSCAPING SUBTOTAL:				

No.	Description	Qty.	Unit	Unit Price	Amount
	ALLOWANCES				
46	Optional Services Allowance	1	ALLOW	**$33,000.00**	**$33,000.00**
47	Permit Fee Allowance	1	ALLOW	**$2,500.00**	**$2,500.00**
		TOTAL BID PRICE:			

PROJECT NO: LS 1609 New Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in Alley between B and C Street

TRENCH SAFETY AFFIDAVIT

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

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

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

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

_____

(Signature) (date)

STATE OF _____

COUNTY OF _____

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

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

presented _____(type of identification) as identification.

_____ _____

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

SCHEDULE OF SUBCONTRACTORS

List Proposed Subcontractors	Category of Work

SCHEDULE OF EQUIPMENT AND MATERIALS

Description	Manufacturer	Model

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

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

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

   whose business address is _____

   _____

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

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

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

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

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

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

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

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

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

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

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

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

_____
[signature]

_____
[date]

STATE OF _____

COUNTY OF _____

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

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

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

CERTIFICATION OF DRUG FREE WORKPLACE PROGRAM

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

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

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

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

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

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

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

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

_____
Contractor’s Signature

BIDDERS'S QUALIFICATION QUESTIONAIRE

(Include in Bid Envelope)

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

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

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

_____

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

_____

1b. State the numbers of years your organization has been doing business as a Licensed General Contractor in Florida._____

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

_____

_____

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

_____

_____

_____

_____

4. BIDDER shall have successfully constructed, completed and certified, a minimum of one (1) mile worth of water main distribution and sanitary sewer gravity main within an existing residential neighborhood within the past 24 months. List these projects below (or attach).

Project #1 Name:_____

Contract Amount:_____

Owner: _____Phone No:_____

Consultant /Engineer _____Phone No._____

Owner Contact: _____Phone No._____

Description of Project:_____

Date Completed:_____

Contract Schedule (days):_____

Actual Completion Schedule:_____

Project #2 Name:_____

Contract Amount:_____

Owner: _____Phone No:_____

Consultant /Engineer _____Phone No._____

Owner Contact: _____Phone No._____

Description of Project:_____

Date Completed:_____

Contract Schedule (days):_____

Actual Completion Schedule:_____

Project #3 Name:_____

Contract Amount:_____

Owner: _____Phone No:_____

Consultant /Engineer _____Phone No._____

Owner Contact: _____Phone No._____

Description of Project:_____

Date Completed:_____

Contract Schedule (days):_____

Actual Completion Schedule:_____

Project #4 Name:_____

Contract Amount:_____

Owner: _____Phone No:_____

Consultant /Engineer _____Phone No._____

Owner Contact: _____Phone No._____

Description of Project:_____

Date Completed:_____

Contract Schedule (days):_____

Actual Completion Schedule:_____

Project #5 Name:_____

Contract Amount:_____

Owner: _____Phone No:_____

Consultant /Engineer _____Phone No._____

Owner Contact: _____Phone No._____

Description of Project:_____

Date Completed:_____

Contract Schedule (days):_____

Actual Completion Schedule:_____

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

   Project:_____

   Contract Schedule (days)_____

   Actual Completion Schedule (days)_____

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

   Project:_____

   LD Amount: _____

   LD Unit Price:_____

7. BIDDER shall demonstrate the proficiency in the performance of the following activities. Please provide specific experience with installation of water and sewer main over the past five years (started, underway and completed). Include the names and experience of subcontractors as applicable.

_____:_____

_____:_____

_____:_____

8. BIDDER shall specifically name proposed superintendents to be utilized on this project and identify years of experience completed by the proposed superintendents within the previous five years. It must be demonstrated that the experience is with the current bidder.

Name:_____

Position:_____

Years of Experience with BIDDER:_____

Type of Work Responsible For:_____

License:_____

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

10. Please attach copies of your most recent audited financial statement.

11. Bonding Capacity

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

(b) Please state your total bonding capacity._____

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

_____

_____

_____

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

_____

_____

_____

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

_____

_____

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

_____

_____

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

_____

_____

_____

_____

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

_____

_____

_____

_____

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

_____

(a) The business is a _____

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

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

_____

_____

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

Date_____

Bidder:_____

By:_____

Title:_____

Mailing Address:_____

_____

END OF BIDDER'S QUALIFICATION QUESTIONNAIRE

00500
AGREEMENT

THIS AGREEMENT is dated and will be effective on the _____ day of _____ in the year 2016, by and between the City of Lake Worth (hereinafter called OWNER) and __ _____ (hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK.

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

ARTICLE 2. ENGINEER

The Project has been designed by Craven Thompson & Associates, Inc., 3563 N.W. 53rd Street, Fort Lauderdale, FL 33309, who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3. CONTRACT TIME.

3.1. The Work will be substantially completed within 180 days from the date when the Contract Time commences to run as provided in paragraph 2.3 of the General Conditions and shall be finally complete and ready for final payment in accordance with paragraph 14.13 of the General Conditions within 225 days from the date when the Contract Time commences to run.

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

3.3. **LIQUIDATED DAMAGES. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER Five Hundred and 00/100 dollars ($ 500.00) for each day that expires after the time specified in paragraph 3.1 for Substantial Completion until the Work is substantially complete. After Substantial Completion if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER Five Hundred and 00/100 dollars ($500.00) for each day that expires after the time specified in paragraph 3.1 for completion and readiness for final payment.**

3.4 In the OWNER's sole discretion, a requested extension of time may be denied for delays resulting from normal weather conditions prevailing from normal weather conditions prevailing in the area as defined by the average of the last five (5) years of weather recorded or otherwise established by the OWNER.

ARTICLE 4. CONTRACT PRICE.

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

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

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

which is based on the unit price(s) in the Bid Form Unit Price Schedule for Unit Bid Items numbered _____1____ to _____47_____.

ARTICLE 5. PAYMENT PROCEDURES.

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

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

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

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

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

5.2. FINAL PAYMENT. Upon final completion and acceptance of the Work in accordance with paragraph 14.13 of the General Conditions, and settlement of all claims, including liquidated damages, if any, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said paragraph 14.13.

ARTICLE 6. (This Article left blank intentionally)

ARTICLE 7. CONTRACTOR'S REPRESENTATIONS.

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

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

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

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

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

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

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

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

ARTICLE 8. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire Agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

8.1. This Agreement consisting of 7 pages.

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

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

8.4. Notice of Award and Notice to Proceed.

8.5. General Conditions consisting of 72 pages.

8.6. Supplementary Conditions consisting of 10 pages.

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

8.8. Specifications as listed table of contents of the Project Manual.

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

8.10. Addenda numbers __ to ___, inclusive.

8.11. CONTRACTOR's Bid consisting of _____ pages.

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

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

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

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

8.16. Any other document attached hereto or incorporated herein.

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

ARTICLE 9. MISCELLANEOUS.

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

9.2. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent (except to the extend that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

9.3. OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

9.4. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replaced such stricken provision or part thereof with a valid and enforceable provisions that comes as close as possible to expressing the intention of the stricken provision.

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

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

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

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

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

9.10 The Contractor shall maintain adequate records to justify all charges, expenses, and costs incurred in estimating and performing the Work for at least five (5) years after final payment is made.

The Owner shall have access to such books, records, and documents as required for the purpose of inspection or audit during normal business hours at the Contractor's place of business. Under no circumstances will Contractor be required to disclose any confidential or proprietary information regarding its products and service costs.

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

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

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

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

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

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

ARTICLE 10. INDEMNIFICATION.

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

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

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

REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK
SIGNATURE PAGE FOLLOWS

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

CITY OF LAKE WORTH, FLORIDA

By: _____
Pam Triolo, Mayor

ATTEST

_____
Pamela J. Lopez, City Clerk

Approved as to form and legal sufficiency:

_____
Glen J. Torcivia, City Attorney

CONTRACTOR: _____

By: _____

Print Name: _____

Title: _____

[Corporate Seal]

STATE OF _____)
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, 2016 by_____, as _____ of _____, Inc., a Florida corporation, and who is personally known to me or who has produced the following _____ as identification.

Notary Public:

_____

PROJECT: LS 1609 New Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in Alley between B and C Street

00501
OPINION OF ATTORNEY

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

_____
Attorney for Owner

This the _____ day of _____, 20_____.

Construction Performance Bond

Bond Number:

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

---

CONTRACTOR (Name & Address):

SURETY (Name & Principal Place of Business):

OWNER (Name & Address):

City of Lake Worth
7 North Dixie Highway
Lake Worth, FL. 33460

CONTRUCTION CONTRACT
Date
Amount:
Description (Name & Location): LS 1609 New Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in Alley between B and C Street, City of Lake Worth, FL

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

CONTRACTOR AS PRINCIPAL
Company:

Signature:_____
Name & Title:

SURETY
Company:

Signature:_____
Name & Title:

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

1. The Contractor and the Surety, jointly and severally, bind themselves their heir; executors, administrators, successors and assigns to the owner to pay for labor. Materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.
2. 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 Surety at its address described in Paragraph 10 below, that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performance 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 be 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 compete the contract. Such Contactor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph 3.1: and
   3.3. The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.
4. When the Owner has satisfied the conditions of Paragraph 3. The Surety shall promptly and at the Surety's expense take one of the following actions:
   4.1. Arrange for the Contractor with consent of the Owner to perform and complete the Construction Contractor
   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 circumstances:
      1. After investigation determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined tender payment therefor to the Owner; or
      2. Deny liability in whole or in part and notify the Owner citing reasons therefor.
5. If the Surety does not proceed as provided in Paragraph 4 with reason-able promptness. The Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4. And the Owner refuses the payment tendered or the Surety has denied liability in whole or in part without further notice the Owner shall be entitled to enforce any remedy available to the Owner.
6. After the Owner has terminated the Contractor's right to complete the Construction Contract and if the Surety elects to act under Subparagraph 4.1. 4.2. or 4.3. above then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract the Surety is obligated without Duplication for:
   6.1. The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract:
   6.2. Additional legal including appellate proceedings, design professional and delay costs and expenses resulting from the Contractor's default, and 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 Contractor.
7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heir's 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 obligation.
9. Any proceeding, legal or equitable under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contactor Default or within two years after the Contactor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.
11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted 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.
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.

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

(FOR INFORMATION ONLY- Name, Address and Telephone)

AGENT OR BROKER:

OWNER'S REPRESENTATIVE (ENGINEER):

Craven Thompson & Associates, INC.
3563 N.W. 53rd Street
Fort Lauderdale, Florida 33309

Construction Payment Bond

Bond Number:

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

CONTRACTOR (Name & Address):

SURETY (Name & Principal Place of Business):

OWNER (Name & Address):

City of Lake Worth
7 North Dixie Highway
Lake Worth, FL. 33460

CONTRUCTION CONTRACT
Date
Amount:
Description (Name & Location): LS 1609 New Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in Alley between B and C Street, City of Lake Worth, FL

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

CONTRACTOR AS PRINCIPAL
Company:

Signature: _____
Name & Title:

SURETY
Company:

Signature: _____
Name & Title:

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

1. The Contractor and the Surety, jointly and severally, bind themselves their heir; executors, administrators, successors and assigns to the owner to pay for labor. Materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.
2. With respect to the Owner, this obligation shall be null and void if the Contractor:
   2.1. Promptly makes payment, directly or indirectly for all sums due Claimants and
   2.2. Defends indemnifies and holds harmless the Owner from all claims demands liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of 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 to the Contractor and the Surety and provided there is no Owner Default.
3. With respect to Claimants this obligation shall be null and void if the Contractor promptly makes payment directly or indirectly for all sums due.
4. The Surety shall have no obligation to Claimants under this Bond until:
   4.1 Claimants who are employed by or have a direct contact with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy or notice thereof to the Owner stating that a claim is being made under this Bond and with substantial accuracy the amount of the claim (see note one)
   4.2 Claimants who do not have a direct contract with the Contractor
      1. Have furnished written notice to the Contractor and sent a copy or notice thereof, to the Owner within 90 days after having last preformed 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 preformed and
      2. Have either received a rejection in whole or in part from the Contractor or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly and
      3. Not having been paid within the above 30 days have sent a written notice to the Surely (at address described in Paragraph 12) and sent a copy or notice thereof to the Owner stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor
5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety that is sufficient compliance.
6. When the Claimant has satisfied the conditions of Paragraph 4 the Surety shall promptly and at the Surety's expense take the following actions:
   6.1. Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
   6.2 Pay or arrange for payment of any undisputed amounts of this Bond, and the amount of this Bond shall be credited for any payment made in good faith by the Surety.
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 expense of any Claimant under this Bond and shall have under this Bond no obligations to make payments to give notice on behalf of or otherwise have obligations to Claimants under this Bond.
10. The Surety hereby waives notice of any change, including changes at time to the Construction Contract or to related subcontracts purchase orders and other obligations.
11. No Suit or actions shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of 2 year from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2 (iii) , or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
12. Notice to the Surety the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety the Owner or the Contractor however accomplished shall be sufficient compliance as of the date received at the address shown on the signature page.
13. When this Bond has been furnished to comply with statutory or other legal requirements 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 constructed 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 to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms " labor materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor materials or equipment were furnished.
   15.2. Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
   15.3. Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

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

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

(FOR INFORMATION ONLY- Name, Address and Telephone)

AGENT OR BROKER:

OWNER'S REPRESENTATIVE (ENGINEER):

Craven Thompson & Associates, INC.
3563 N.W. 53rd Street
Fort Lauderdale, Florida 33309

SECTION 00630
NOTICE OF COMPLIANCE WITH CHAPTER 556, FLORIDA STATUTES

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

Executed this _____ day of _____, 20____.

_____
(name of Contractor)

_____
(signature)

_____
(print name)

_____
(title)

END OF SECTION

00670
CONTRACTOR'S AFFIDAVIT TO OWNER

STATE OF FLORIDA
COUNTY OF _____

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

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

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

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

NAME OF LIENOR	AMOUNT DUE AND UNPAID
	$

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

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

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

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

Signed and sealed in the presence of:

_____ _____
(ENTITY)
_____ By:_____
(SEAL)

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

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

00680
APPLICATION FOR PAYMENT NO. _____

Project: LS 1609 New Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in Alley between B and C Street

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

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

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

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

Dated _____, 20____

_____
Contractor and Mailing Address

By _____
(Name and Title)

State of)
County of)ss

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

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

Payment of the above AMOUNT DUE THIS APPLICATION is recommended.

Craven Thompson & Associates, Inc.

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

CITY OF LAKE WORTH

Date: _____ By_____
(Name) (Title)

00681
SCHEDULE OF VALUES AND WORK COMPLETED

PROJECT TITLELS 1609 New Gravity Sewer Installation and Water Main Re-placement from 10th to 12th Avenue South in Alley between B and C Street

_____

CONTRACTOR _____

FOR PERIOD ENDING _____

TO ACCOMPANY APPLICATION NO. _____

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

TOTAL WORK TO DATE $_____

MATERIALS SUITABLY STORED

NOTE: CONTRACTOR TO ITEMIZE AND ATTACH APPROPRIATE INVOICES

TOTAL MATERIAL SUITABLY STORED $_____

Accompanying Documentation (Contractor to itemize):

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

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

EJCDC®

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Issued and Published Jointly by

ACEC

AMERICAN COUNCIL OF ENGINEERING COMPANIES

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. 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, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

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. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document 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, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

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has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Engineer*—The individual or entity named as such in the Agreement.

21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

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

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24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.

26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

27. *Notice to Proceed*—A written notice 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.

28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

29. *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.

30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.

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

34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.

35. *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.

36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

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37. *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, and such other lands furnished by Owner which are designated for the use of Contractor.

38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

39. *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.

40. *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.

41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.

42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, 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 a Subcontractor.

44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.

45. *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 but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

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

47. *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; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

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48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

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

B. *Intent of Certain Terms or Adjectives*:

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 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 15.03 or 15.04).

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.

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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. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

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

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Bonds*: 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 Contractor's Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.

C. *Evidence of Owner's Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), 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;

2. a preliminary Schedule of Submittals; and

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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.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

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

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

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

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

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computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, 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.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, 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, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract 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, reference standard, 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 part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*:

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

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error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*:

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

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

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

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3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

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

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *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 Contract 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 Contract. 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 Contract, whichever date is earlier.

4.02 *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 such date.

4.03 *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.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 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 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

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2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.

B. 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, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, 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 Times and Contract Price. 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.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. 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. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. abnormal weather conditions;

3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and

4. acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

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G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *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.

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 permanent improvements are to be made 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.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*:

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all 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 directly or indirectly, in whole or in part

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by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent 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 and adjacent areas 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 of 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 structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

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

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

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

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5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site 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 5.03 is materially inaccurate; or

2. is of such a nature as to require a change in the Drawings or Specifications; 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 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, 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 fall within any one or more of the categories described in Paragraph 5.04.A;

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 Paragraph 13.03; and,

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c. 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.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a 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 otherwise; or

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

c. Contractor failed to give the written notice as required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent 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 do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and

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

a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;

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

d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

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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 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

C. *Engineer's Review*: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

   a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;

   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 Paragraph 13.03;

   c. 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; and

   d. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

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5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

2. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

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

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

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

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

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F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. 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, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.

H. 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, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

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ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, 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. 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 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then 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 bond and surety requirements above.

E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

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maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, 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.

G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.

H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.

J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:

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

2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).

3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

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4. Foreign voluntary worker compensation (if applicable).

B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:

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

2. claims for damages insured by reasonably available personal injury liability coverage.

3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

C. *Commercial General Liability—Form and Content*: Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage:

   a. Such insurance shall be maintained for three years after final payment.

   b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

3. Broad form property damage coverage.

4. Severability of interest.

5. Underground, explosion, and collapse coverage.

6. Personal injury coverage.

7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.

8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

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of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.

H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:

1. include at least the specific coverages provided in this Article.
2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
5. be appropriate for the Work being performed and provide protection from claims that 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.

J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

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6.04 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, 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.

B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable 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 Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."

2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

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

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5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
6. extend to cover damage or loss to insured property while in transit.
7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
8. allow for the waiver of the insurer's subrogation rights, as set forth below.
9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
10. not include a co-insurance clause.
11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
12. include performance/hot testing and start-up.
13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.

B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.

F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

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6.06 *Waiver of Rights*

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, 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 insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

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

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

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.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, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.

D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

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policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *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.

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.

7.02 *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, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

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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.

7.04 *"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 Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item 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 is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

1. If Engineer in its sole discretion determines that 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, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, 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

4) it is not objectionable to Owner.

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.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

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D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. 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:

a. shall certify that the proposed substitute item will:

1) perform adequately the functions and achieve the results called for by the general design,

2) be similar in substance to that specified, and

3) be suited to the same use as that specified.

b. will state:

1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,

2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

c. will identify:

1) all variations of the proposed substitute item from that specified, and

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2) available engineering, sales, maintenance, repair, and replacement services.

d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

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

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.

B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

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E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. 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 the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. 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.

J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.

L. 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.

M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.

N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

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O. Nothing in the Contract Documents:

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

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

7.07 *Patent Fees and Royalties*

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

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

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

7.08 *Permits*

A. Unless otherwise provided in the Contract Documents, 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 the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

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7.09 *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.

7.10 *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 or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

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

7.12 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

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

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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, other work in progress, 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 Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.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 at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and protection 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 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *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.

7.14 *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

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exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *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.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements*:

1. Before submitting a Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

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

c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the 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 set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings*:

a. Contractor shall submit the number of copies required in the Specifications.

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

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provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples*:

   a. Contractor shall submit the number of Samples required in the Specifications.

   b. Contractor shall 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 7.16.D.

3. 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. *Other Submittals*: Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

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 or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample 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 7.16.A.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 will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

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8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

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.

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on 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;

6. the issuance of a notice of acceptability by Engineer;

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

8. any correction of defective Work by Owner.

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D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

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

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.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 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

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

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

7.19 *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 Laws and Regulations.

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, and other submittals prepared by such professional. Shop

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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, 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 7.16.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, 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.

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8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
2. an itemization of the specific matters to be covered by such authority and responsibility; and
3. the extent of such authority and responsibilities.

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

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. 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.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

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D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all 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 damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

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

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

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9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *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.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *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.

10.02 *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 10.08. Particularly, but without limitation, during

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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.

10.03 *Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. 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.

10.04 *Rejecting Defective Work*

A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.

B. 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, are set forth in Paragraph 7.19.

C. Engineer's authority as to Change Orders is set forth in Article 11.

D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

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

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, 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.

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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 15.06.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 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

1. *Change Orders*:

a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

2. *Work Change Directives*: A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

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adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes 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. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-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. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *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, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.

B. 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, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

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the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

C. *Contractor's Fee*: When applicable, 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 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

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 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.

B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

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the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures*: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action*: Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

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

1. 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;

2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

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B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*:

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

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submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

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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 13.01.

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

5. Supplemental costs including the following:

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

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

    d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

    e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

    f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

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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 communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here 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 Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole 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, Change Proposal, Claim, set-off, or other 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 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, 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.

13.02 *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.

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B. *Cash Allowances*: Contractor agrees that:

1. 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

2. 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*: 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.

13.03 *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. Payments to Contractor for Unit Price Work will be based on actual quantities.

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. 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 the following paragraph.

E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price 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;

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

3. Contractor believes that it 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.

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ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

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

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

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, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

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cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

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B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then 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, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages 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 pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. 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, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *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, then 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.

14.07 *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, 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, then 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 14.07, 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, 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 incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

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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 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 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 during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *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, a warehouse bond, 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.

C. *Review of Applications*:

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

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

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a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

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

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

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

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

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

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

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

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

   d. to make any examination to ascertain how or for what purposes Contractor has used the money 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 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

   a. the Work is defective, requiring correction or replacement;

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

   c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

   d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

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e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*:

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. the Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

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

i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;

j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. 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;

l. there are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

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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, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *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 and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

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

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

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

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E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

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. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

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

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 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 6.05 regarding builder's risk or other property insurance.

15.05 *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, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *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

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inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

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

   a. all documentation called for in the Contract Documents;

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

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all disputes that Contractor believes are unsettled; and

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

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

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 have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. 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 15.07. 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. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

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including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *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 Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;
2. correct such defective Work;
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 to other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. 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 repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

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

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

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E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *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 written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and 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);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, 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 complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.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 the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

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and damages exceeds 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.

F. 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, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *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; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

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

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) 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 16.03.

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 are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

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expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this Article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this Article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *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, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

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

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract 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.

18.03 *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. 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.

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18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Headings*

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

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SUPPLEMENTARY CONDITIONS

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

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

PART 1 - MODIFICATIONS AND SUPPLEMENTS TO GENERAL CONDITIONS

SC-1

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

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

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

COMMENCEMENT OF CONTRACT TIME; NOTICE TO PROCEED:

SC-2.3

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

In no event will the Contract Time commence to run later than the __120th__ day after the date of the Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier, (unless agreed otherwise by Owner and Contractor in writing).

BEFORE STARTING CONSTRUCTION:

SC-2.7

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

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

PHYSICAL CONDITIONS:

SC-4.2.1.

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

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

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

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

PAYMENT AND PERFORMANCE BONDS

SC-5.1

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

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

CONTRACTOR'S LIABILITY INSURANCE:

SC-5.3.

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

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

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

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

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

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

Property Damage:

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

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

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

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

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

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

5.3.8. Umbrella Excess Liability Insurance:

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

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

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

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

CONTRACTUAL LIABILITY INSURANCE:

SC-5.4.

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

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

OWNER'S LIABILITY INSURANCE:

SC-5.5.

Delete paragraph 5.5 of the General Conditions in its entirety.

PROPERTY INSURANCE:

SC-5.6.

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

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

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

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

SC-5.7.

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

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

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

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

SC-5.8.

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

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

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

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

SC-5.9.

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

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

Contractor, Subcontractor or others suffering any such loss and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

SC-5.10.

Delete paragraph 5.10 of the General Conditions in its entirety.

ACCEPTANCE OF INSURANCE:

SC-5.14.

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

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

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

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

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

CONCERNING SUBCONTRACTORS, SUPPLIERS AND OTHERS:

SC-6.8.3.

Add the following paragraph to the General Conditions:

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

SC-6.9.

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

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

SC-6.13

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

Contractor shall obtain and pay for the following permits:

1. City of Lake Worth Building (Electrical and Plumbing) Permit related to pump station electrical components and water services installed after water meter. An allowance item is provided within unit price schedule to cover building permit fee.
2. Any other permits as applicable.

INDEMNIFICATION

SC-6.30

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

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

SC-6.31

Delete paragraph 6.31 of the General Conditions in its entirety.

PROJECT REPRESENTATION:

SC-9.3.1.

Add the following paragraph to the General Conditions:

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

REJECTING DEFECTIVE WORK

SC-9.6

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

ENGINEER will also have authority to disapprove or reject Work which ENGINEER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

UNIT PRICE WORK

SC-11.9.3.

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

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

WARRANTY AND GUARANTEE:

SC-13.1.

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

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

TESTS AND INSPECTIONS:

SC-13.3.

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

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

ONE YEAR CORRECTION PERIOD

SC-13.12

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

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

FINAL PAYMENT AND ACCEPTANCE

SC-14.13

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

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

TERMINATION OF AGREEMENT

SC-15.4

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

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

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

SC-16.

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

MISCELLANEOUS PROVISIONS

SC-18

Add Article 18 as follows:

SC-18.1

Controlling Law and Venue.

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

SC-18.2

Headings.

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

SC-18.3

Inspector General.

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

SC-18.4

Enforcement Costs.

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

SC-18.5

Waiver.

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

SC-18.6

Jury Trial.

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

SC-18.7

Independent Contractor.

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

SC-18.8

Access and Audits.

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

SC-18.9

Time.

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

SC-18.10

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

SC-18.11

Representation and Binding Authority.

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

SC-19

Add Article 19 as follows:

NO DAMAGES FOR DELAY

SC-19

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

Contractor shall be entitled only to extensions of the Contract Time as the sole and exclusive remedy for such resulting delays, in accordance with and to the extent specifically provided herein.

PART 2 - ADDITIONAL SUPPLEMENTARY CONDITIONS

1. ATTACHMENTS:

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

a. Construction Performance Bond (00610).

b. Construction Payment Bond (00620).

c. Notice of Compliance with Chapter 556, Florida Statutes (00630).

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

e. Form of Application for Payment (00680).

f. This space left blank intentionally.

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

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

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

END OF SECTION

00820
SPECIAL CONDITIONS

CITY OF LAKE WORTH PURCHASING DEPARTMENT REQUIREMENTS

SPC-1 APPROVAL OF ACCOUNTING SYSTEM

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

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

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

SPC-2 RIGHT TO INSPECT PLANT

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

SPC-3 RIGHT TO AUDIT RECORDS

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

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

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

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

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

SPC-4 LOCAL VENDOR PREFERENCE

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

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

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

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

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

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

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

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

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

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

SPC-6 APPROPRIATION OF FUNDS

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

SPC-7 BUILDING PERMIT FEE

A building permit fee allowance is provided within unit price schedule. See Supplemental Conditions paragraph SC-6.13 for further details.

SPC-8 CONE OF SILENCE

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

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 PROJECT

A. This Project consists of:

- The base bid consists of Water Main re-placement, new Sanitary Sewer, and Roadway Restoration, preparation and implementation of Maintenance of traffic Plan(s), coordination with franchise utilities and all else necessary for a complete and functional project that meets or exceeds all requirements of the City of Lake Worth Public Services and Utility Department.

Pursuant to the installation of the Infrastructure Improvements located both in the public Right-of-Way and private property, including landscaping, driveways, pavement, curbing, sidewalks, fences and other miscellaneous items, shall be restored to their original condition or better.

This Projects Construction Improvements are indicated on the Plans, Details, Specifications and Contract Documents for this project.

1.02 WORK DESCRIPTION

A. Civil Work:

Civil work includes, but is not limited to; mobilization, maintenance of traffic, utility locations, site clearing, earthwork, potable water line installation/construction, water services, sanitary sewer main and manhole installation/construction, sanitary sewer lift station installation, roadway restoration, curb and gutter restoration, and sidewalk restoration along with incidental work and items necessary to complete the project as shown on the Drawings and specified.

1.03 GOVERNING STANDARDS

A. In carrying out the Work, CONTRACTOR shall comply with all basic materials and construction requirements as shown on the Drawing and specified herein and with all notes and details shown on the Drawings, with Schedules, Supplemental Specifications, Technical Specifications, and specific requirements relating to construction activities.

1.04 COMPENSATION

A. The CONTRACTOR's compensation for providing all labor, materials, equipment and performing all construction and installation as shown on the Drawings and included in the Specifications will be in accordance with the provisions of Section 01024 herein.

END OF SECTION 01010

SECTION 01024

MEASUREMENT AND PAYMENT

1.01 GENERAL

A. The CONTRACTOR shall receive and accept the compensation provided in the Proposal and Contract as full payment for furnishing all materials, labor, tools and equipment, for performing all operations necessary to complete the work under the Contract, and also in full payment for all loss or damages arising from the nature of the work, or from the action of the elements or from any unforeseen difficulties that may be encountered during the prosecution of the work until final acceptance by the CITY.

B. Payment for the various items of the Bid Schedule shall constitute full compensation for CONTRACTOR's superintendent at the job site full-time during furnishing and installing all components of the proposed infrastructure improvements including but not limited to furnishing and installing all pipe and structures` complete in place including but not limited to bends, tees, outlets, fittings, blind flanges and specials, including connections to existing pipelines shown on the Drawings; including surveying both horizontal and vertical control for construction of the structures, pipeline and appurtenances; including all earthwork, trench excavation as shown on the Drawings, removal and disposal of waste, unsuitable and excess material, furnishing and installing pipe bedding material, all backfill and compaction of native material, and dewatering as required; including potholing to verify locations of existing utilities in advance of construction; the restoration of interfering portions of existing service and utility lines that are not included in other bid items and shown on the Drawings, restraint of pipe shown the on the Drawings and grouting of pipe joints; including providing the water for pressure testing; furnishing, installation, and removal of test heads, cleanup, and restoration of all improvements incidental to construction for which there are no other bid items; including but not limited to, sprinkler systems, drainage systems, guardrails, landscaping, fences, curbs and gutters, and all other work not included in other bid items.

C. The prices stated in the proposal include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the Drawings and specified herein. The basis of payment for an item at the price shown in the proposal shall be in accordance with the description of that item in this Section.

D. The CONTRACTOR's attention is called to the fact that the quotations for the various items of work are intended to establish a total price for completing the work in its entirety. Should the CONTRACTOR determine that the Proposal or list of Bid Items has not established a price for some item of work; the CONTRACTOR shall include that work in some other applicable Bid Item, so that the Proposal for the project reflects the CONTRACTOR’s total price for completing the work in its entirety.

E. CONTRACTOR is advised that bid items may be deleted if not required. No compensation will be made for deleted/not used bid items.

1.02 MOBILIZATION (Bid Item No. 1)

A. Description.

Perform preparatory work and operations in mobilizing for beginning work on the project, including, but not limited to, bonds and insurance, those operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site and for the establishment of temporary offices, buildings, safety equipment and first aid supplies, and sanitary and other facilities. Include any other preconstruction expense, including pre construction videography, protection of existing trees with tree barricade, issue/provide door hangers to affected residents in order to make them aware of proposed construction activities, coordination with franchise utilities including holding of utility poles during construction, necessary for the start of the work, excluding the cost of construction materials.

B. Basis of Payment.

The work and incidental costs specified as being covered under this Section will be paid for at the Contract lump sum price for the item of Mobilization.

C. Mobilization Payments:

The pay item for Mobilization will be made in partial payments in accordance with the following:

Percent of Original Contract Amount Earned	Allowable Percent of the Lump Sum Price for the Item*
5%	25%
10%	50%
25%	75%
50%	100%

*Mobilization pay item will be limited to 10% of the original Contract amount for the project. Any remaining amount will be paid upon completion of all work on the project.

The standard retainage will be applied to these allowances. Partial payments made on this item will in no way act to preclude or limit any of the provisions for partial payments otherwise provided for by the Contract.

As an exception to partial payments being made based on Percent of Original Contract Amount Earned, the CITY will pay the CONTRACTOR the invoice price of the Contract Bond when the Engineer has been furnished with a certified copy of the invoice from the Bonding Company. No other work will be required to receive payment for the Contract Bond included in the bid price for Mobilization.

1.03 TESTING AND MAINTENANCE OF TRAFFIC AND AS-BUILT PREPARATION (Bid Item No. 2)

A. See Maintenance of Traffic Section 01570, and all other references to traffic control in this document and any regulatory requirements. See Testing Laboratory Services Section 01410.

B. Lump sum price named in the Bid Schedule shall include the preparation and processing of Maintenance of Traffic Plans for City of Lake Worth and installation thereafter, including a Florida Licensed Professional Traffic Engineer preparing the MOT plans. Maintenance of Traffic within City of Lake Worth right of way shall be for night time closure only (9 pm to 7 am) Sunday through Thursday. No lane closures during Holiday periods.

C. Payment for testing and maintenance of traffic will be made at the lump sum price named in the Bid Schedule. Payment for testing and maintenance of traffic will be made in equal monthly amounts during the duration of the contract time and shall also include preparation of as-builts (refer to General Notes and Specifications-Engineers As-built Requirements).

1.04 ENVIRONMENTAL PROTECTION PLAN (NPDES & SWPPP) (Bid Item No. 3)

A. Measurement for payment for implementation of the Environmental Protection Plan, which includes NPDES and SWPPP requirements, will be based on the preparation and implementation of the plan during the duration of the project.

B. Payment for implementation of the Environmental Protection Plan maintenance will be made at the lump sum price named in the Bid Schedule. Payment for preparation and implementation of the Environmental Protection Plan will be made in equal monthly amounts during the duration of the original contractual Substantial Completion contract time. This item shall include preparing Stormwater Prevention Pollution Plan (SWPPP) and implementation of best management practices (BMP) and environmental pollution protection throughout construction including but not limited to silt fences, temporary stabilized gravel construction entrance(s), concrete wash down area(s), sandbags, straw bales, gutterbuddies adjacent to existing and proposed curb inlets, drainage structure/inlet protection, and turbidity barriers.

1.05 TYPE “D” CURB RESTORATION (Bid Item No. 4)

A. Measurement for payment for Type “D” curb restoration will be based upon the actual number in liner feet of such curb actually restored as determined by measurement along the centerline of the curb in place, all in accordance with the requirements of the Contract Documents.

B. Payment for Type “D” curb restoration will be made at the unit price per linear foot named in the Bid Schedule, which price shall constitute full compensation for complete restoration including grading, forming, saw cutting of pavement, drop curb, removal and disposal of

existing curb and gutter/drop curb, and cleanup of all areas disturbed by this construction.

1.06 FURNISH AND PLACE PAVEMENT RESTORATION (Bid Item No. 5)

A. Measurement for payment for pavement restoration will be based upon the actual number of square yards of pavement area restored, all in accordance with the requirements of the Contract Documents.

B. Payment for pavement restoration will be made at the unit price per square yard named in the Bid Schedule, which price shall constitute full compensation for furnishing and placement of LBR 40 stabilized subgrade, LBR 100 limerock base (12" minimum thickness), first and second lift of asphalt (min. two (2)-one inch (1") Type S-III asphalt lifts), tack coat, applying prime coat and furnishing all such material, and asphalt for full lane width to complete to the cross-section and thickness as shown in the Contract Documents including excavation, grading, importing material, transportation, handling, cleaning, positioning, compacting of limerock base to LBR 100 and subgrade to LBR 40, night work, densities passed, removal and disposal of all necessary pavement, base material, subgrade and installation of temporary asphalt as deemed necessary by the CITY.

1.07 MILL EXISTING ROADWAY PAVEMENT (Bid Item No. 6)

A. Measurement for payment of milling of existing pavement will be based upon the number of square yards of such existing pavement actually milled, as detailed in the DRAWINGS, all in accordance with the requirements of the Contract Documents.

B. Payment for milling of existing pavement at the depth indicated will be made at the unit price per square yard for such milling as named and at the thickness indicated in the Bid Schedule which price will constitute full compensation milling, removal of milled material, complete in place to the cross section and depth shown on the DRAWINGS; including night work, restoration of traffic loop detectors, temporary pavement markings, and saw cutting of all pavement and all cleanup of the area disturbed by this construction.

1.08 FURNISH AND INSTALL ASPHALTIC CONCRETE OVERLAY (Bid Item No. 7)

A. Measurement for payment of for furnishing and installing asphalt concrete pavement overlay will be based upon the number of square yards of such asphalt concrete pavement actually constructed, as detailed in the DRAWINGS, all in accordance with the requirements of the Contract Documents.

B. Payment for placement of asphalt concrete pavement overlay at the thickness indicated will be made at the unit price per square yard for such placement as named and at the thickness indicated in the Bid Schedule which price will constitute full compensation for applying a tack coat and furnishing, placing and compacting all asphalt surface (including asphalt overlay), complete in place to the cross section and thickness shown on the DRAWINGS; including night work, restoration of traffic loop detectors, installation of new thermoplastic pavement markings (temporary), milling and saw cutting of all pavement and all cleanup of the area disturbed by this construction.

1.09 FURNISH AND PLACE LIMEROCK BASE (Bid Item No. 8)

A. Measurement for payment for furnishing and placing lime rock base material will be based upon the number of square yards of such materials actually compacted in place at the depth indicated, densities passed, and primed all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and placing of lime rock base material will be made at the unit price per square yard at the depth indicted and named in the Bid Schedule, which price shall constitute full compensation for applying prime coat and furnishing all such material, in place, including all excavation, transportation, handling, cleaning, positioning, compacting subgrade to 98% of max density per A.A.S.T.H.O. T-180, and compacting of limerock base to LBR 100 and disposal of waste or unsuitable material.

1.10 RESTORATION OF CONCRETE SIDEWALKS AND ACCESS DRIVEWAYS (Bid Item No. 9)

A. Measurement for payment for restoration of sidewalks and driveways will be based upon the actual number of square yards of such Concrete sidewalks and driveways restored, all in accordance with the requirements of the Contract Documents.

B. Payment for restoration of concrete sidewalks and driveways will be made at the unit price per square yard named in the Bid Schedule which price shall constitute full compensation for completing said WORK, including all removal and disposal of existing material, earthwork, grading, base compaction, construction of the driveway to the same depth and material as the existing one (6" min. concrete thickness), base material, sand, furnishing and setting for expansion joint material, disposal of excess material, and densities passed.

1.11 SOD RESTORATION (Bid Item No. 10 & 11)

A. Measurement for payment of sod restoration will be based upon the actual number of square yards actually restored, all in accordance with the requirements of the Contract Documents.

B. Payment for sod restoration will be made at the unit price per square yard named in the Bid Schedule which price shall constitute full compensation for completing said work including but not limited to the removal and disposal of existing sod, installing new sod, Bahia or St. Augustine, restoration of irrigation systems, earthwork, clearing, grading (including side slope and berm re-grading), coordination with city and homeowner, and disposal of excess material in accordance with the Contract Documents.

C. Sod restoration on private property shall be done as approved by the CITY AND ENGINEER.

1.12 REMOVE AND DISPOSE EXISTING FENCE (Bid Item No. 12 & 13)

A. Measurement for payment to remove and dispose existing fences will be based upon the actual number of linear feet of such fence actually removed and disposed of all in accordance with the Contract Documents.

B. Payment to remove and dispose existing fences will be made at the unit price per linear foot of fence removed and disposed of named in the bid, including disposal, excavation, cutting, and all else necessary for a complete and disposal.

1.13 FURNISH AND INSTALL NEW CHAINLINK FENCE
(Bid Item No. 14)

A. Measurement for payment for furnishing and installing chain link fence will be based upon the actual number of linear feet shown on the CONTRACT DOCUMENTS.

B. Payment for furnishing and installing of chain link fence will be made at the unit price per linear foot of fence, including clearing and grubbing, excavation, posts, below grade concrete encased post support, top and bottom rails, gates, hardware, and all else necessary for a complete and functional installation.

C. New fence installation will re-place an existing fence removed. New fence shall be replaced at the Right of way line with material matching the size and type of the existing fence that was removed. Payment shall be made for new fences as approved by the ENGINEER.

1.14 FURNISH AND INSTALL NEW WOOD FENCE
(Bid Item No. 15)

A. Measurement for payment for furnishing and installing wood fence will be based upon the actual number of linear feet shown on the CONTRACT DOCUMENTS.

B. Payment for furnishing and installing of wood fence will be made at the unit price per linear foot of fence, including clearing and grubbing, excavation, posts, below grade concrete encased post support, top and bottom rails, gates, hardware, and all else necessary for a complete and functional installation.

D. New fence installation will re-place an existing fence removed. New fence shall be replaced at the Right of way line with material matching the size and type of the existing fence that was removed. Payment shall be made for new fences as approved by the ENGINEER.

1.15 REMOVE AND REPLACE EXISTING FENCE (Bid Item No. 16 & 17)

A. Measurement for payment to remove and replace existing fences will be based upon the actual number of linear feet of such fence actually relocated or replaced all in accordance with the Contract Documents.

B. Payment for removing and replacing of existing fence will be made at the unit price per linear foot of fence removed and replaced named in the bid, including clearing and

grubbing, excavation, posts, below grade concrete encased post support posts, top and bottom rails, gates, hardware, and all else necessary for a complete and functional installation.

C. Fence shall be replaced with material matching the size and type of the existing fence. Payment shall be made for fences relocated or replaced as approved by the ENGINEER.

1.16 FURNISH AND INSTALL CHAINLINK FENCE AND SWING GATE (LIFT STATION) (Bid Item No. 18)

A. Measurement for payment for furnishing and installing chain link fence will be based upon the actual number of linear feet shown on the CONTRACT DOCUMENTS.

B. Payment for furnishing and installing of fence will be made at the unit price per linear foot of fence, including clearing and grubbing, excavation, posts, below grade concrete encased post support posts, top and bottom rails, gates, hardware, all items shown on Lift Station Chain Link Fence Detail and Lift Station 12' Swing Gate Detail on Sheet C-10 and all else necessary for a complete and functional installation.

1.17 FURNISH AND INSTALL PRE-CAST SANITARY SEWER MAINTENANCE ACCESS STRUCTURE (Bid Item No. 19 & 20)

A. Measurement for payment to furnish and install sanitary sewer maintenance access structures will be based upon the actual quantity, each, of such maintenance access structures constructed, all in accordance with the requirement of the Contract Documents.

B. Payment for furnishing and installing sanitary sewer maintenance access structures will be made at the unit price, each, named in the Bid Schedule which price shall constitute full compensation for the completed installation of the structure including but not limited to excavation, dewatering, sheeting, backfill and compaction, manhole ring and cover, brickwork, grout, concrete collar, boot, interior and exterior coatings, and construction of the reinforced concrete structure including precast bench and invert system.

C. Existing service must be maintained to all customers throughout the course of construction. Temporary piping, temporary lateral connections, tanker truck usage, dumping fees, pumps, etc. and all else necessary to maintain service to customers is included as part of this Bid Item.

1.18 FURNISH AND INSTALL SANITARY SEWER MAIN PIPING (Bid Item No. 21 - 23)

A. Measurement for payment for furnishing and installing sewer pipe will be based upon the number of linear feet of such pipe actually constructed as determined by measurement along the centerline of the pipe in place, not including through structures, all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and installing sewer pipe shall constitute full compensation for the complete installation of the sewer pipe including but not limited to pipe, excavation, dewatering, sheeting, testing, TV/Video inspection, coordination with Lake Worth Utilities

regarding the support of existing power pole(s), night work, backfill, cleaning and compaction. Pipe must meet strict CITY standards for line and grade.

C. This line item shall also include the video inspection of all gravity sanitary sewer mains after construction; sanitary sewer laterals (if necessary), cleaning of pipe, all equipment necessary to provide electronic media in accordance with the Contract Documents for OWNER review and approval and all else necessary for acceptance of media by OWNER. Any rejections that require re-televising will be performed at the cost of the CONTRACTOR.

1.19 FURNISH AND INSTALL SANITARY SEWER LATERAL W/ CLEANOUT (Bid Item No. 24)

A. Measurement for payment to furnish and install sanitary sewer laterals will be based upon the actual number, each, of such sanitary sewer laterals installed, all in accordance with requirements of the Contract Documents.

B. Payment for furnishing and installing sanitary sewer laterals will be made at the unit price each, named in the Bid Schedule which price shall constitute full compensation for the complete installation of the sanitary sewer laterals including, but not limited to main line wye, PVC (SDR-26 or C-900) or DIP pipe, clean out(s), concrete collar, fittings, marker stake, handhole ring and cover, tapped bronze plate and recessed nut, excavation, dewatering, backfill and compaction for a complete and functional installation.

C. The CONTRACTOR shall coordinate with homeowner to determine the best location to install the sanitary sewer lateral and cleanout based upon the preference of the resident and location of the residents existing septic tank.

1.20 FURNISH AND INSTALL P.V.C. SANITARY FORCE MAIN PIPE & FITTINGS (Bid Item No. 25)

A. Measurement of payment for furnish and install sanitary force main pipe and fittings shall be based upon the number of linear feet of such pipe actually constructed as determined by measurement along the centerline of the pipe in place named in the Bid Schedule for such piping and fittings furnished and installed all in accordance with the Contract Documents.

B. Payment for furnishing and installing sanitary force main pipe and fittings will be made at the unit price per linear foot of pipe named in the Bid Schedule and shall include excavation, storing and transporting, piping, fittings including restraints, backfill, cleaning, compaction, force main entering manhole (see detail) including restraints, hydrostatic pressure testing approvals, and all else necessary for a complete and functional installation.

1.21 CORE INTO EXISTING SANITARY SEWER STRUCTURE AND RECONSTRUCT EXISTING FLOW CHANNELS (Bid Item No. 26)

A. Measurement for payment to connect proposed sanitary sewer main to existing MAS, will be based upon the actual quantity, each, of such connections made, all in accordance with

the requirements of the Contract Documents.

B. Payment for connections to connect proposed sanitary sewer main to existing MAS, will be made at the price bid, each, named in the Bid Schedule which price shall constitute full compensation for the connection to the existing sanitary MAS, including but not limited to excavation, backfill, dewatering, connections, fittings, plugs, construction of the connection, reconstruction of existing flow channels, and all other appurtenances necessary for a complete and functional installation.

1.22 FURNISH AND INSTALL PRE-FABRICATED MANUFACTURED ODORLESS PUMP STATION (MOPS) OR APPROVED EQUAL (Bid Item No. 27)

A. Measurement for payment to furnish and install a pre-fabricated manufactured odorless pump station (MOPS) will be based upon the actual quantity, each, of such sanitary sewer pump stations constructed, all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and installing a pre-fabricated manufactured odorless pump station (MOPS) will be made at the lump sum price each, named in the Bid Schedule which price shall constitute full compensation for the completed installation of the structure including but not limited to all items shown on pre-fabricated pump station Sheet LS-1, excavation, dewatering, backfill and compaction, disposal of excess material, sheeting, wet well and access hatch, couplings, existing tree protection, concrete pads, traffic bollards, grading, all piping, valves, valve vaults and access hatch, backflow preventer, fittings, couplings, pipe supports, installing proposed electrical service from hand hole (provided by City of Lake Worth Utilities) to Pump Station, scrubber, internal float controls, electrical connection panel, all other appurtenances, coordination with the City of Lake Worth for power supply and all restoration WORK. Pumps will be supplied by CONTRACTOR. Lift station shall be complete, energized and ready for service.

C. This line item also includes all costs associated with the Electrical design and final certification to service the proposed pump station including retaining a State of Florida Registered Electrical Engineer to prepare signed and sealed Electrical Drawings for submittal and approval through City of Lake Worth Building Department.

D. This line item also includes installation of Remote Terminal Unit (RTU). CITY will supply RTU and CONTRACTOR will install RTU including installation of but not limited to antenna, control panels, radios, software, wiring, conduits, transmitters, and all else necessary for a complete and functional system acceptable to City of Lake Worth.

E. Pump station water service and water meter box paid for under pay items 31 and 33. Water meter supplied by CITY and installed by CONTRACTOR.

1.23 FURNISH AND INSTALL TEMPORARY WATER MAIN AND WATER SERVICES (Bid Item No. 28)

A. Measurement for payment for furnishing and installing temporary water main and water services will be based upon the lump sum price named in the Bid Schedule, all in accordance with the Contract Documents.

B. Payment for furnishing and installing temporary water main and water services will be based upon the lump sum price named in the Bid Schedule which price shall constitute full compensation for its complete installation of the temporary water main and water service(s) from the temporary water main to the existing water meter(s) including but not limited to connection to existing water main, excavation, piping, fittings, backflow preventer, connecting temporary water services to existing water meters, coordinating and maintaining temporary water main and services throughout construction, relocations/adjustments to temporary water main and services as required, removal and disposal of temporary water main and services, field explorations necessary to locate existing water meters and all else necessary for a complete and functional installation.

1.24 FURNISH AND INSTALL WATER MAIN PIPE (Bid Item No. 29)

A. Measurement for payment for furnishing and installing water main pipe will be based upon the number of linear feet of such pipe actually constructed as determined by measurement along the centerline of the pipe in place, inclusive of valve structures, vaults and casings, megalugs, restraints all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and installing water main iron pipe will be made at the unit price per linear foot of pipe named in the Bid Schedule which price shall constitute full compensation for the complete installation of ductile iron pipe and restraints, including but not limited to, providing all necessary pipe excavation, dewatering, bedding, backfilling, night work, flowable fill, compaction, tracer wire, joint restraints, and temporary relocation of existing utilities as required for a complete and functional installation.

1.25 FURNISH AND INSTALL DIP FITTINGS (Bid Item No. 30)

A. Measurement for payment to furnish and install fittings shall be based upon the unit bid price per ton named in the Bid Schedule for such fittings furnished all in accordance with the Contract Documents. Weight will be based on compact fitting weight only not including megalugs.

B. Payment for furnishing and installing fittings shall be at the unit bid price per ton and shall include furnishing, complete installation including storing and transporting the fittings.

1.26 FURNISH AND INSTALL NEW WATER SERVICE AND CONNECT TO NEW OR EXISTING WATER METER/BOX (Bid Item No. 31 and 32)

A. Measurement for payment to furnish and install new water service and connecting to new or existing water meter/box will be based upon the actual number, each, of water services actually installed and connected to new or existing water meter/box, all in accordance with

the Contract Documents.

B. Payment for furnishing and installing new water service and connecting to new or existing water meter/box will be made at the unit price, each, named in the Bid Schedule which price shall constitute full compensation for its complete installation of the new water service piping from the new water main to the new or existing water meter/box located at the property line or up to 15' within private property, water service piping, casing pipe, bedding, fittings, field explorations necessary to locate existing water meters, removal of existing water services, complete restoration of private property and all else necessary for a complete and functional installation. Payment for this item shall be made upon completion of all items stated above.

1.27 FURNISH AND INSTALL NEW WATER METER BOX
(Bid Item No. 33)

A. Measurement for payment to furnish and install new water meter box will be based upon the actual number, each, of water meter boxes installed all in accordance with the Contract Documents.

B. Payment for furnishing and installing new water meter box will be made at the unit price, each, named in the Bid Schedule which price shall constitute full compensation for its complete installation of the new meter box, bedding, fittings, field explorations necessary to locate existing water meters and all else necessary for a complete and functional installation. Payment for this item shall be made upon completion of all items stated above.

1.28 FURNISH AND INSTALL GATE VALVE W/ BOX (Bid Item No. 34)

A. Measurement for payment to furnish and install valves will be based upon actual quantity, each, of such valves and boxes furnished and installed, all in accordance with the requirements of the Contract Documents, except that additional valves incorporated for testing purposes shall be at the sole expense of the CONTRACTOR.

B. Payment for furnishing and installing valves and boxes will be made at the unit price, each, named in the Bid Schedule which price shall constitute full compensation for the completed installation of the valve, including valve box and extension to finish grade and concrete collar installed in unpaved areas.

1.29 FURNISH AND INSTALL TAPPING SLEEVE AND VALVE
(Bid Item No. 35)

A. Measurement for payment to connect to existing water main with tapping sleeve and valve/saddle tap and corporation stop will be based upon actual quantity, each, of such tapping sleeve and valve/saddle tap and corporation stop (furnished and installed), all in accordance with the requirements of the Contract Documents.

B. Payment for connection to existing main with tapping sleeves and valves/saddle tap and corporation stop will be made at the unit price each, named in the Bid Schedule, which price shall constitute full compensation for the satisfactory connection including furnishing and

installation of the tapping sleeve, valve, valve extension and valve box, restraining existing water main a minimum of one (1) joint on each side of the tap, dewatering, excavation, backfill and all else necessary for a complete and functional installation.

1.30 CONNECT TO EXISTING WATER MAIN (Bid Item No. 36)

A. Measurement for payment to connect to existing water main by means of removing existing plugs and connecting proposed water main will be based upon actual quantity, each, of such connections made in accordance with the contract document.

B. Payment to connect to existing water main by means of removing existing plugs and connecting proposed water main will be made at the unit price each, named in the bid schedule which price shall constitute full compensation for the completed installation of the connection, including shutting down existing main (which includes verifying location of existing adjacent gate valves), cutting main, restraining existing water main a minimum of one (1) joint on each side of the connection point, spool pieces and installation of the connection fittings and all else necessary for a complete and functional installation.

1.31 REMOVE AND DISPOSE EXISTING WATER MAIN (Bid Item No. 37)

A. Measurement for payment to remove and dispose of existing water main will be based upon the actual linear feet of water main piping removed and disposed of, all in accordance with the Contract Documents.

B. Payment for removing and dispose of existing water main pipe will be made at the unit price per linear foot of pipe named in the Bid Schedule which price shall constitute full compensation for removing and disposing of such pipe, including excavation, dewatering, cutting existing pipe, capping existing pipe, removing existing valves, backfilling trench, compaction, and all restoration work.

1.32 REMOVE AND DISPOSE OF EXISTING METER BOXES
(Bid Item No. 38)

A. Measurement for payment to remove and dispose of existing meter boxes will be based upon the actual number, each, of such meter boxes removed, all in accordance with the Contract Documents.

B. Payment for removal and disposal of existing meter boxes and water services will be made at the unit price, each, named in the Bid Schedule which price shall constitute full compensation for the removal and disposal of each meter box, excavation, backfill, compaction, all restoration work, and all else necessary for the complete removal.

1.33 REMOVE AND DISPOSE EXISTING RETIRED GAS MAIN (Bid Item No. 39)

A. Measurement for payment to remove and dispose of existing gas main will be based upon the actual number of linear feet of existing gas main piping removed and disposed of, all in accordance with the Contract Documents.

B. Payment for removing and dispose of existing gas main pipe will be made at the unit price per linear foot of pipe named in the Bid Schedule which price shall constitute full compensation for removing and disposing of such pipe, including excavation, dewatering, coordination with franchise utility gas company to ensure the existing gas main is out of service, cutting existing pipe, capping existing pipe, removing existing valves, backfilling trench, compaction, and all restoration work.

1.34 FURNISH AND INSTALL SAMPLE POINT (Bid Item No. 40)

A. Measurement for payment for sample points will be based upon the actual number; each of such sample points furnished and installed, all in accordance with requirements of the Contract documents.

B. Payment for sample points will be made at the unit price, each, named in the Bid Schedule which price shall constitute full compensation for the complete installation of sample point, testing, removal and disposal after sampling is complete.

1.35 ABANDON AND CAP EXISTING WATER MAIN (Bid Item No. 41)

A. Measurement for payment to abandon, cap and grout pipe will be based upon the actual number of linear feet of such pipe actually abandoned, all in accordance with the Contract Documents.

B. Payment for abandoning, capping and grouting of existing pipe will be made at the unit price per linear foot of pipe named in the Bid Schedule which price shall constitute full compensation for the abandoning, grouting and plugging of such pipe, including excavation, cutting existing pipe, capping existing pipe, backfilling trench, compaction, removal of existing valves, and all restoration WORK. Limits of payment for abandonment shall be based on as-built locations of caps installed for grouting.

C. CONTRACTOR shall verify that all existing house connections have been disconnected prior to grouting of existing pipelines. Any damages incurred to private property due to house connections not disconnected prior to grouting the pipe, the CONTRACTOR shall repair and/or replace damage at no expense to the OWNER.

D. Existing pressure mains to be abandoned and grouted shall be cut and capped/plugged within two (2') feet of the main pressure line to remain in service. The CONTRACTOR shall determine the actual location of the existing connection to the main line by excavation, potholing, etc.

1.36 FURNISH AND PLACE THERMOPLASTIC PAVEMENT MARKING
(Bid Item No. 42 and 43)

A. Measurement for payment for furnishing and placing thermoplastic pavement markings will be based upon the number of linear feet of such markings actually constructed as determined by measurement along the centerline of the pavement markings in place, including temporary striping, temporary layout, final thermoplastic striping, etc. all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and placing thermoplastic pavement markings will be made at the unit price per linear foot or each of pavement markings named in the Bid Schedule.

1.37 REMOVE AND DISPOSE OF EXISTING TREES (Bid Item No. 44)

A. Measurement for removal and disposal of trees will be made on a unit price per each tree removed basis. The CONTRACTOR shall be paid the amount indicated in the bid proposal for each tree required to be removed for the proper execution of the WORK as directed by the ENGINEER. This price paid shall be for each tree including obtaining appropriate tree removal permits, removal of stumps and disposal of all debris associated with the removal of the tree.

B. Payment to remove and dispose of trees will be made at the unit price each named in the Bid Schedule. Removal and disposal of trees shall include obtaining of appropriate tree removal permits, cutting of the tree, removal of the stump, and the removal disposal of all vegetative matter associated with the removal of trees, as required by the Contract Documents or directed by the ENGINEER.

1.38 RELOCATE EXISTING TREES (Bid Item No. 45)

A. Measurement for relocation of existing trees will be made on a unit price per each tree relocated. The CONTRACTOR shall be paid the amount indicated in the bid proposal for each tree relocated for the proper execution of the WORK as directed by the ENGINEER. This price paid shall be for each relocated tree including obtaining appropriate tree removal permits, backfill, and disposal of all debris associated with the relocation of the tree.

B. Payment to relocate trees will be made at the unit price each named in the Bid Schedule. Relocation of trees shall include obtaining of appropriate tree removal permits, spading of the tree, root pruning, replanting, maintenance, backfill, and the removal disposal of all vegetative matter associated with the relocation of trees as required by the Contract Documents or directed by the ENGINEER.

C. The ENGINEER may direct the CONTRACTOR to relocate trees to adjacent private property when requested by homeowners. Homeowners must sign a waiver and assume maintenance responsibility for trees in such situations. CONTRACTOR shall stake right of way limits a minimum of two weeks in advance of construction in order to coordinate with adjacent property owners and possible conflicting utilities.

1.39 OPTIONAL SERVICES (Bid Item No. 46)

A. Bid Item “Optional Services”, is a contingency item to be utilized ONLY as authorized by the CITY. This Item may authorize additional work to the CONTRACTOR for unforeseen conditions and for items not specifically included in the individual bid items. This item may not be used at all or may be partially used. The disbursement of any/all of this item is totally at the discretion of the ENGINEER/CITY and shall **not** be considered "due" the CONTRACTOR.

1.40 PERMIT FEE ALLOWANCE (Bid Item No. 47)

A. Bid Item “Permit Fee Allowance”, is an allowance item to be utilized ONLY as authorized by the CITY. This Item is to pay for the City of Lake Worth Building Department Electrical and Plumbing Permit fee associated with the installation of water services after the water meter on private property and Electrical items associated with the proposed pump station. This item may not be used at all or may be partially used. The disbursement of any/all of this item is totally at the discretion of the ENGINEER/CITY and shall not be considered "due" the CONTRACTOR. The CONTRACTOR shall produce documentation upon request verifying actual cost. Only permit fees substantiated and approved by the ENGINEER will be paid as part of this bid item.

END OF SECTION 01024

SECTION 01040

COORDINATION

PART 1 - GENERAL

1.01 PRECONSTRUCTION MEETING

A. Prior to commencement of Work, a pre-construction meeting will be held in compliance with the applicable provisions of Section 01200, for the purpose of clarifying the administrative procedures for prosecution of the Work, of explaining any requirements of the Contract Documents for which clarifications have been requested and of highlighting the coordination effort required of the CONTRACTOR with other occupiers of the site, if any, with the work of other contractors performing work for the CITY in the vicinity of the site and with respect to utilities and other existing surface and subsurface installations.

1.02 COORDINATION OF DRAWINGS AND SPECIFICATIONS

A. Before starting any Work, CONTRACTOR shall review all Drawings and Specifications and immediately report to the ENGINEER, in writing, any errors, discrepancies, and/or omissions discovered.

B. Where differences are discovered between Drawings and Specifications or within either document itself, CONTRACTOR shall notify ENGINEER and request interpretation or decision before proceeding with the Work. ENGINEER, on behalf of CITY, will have final decision regarding such item and manner in which the Work is to be installed and such decision will be final. Otherwise, CONTRACTOR shall include the item or arrangement of better quality, greater quantity, or higher cost in Bid Price.

C. CONTRACTOR shall compare Drawings and verify dimensions, clearances and the like before laying out Work and will be held responsible for conflicts that might have been avoided by such verification.

D. Drawings are diagrammatic and indicate general arrangement of systems and work included in the Contract. CONTRACTOR shall notify ENGINEER of discrepancies before proceeding.

1.03 COORDINATION OF THE WORK

A. Coordinate construction activities of the different trades, disciplines or elements of the Work to assure efficient and orderly sequence of installation of construction elements.

B. Coordinate construction activities of the work elements that are interrelated and required to connect to and mesh with the operations of other contractors working adjacent to the site. Coordinate work of various interdependent elements whose characteristics require provisions for future installation, connection and placement in service of facilities.

C. Integrate elements of Work, uncover ill-timed, defective, and non-conforming work, and provide samples for testing.

1.04 COORDINATION OF SUBCONTRACTORS

A. In the event the CONTRACTOR subcontracts some of the Work to Subcontractors, the CONTRACTOR shall remain solely responsible for performance of the Work of the Contract and for the Subcontractors' compliance with all the requirements of the Contract Documents. CONTRACTOR shall assume full responsibility for administering Work performed by subcontractors in accordance with the Contract Documents.

1.05 COORDINATION OF UTILITY ADJUSTMENTS/INSTALLATIONS

A. The CONTRACTOR shall be responsible for fully coordinating with utility companies/ agencies any work required in relation to the removal, relocation or other adjustment of utility services existing in the area of construction. Existing utilities and appurtenances shown on the Drawings were located from existing records but no guaranty is made that all existing facilities are shown or that those shown are entirely accurate. The Contractor shall be responsible for determining the exact location of all underground utilities with the respective companies/agencies prior to the commencement of any subsurface work on the project.

END OF SECTION 01040

SECTION 01041

PROJECT COORDINATION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Engineer will coordinate the work between Contractor and the City.

B. The Contractor shall:

1. Coordinate work of his employees and subcontractors.

2. Expedite his work to assure compliance with schedules.

3. Comply with orders and instructions of Engineer.

1.02 RELATED REQUIREMENTS

A. All applicable sections of the specification.

1.03 CONSTRUCTION ORGANIZATION AND START-UP

Engineer shall establish on-site lines of authority and communications:

A. Schedule and conduct preconstruction meeting and progress meetings as specified in Section 01200.

B. Establish intra-project communications procedures for:

1. Submittals

2. Reports and records

3. Recommendations

4. Coordination of drawings

5. Schedules

6. Resolution of conflicts

C. Interpret Contract Documents: Transmit written interpretations to Contractor and to other concerned parties.

D. Assist in obtaining permits and approvals: Verify that contractor and subcontractors have obtained inspections for Work and for temporary facilities.

E. Control the use of Site: Through coordination with the City, allocate space for Contractor's use for field offices, sheds, and work and storage areas.

F. Inspection and Testing:

1. Inspect work to assure performance in accord with requirements of Contract Documents.

2. Administer special testing and inspections of suspect Work.

3. Reject Work which does not comply with requirements of Contract Documents.

4. Coordinate Testing Laboratory Services:

a. Verify that required laboratory personnel are present.

b. Verify that tests are made in accordance with specified standards.

c. Review test reports for compliance with specified criteria.

d. Recommend and administer any required re-testing.

1.04 CONTRACTOR'S DUTIES

A. Construction Schedules:

1. Prepare a detailed schedule of basic operations.

2. Monitor schedules as work progresses:

a. Identify potential variances between scheduled and probable completion dates for each phase.

b. Recommend to Owner adjustments in schedule to meet required completion dates.

c. Document changes in schedule; submit to Owner, Engineer and to involved subcontractors.

3. Observe work of each subcontractor to monitor compliance with schedule.

a. Verify that labor and equipment are adequate for the work and the schedule.

b. Verify that product procurement schedules are adequate.

c. Verify that product deliveries are adequate to maintain schedule.

d. Report noncompliance to Engineer, with recommendation for changes.

B. Process Shop Drawings, Product Data and Samples: Prior to submittal to Engineer, review for compliance with Contract Documents:

1. Field dimensions and clearance dimensions.

2. Relation to available space.

3. Effect of any changes on the work of any subcontractor.

C. Review Drawings prepared by subcontractors: Prior to submittal to Engineer, review for compliance with Contract Documents.

D. Prepare Coordination Drawings as required to resolve conflicts and to assure coordination of the work of, or affected by, mechanical, electrical, etc., trades, or by special equipment requirements.

1. Submit to Engineer.

2. Reproduce and distribute copies to concerned parties after Engineer review.

E. Maintain Reports and Records at Job Site, available to Engineer and Owner.

1. Daily log of progress of work.

2. Records

a. Contracts

b. Purchase orders

c. Materials and equipment records

d. Applicable handbooks, codes and standards

3. Maintain file of record documents

1.05 CONTRACTOR'S CLOSE-OUT DUTIES

A. Mechanical and Electrical equipment start-up:

1. Coordinate check-out of utilities, operational systems and equipment.

2. Organize initial start-up and testing.

3. Record dates of start of operation of systems and equipment.

4. Submit to Owner written notice of beginning of warranty period for equipment put into service.

B. At completion of Work, conduct an inspection to assure that:

1. Specified cleaning has been accomplished.

2. Temporary facilities have been removed from site.

C. Substantial Completion:

1. Conduct an inspection to develop a list of Work to be completed or corrected.

2. Assist Engineer in inspection.

3. Supervise correction and completion of work of subcontractors.

4. Contractor to provide the Owner a letter stating that all shop drawings, Requests for Information and Change Orders submitted have been responded and closed out.

5. Contractor is required to finalize and/all outstanding Tax Saver Credit prior to receiving his final payment.

6. Contractor must submit prior to Substantial Completion a final Tax Saver executed vendor list.

7. After substantial walk-through has been completed Owner will coordinate a meeting between the City of Lake Worth Public Services Department and the Contractor for on-site training dealing with the installed improvements. Contractor is to submit three copies to the Public Services Department of any/all manuals and warranties three weeks prior to the training.

8. Prepare As-builts and Record Drawings, specification corrections, other manuals not dealing with training, and any/all testing work will be sent to Craven Thompson & Associates, Inc. no later than thirty days after substantial completion walk-through but prior to the final payment. Final payment will not be reviewed until all submittal have been issued.

9. Contractor will provide copies of all approved inspections as part of the walk-through.

1.06 ENGINEER'S CLOSE-OUT DUTIES

A. Final Completion: When Contractor determines that Work is finally complete, conduct an inspection to verify completion of Work.

B. Administration of Contract closeout:

1. Receive and review Contractor's final submittals.

2. Transmit to Owner with recommendations for action.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 01041

SECTION 01050

FIELD ENGINEERING

PART 1 - GENERAL

1.01 SCOPE

A. CONTRACTOR shall provide field engineering services as necessary to perform and complete the Work of the Contract, as indicated on Drawings and specified in this Section.

B. CONTRACTOR shall provide the services of a land surveyor to perform project related surveys.

1.02 QUALIFICATIONS OF SURVEYOR

A. The land surveyor shall be a Professional Engineer or Registered Land Surveyor registered in the State of Florida. CONTRACTOR shall submit to ENGINEER the name, address and evidence of current registration of surveyor or professional engineer.

1.03 SURVEY REQUIREMENTS

A. The scope of survey work shall include:

1. Protect and, if damaged or destroyed, properly replace survey reference points.

2. Establish project survey control points and set out lines and levels, locate and lay out all site improvements and other work. Including determining the limits of driveway/walkway/sod restoration on private property based upon grading provided within the right-of way.

3. Verify all lay out and record locations, with horizontal and vertical data, for Project Record Documents and submit documentation to verify accuracy of field survey work.

4. Conduct all surveys required for measurements of work for payment purposes. Provide signed and sealed certified quantities for pay estimates to accompany each Pay Request.

5. On completion of work, prepare a certified survey showing finished dimensions, locations, angles and elevations of construction, duly signed and sealed by the surveyor, certifying that elevations and locations of improvements are in conformance with Contract Documents.

6. During the construction process, maintain records of all deviations from the

Contract Documents and prepare As-built Drawings showing correctly and accurately all changes and deviations made during construction to reflect the work as it was actually constructed and subsequently surveyed. Also refer to Engineering As-built Requirements within General Notes and Specifications.

1.04 SURVEY REFERENCE POINTS

A. Existing basic horizontal and vertical control points are designated on Drawings. All elevations are referred to NAVD 1988; Horizontal Control - NAD 83, Florida State Plane Coordinates. Establish all vertical and horizontal controls required for construction.

B. Locate and protect control points prior to starting site work, and preserve permanent reference points during construction.

1. Make no changes or relocations of such points without prior written notice to and concurrence of ENGINEER.

2. Report to ENGINEER when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

3. Replace control points that may be lost or destroyed. Establish replacements based on original survey control.

4. ENGINEER will identify existing control points and property line corner stakes indicated on Drawings, as required.

1.05 PROJECT SURVEY REQUIREMENTS

A. Establish a minimum of two permanent bench marks on the project site, all referenced to data established by survey control points. Record locations, with horizontal and vertical data, on Project Record Documents.

B. Establish lines and levels, locate and lay out, by instrument and similar appropriate means.

1. Site improvements, including storm sewer system.

2. Drainage structures, including inlets, manholes, pollution control structures complete with invert and weir elevations, locations of storm sewer connections, levels of manhole frames and covers and other pertinent survey data.

C. Verify layouts by same methods from time to time.

1.06 RECORDS

A. Maintain a complete, accurate log of control and survey work as it progresses.

B. On completion of major site improvements, prepare a certified survey showing finished dimensions, locations, angles and elevations of construction.

C. On request of ENGINEER, submit documentation to verify accuracy of field survey work.

D. Submit certificate, duly signed and sealed by the surveyor, certifying that elevations and locations of improvements are in conformance with Contract Documents.

1.07 PROJECT SIGNS

A. Subject to compliance with local regulations and prior approval of CITY as to size, design, type and location, CONTRACTOR and Subcontractors may erect temporary signs for purposes of identification. Signs for maintenance and control of traffic may also be required and/or approved.

B. Furnish, erect, and maintain such signs as may be required by Safety Regulations or as necessary to safeguard life and property.

END OF SECTION 01050

SECTION 01100

SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.01 EXISTING CONDITIONS

A. This Project is in an area with existing improvements consisting of water, sanitary sewer, franchise utilities and storm drains. The Project is located within the City of Lake Worth, in Palm Beach County, Florida. The work shall be conducted in a manner that will minimize restriction of access to public and private property and facilities, and minimize disruption of traffic. The CONTRACTOR shall exercise extreme care to prevent damage to and interference with existing improvements and to maintain the adjacent areas and travel routes safe for pedestrian and vehicular traffic at all times.

1.02 EXISTING IMPROVEMENTS/UTILITIES

A. Existing improvements, including utilities, both surface and subsurface, shown on the Drawings were located from existing records. No guaranty is made that all improvements are shown or that those shown are entirely accurate. It is the CONTRACTOR's responsibility to verify the locations, character and depths of all existing improvements prior to performing any Work. The City and ENGINEER will assume no liability for damages sustained or costs incurred because of the CONTRACTOR's operations in the vicinity of existing improvements. The CONTRACTOR hereby agrees that he shall have no claim for delay or for extra compensation and that he shall have no claims for relief from any obligation or responsibility under the Contract on account of any surface or subsurface improvements or utilities encountered. CONTRACTOR shall notify the ENGINEER of any deviation between existing conditions and the Drawings. The CONTRACTOR shall coordinate all utility related work, of whatever nature, with the utility company or companies whose services are impacted by the proposed construction or any element thereof.

1.03 LAND FOR FIELD OFFICES, STORAGE AND CONSTRUCTION PURPOSES

A. CONTRACTOR shall obtain and pay all costs in connection with any additional work areas, storage sites, and access to the construction site or temporary right-of-way that may be required for proper completion of the work.

B. Responsibility for safety and security of the storage site, including protection and safekeeping of equipment and materials at or near the construction site, shall be solely that of the CONTRACTOR and no claims shall be made against the City by reason of any act of an employee or trespasser. CONTRACTOR shall place no equipment or materials upon public or private property until permission has been received. Any agreement between CONTRACTOR and alternate entity for use of land shall be submitted to City for review and approval.

C. Upon completion of the Contract, CONTRACTOR shall remove from the site and storage area all equipment, field offices, fencing, rubbish, etc., and leave the areas clean and restored to its original condition. CONTRACTOR shall fill, compact and resurface all holes or excavations made for fence installation, as directed by the ENGINEER.

1.04 WATER POLLUTION PREVENTION AND EROSION CONTROL

A. When required to dispose of water from dewatering and other operations, CONTRACTOR shall obtain and pay for all necessary permits, shall take all actions necessary to prevent contamination of or disturbance to the environment or natural habitat of the properties adjacent to the site, and shall comply with all permit requirements and restrictions as set by the regulatory agencies having jurisdiction. CONTRACTOR shall schedule and control operations so as to confine all runoff water from disturbed surfaces, water from dewatering operations and water in existing ditches that becomes contaminated with lime silt, muck and other deleterious matter from the construction operations.

B. CONTRACTOR shall provide all temporary materials and operations necessary to attain the required pollution and erosion controls including, but not limited to, temporary seeding, filter blankets, chemicals, temporary dikes and ditches, silt screens, fiber mats, mulches, sod, bituminous spray and other erosion control devices. The pollution control procedures shall include control of lime suspended in water which may flow into canals and ditches and which may require the use of screens, filter blankets and coagulants within such ditches. CONTRACTOR shall maintain all pollution and erosion prevention procedures, materials, equipment and other related items in an approved condition until notified by the ENGINEER to discontinue such maintenance.

C. Where necessary, CONTRACTOR shall channel runoff water from construction areas and all water from dewatering operations into temporary stilling basins.

D. The CONTRACTOR shall furnish all labor and equipment and perform all work required for the prevention of environmental pollution during and as a result of the work under this contract. The CONTRACTOR shall be responsible for preparing and complying with the requirements of the National Pollution Prevention Discharge Elimination System (NPDES) and Storm Water Pollution Prevention Plan (SWPPP), including preparation of Storm Water Pollution Prevention Plan (SWPPP) and submittal of the Notice of Intent (NOI) prior to start of construction and submittal of Notice of Termination (NOT) after final project certification and approval. For the purpose of this contract environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utility of the environment for aesthetic and recreational purposes. The control of environmental pollution requires consideration of air, water, land and involves noise, solid waste management and management of radiant energy and radioactive materials, as well as other pollutants.

1.05 COORDINATION WITH TRAFFIC CONTROL AGENCIES

A. CONTRACTOR shall perform the construction work with minimum interruption of traffic movement on existing streets and roadways. In order to limit such interruption, CONTRACTOR shall coordinate the work with all agencies having jurisdiction and schedule the work so that interruptions are held to a minimum.

B. In the work schedule submittals, CONTRACTOR shall provide documentation of the CONTRACTOR's coordination with such agencies and shall not deviate from the approved schedule without prior approval. CONTRACTOR shall provide proper maintenance and control of all traffic in the areas of construction during the course of construction and shall furnish and maintain all required traffic control signs and devices, barricades, safety cones, flashers, flambeaus and similar devices.

1.06 PROGRESS SCHEDULE

A. Immediately after award of Contract and prior to the pre-construction conference, CONTRACTOR shall submit to the CITY a construction progress schedule showing chronologically all operations contemplated and necessary for the successful completion of the work within the agreed contract time, phases and a schedule of shop drawings and submissions. The schedule shall include a detailed description of the proposed construction elements and procedures, indicating the proposed degree of coordination and compliance with the requirements of the traffic control agencies. The CITY reserves the right to make changes to the schedule and sequence as necessary to facilitate the work or to minimize any conflict with traffic operations.

B. Prior to commencement of construction, a pre-construction meeting will be held to review CONTRACTOR's construction progress schedule, proposed sequence of construction and schedule of values, to establish a working understanding between the parties as to the project and other pre-construction activities. At the pre-construction conference, the CONTRACTOR shall review the schedules with the City and Engineer. Thereafter, the CONTRACTOR shall add calendar dates and shall modify and/or correct the schedule until satisfactory to the City, at which time it will be approved for use by the CONTRACTOR for planning, organizing, and directing the work of the project.

Additionally, prior to construction, a Public Information Meeting will be held at City Hall where the public will be invited to ask questions about the construction schedule and process. The CONTRACTOR will be required to present the Construction Schedule at this time.

1.07 CONNECTIONS TO EXISTING PIPING/SYSTEMS

A. Required connections to existing storm water management systems or other piping systems shall be performed in such a manner that no damage and minimal interruption is caused to the existing installations. Any damage caused to existing improvements shall be repaired or replaced at no cost to the CITY. CONTRACTOR shall coordinate construction operations with the utility companies and notify them at least 48 hours in advance of any activity that may impact their systems.

1.08 HYDRAULIC UPLIFT ON STRUCTURES

A. CONTRACTOR shall make all necessary provisions to safeguard any structures that may become buoyant during the construction operations due to groundwater or floods and before the structure is put into service. Should there be any possibility of buoyancy of a structure, CONTRACTOR shall take the necessary steps to prevent its buoyancy either by increasing the structure's weight, by filling it with approved material or other acceptable methods. Damage to any structures due to floating or flooding shall be repaired or, if necessary, the structures shall be replaced at no cost to the CITY.

1.09 UTILITY PROTECTION SHEETING

A. The Contractor shall be responsible for properly supporting the sides of all trenches and excavations with timbers or other supports wherever necessary or required to properly safeguard the trenches and protect the City's existing facilities when new underground construction is within 3 feet of existing watermain/forcemain. The cost of all necessary timber, sheeting and bracing whatsoever left in place or removed, shall be included in the unit price bid for the installed improvements.

B. Portions of the sheeting driven below the elevation of the top of the pipe shall not be disturbed or removed. Sheeting and bracing shall be left in place if so ordered by the Engineer and/or where shown on the Plans to avoid undermining or otherwise endangering the work or adjacent structures. All sheeting left in place shall be cut off or driven at least 30 inches below finished grade, unless otherwise ordered.

C. Great care shall be exercised in the selection of sheeting and bracing of adequate design, type, size and strength. The adequacy of the sheeting used for all supporting and bracing purposes shall be the responsibility of the Contractor. The sizes and length of the sheeting used shall conform closely to the needs of the work and oversizing as well as undersizing should be avoided. In placing and driving the sheeting, proper workmanship and equipment shall be used to achieve a true alignment and close contact of the sheeting boards.

D. Sheeting shall be straight and sound, free from shakes, cracks, large or loose knobs and other defects impairing its strength and durability. It shall be squared to the required dimension throughout its entire length.

E. If required for the proper execution of the work where running sand, quicksand or other semifluid material difficult to handle is encountered, the sheeting shall be tongue and groove.

F. The Contractor may, in lieu of sheeting, bracing and shoring to maintain the allowable trench widths, use a "trench box" ("trench shield" or "mule") provided pipe section are secure downstream by a cable(s) stretched through and secured to the end section of pipe by means of a timber and a cable clamp, all materials being of adequate size and strength. The cable shall be held taut during the process of advancing the "box".

The procedure may be used so long as, in the opinion of the Engineer, the work is proceeding satisfactorily. The Engineer may revoke permission to use the "trench box" at any time he feels unsatisfactorily or inadequate work is being performed and the Contractor shall, without appeal, immediately begin using sheeting, bracing and shoring to maintain the allowable trench widths.

At all times, when soil conditions permit, the bottom edge of the "trench box" shall be no lower than the springline of the pipe, so as not to disturb the trench compaction when advancing the "trench box." No compensation will be made for utilizing the trench box.

END OF SECTION 01100

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Project meetings, including Pre-Construction Conference and Progress Meetings, shall be arranged and conducted in accordance with the administrative and procedural requirements described herein.

1.02 PRE-CONSTRUCTION CONFERENCE

A. The CITY will schedule a pre-construction meeting at a convenient location no later than 10 days after Notice to Proceed but prior to commencement of construction activities. The purpose of the meeting will be to review responsibilities and personnel assignments, to clarify the administrative procedures for prosecution of the work and to explain and/or clarify any requirements of the Contract Documents that are not understood by the CONTRACTOR. Unless previously finalized, the CONTRACTOR's preliminary schedules will be reviewed at the pre-construction conference to enable the CONTRACTOR to finalize the progress schedule, sequence of construction and schedule of values, to add calendar dates and modify and/or correct the schedules as necessary to obtain CITY approval.

B. Agenda: Items to be discussed at the pre-construction conference are all described elsewhere in the Contract Documents but there are items that are of significance in the project and that could affect progress, including such topics as:

1. The project team members and their respective responsibilities.

2. The lines of communication between the various team members.

3. Project construction schedule and sequence of construction.

4. Contract Time(s) and Liquidated Damages.

5. Changes in the Work.

6. Changes in the Time

7. Schedule of Values.

8. Mobilization and staging.

9. Maintenance of Traffic (MOT).

10. Testing and inspections.

11. Submittal of Shop Drawings, Product Data and Samples.

12. Substitutions.

13. Clarifications.

14. Progress meetings.

15. Interim payments to the CONTRACTOR.

16. Retainage and final payment.

17. Project acceptance procedures.

18. Other General Requirements issues.

1.03 PROGRESS MEETINGS

A. Attend periodic progress meetings held at the project site on a regularly scheduled basis agreed upon by all interested parties at pre-construction meeting.

B. Attend special meetings called by CITY or ENGINEER during progress of work.

C. Progress meetings will be administered by the ENGINEER who will prepare the agenda for the meeting and incorporate items provided by the CONTRACTOR. The following list of suggested agenda items may be reviewed and/or discussed:

1. Minutes of previous meeting.

2. Work progress since last meeting.

3. Field observations, problems, and conflicts.

4. Problems which impede construction schedule.

5. Corrective measures and procedures to regain projected schedule.

6. Revision to construction schedule.

7. Maintenance of quality standards.

8. Effects of Contract Scope and/or Time changes.

9. Other business.

D. Reporting:

1. Immediately after each progress meeting date, copies of the meeting minutes will be distribute to each party present and to other parties who should have been present.

2. The construction schedule shall be revised or updated after each progress meeting where revisions to the schedule have been approved or recognized. The revised schedule shall be issued concurrently with the report of each meeting.

E. Attendees: Qualified representatives of CONTRACTOR, Subcontractors and Suppliers authorized to act on behalf of the entity each represents, as well as the CITY's professional and administrative project representatives, including the ENGINEER.

1.04 PUBLIC INFORMATION MEETING

Prior to construction, a Public Information Meeting will be held at City Hall where the public will be invited to ask questions about the construction schedule and process. The CONTRACTOR will be required to present the Construction Schedule at this time.

END OF SECTION 01200

SECTION 01310

CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Immediately after Contract award and prior to final execution of the Contract, the CONTRACTOR shall submit to the ENGINEER for approval a preliminary construction progress schedule for the project in the form of a bar chart. A CPM schedule, consisting of network diagrams, a bar chart and accompanying mathematical analyses, showing the order and interdependence of activities and the sequence in which the work is to be accomplished, may be submitted at the CONTRACTOR's option.

1.02 SCHEDULE CONTENT

A. The schedule shall show the various activities of work in sufficient detail to demonstrate that the CONTRACTOR has a reasonable and workable plan to complete the project within the Contract Time. The schedule shall indicate the times (number of days) for starting and completing the various stages of the work, including Milestones (e.g., completion of Phase 1 Construction, completion of Phase 2 Construction, completion of the bridge, etc,) specified in the Contract Documents. The schedule shall show the order and interdependence of activities and the sequence in which the work is to be accomplished, as planned by the CONTRACTOR. All activities shall be described so that the work elements are readily identifiable and the progress on each activity can be readily measured. No activity, except Maintenance of Traffic (MOT), shall span more than 30 calendar days without the approval of the ENGINEER. The schedule shall include milestones and phased activities as required by the Contract Documents along with shop drawing submittals and the time required for obtaining permits and licenses.

1.03 SCHEDULE APPROVAL

A. After reviewing the preliminary schedule, the City and Engineer shall meet with the Contractor at the pre-construction conference or other meeting called to finalize the Progress Schedule and, thereafter, shall add calendar dates and shall modify and/or correct the schedule until satisfactory to the City, at which time it will be approved for use by the CONTRACTOR for planning, organizing, and directing the work of the project and for determining and reporting progress. Approval of the Progress Schedule will be dependent upon satisfactorily identifying work items, dates and durations in conformance with the terms of the Contract and the Contract Time the City has established. In conjunction with submittal of the Progress Schedule, a schedule of shop drawing and sample submittals shall be presented in accordance with Section 01340.

B. No Request for Payment will be accepted or processed and no interim payment will be made to the CONTRACTOR until the Progress Schedule is acceptable to and approved by the City.

1.04 SCHEDULE UPDATES/REVISIONS

A. If the Contract Time has been changed substantially as a result of time extensions or Supplemental Agreements, the CONTRACTOR shall prepare a revised schedule and written report. The report shall indicate project percent completion, measured in work scope and costs, based on the most recent update of the schedule, and will be the basis for subsequent measurement of job progress and interim payments.

B. The bar chart shall show regularly scheduled monthly progress meetings which will be held in the week prior to the scheduled progress payment application cut-off date so that the basis for determining job progress will coincide with that on which the monthly determination of Contract percent completion is based.

1.05 SCHEDULE COMPLIANCE

A. The CONTRACTOR shall prosecute the work in accordance with the latest approved Progress Schedule. In the event that progress of critical items are delayed due to no fault of the City, the CONTRACTOR shall prepare a written plan describing the methods the CONTRACTOR will use to complete the project within the Contract Time. All additional costs associated therewith will be borne solely by the CONTRACTOR without additional cost to the City. The CONTRACTOR shall submit for approval such supplementary schedules as may be required by the City to demonstrate the manner in which the scheduled progress will be regained.

END OF SECTION 01310

SECTION 01330

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Submit Shop Drawings, Product Data and Samples required by the Contract Documents.

1.02 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

C. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed Shop Drawings, Product Data and Samples will be needed.

1.03 SHOP DRAWINGS

A. Drawings shall be presented in a clear and thorough manner.

1. Details shall be identified by reference to OWNER's Project Number, sheet, detail, intended uses and schedule numbers shown on Contract Drawings.

1.04 PRODUCT DATA

A. Preparation:

1. Clearly mark each copy to identify pertinent products or models.

2. Show performance characteristics and capacities.

3. Show dimensions and clearances required.

4. Show wiring or piping diagrams and controls.

B. Manufacturer's standard schematic drawings and diagrams:

1. Modify Drawings and diagrams to delete information which is not applicable to the WORK.

2. Supplement standard information to provide information specifically applicable to the WORK.

1.05 SAMPLES

A. Office 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.

1.06 CONTRACTOR RESPONSIBILITIES

A. Review Shop Drawings, Product Data and Samples prior to submission.

B. Determine and verify:

1. Field measurements.

2. Field construction criteria.

3. Catalog numbers and similar data.

4. Conformance with specifications.

C. Coordinate each submittal with requirements of the WORK and of the Contract Documents.

D. Notify the ENGINEER in writing, at time of submission, of any deviations in the submittals from requirements of the Contract Documents.

E. Begin no fabrication or WORK which requires submittals until return of submittals with ENGINEER's approval.

1.07 SUBMISSION REQUIREMENTS

A. CONTRACTOR shall furnish to the ENGINEER for review, 4 copies of each shop drawing submittal. The term "Shop Drawing" as used herein shall be understood to include detail design calculations, shop drawings, fabrication and installation drawings, erection drawings, lists, graphs, catalog sheets, data sheets, and similar items.

B. Normally, a separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of a submittal of various items using a single transmittal form will be permitted only when the items taken together constitute a manufacturer's "package" or are so functionally related that expediency indicates review of the group or package as a whole. A multiple-page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the ENGINEER.

C. Except as may otherwise be indicated herein, the ENGINEER will return prints of each submittal to the CONTRACTOR with its comments noted thereon, within fifteen (15) calendar days following their receipt by the ENGINEER. It is considered reasonable that the CONTRACTOR shall make a complete and acceptable submittal to the ENGINEER

by the second submission of a submittal item. The OWNER reserves the right to withhold monies due the contractor to cover additional costs of the ENGINEER's review beyond the second submittal. The ENGINEER's maximum review period for each submittal, including all resubmittals, will be 15 days per submittal. In other words, for a submittal that required two resubmittals before it is complete, the maximum review period for that submittal could be 45 days.

D. If 3 copies of a submittal are returned to the CONTRACTOR marked "NO EXCEPTIONS TAKEN", formal revision and resubmission of said submittal will not be required.

E. If 3 copies of a submittal are returned to the CONTRACTOR marked "NOTE COMMENTS," formal revision and resubmission of said submittal will not be required.

F. If a submittal is returned to the CONTRACTOR marked "RESUBMIT" the CONTRACTOR shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the ENGINEER.

G. If a submittal is returned to the CONTRACTOR marked "REJECTED", the CONTRACTOR shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the ENGINEER.

H. Fabrication of an item shall be commenced only after the ENGINEER and City of Lake Worth have reviewed the pertinent submittals and returned copies to the CONTRACTOR marked either "NO EXCEPTIONS TAKEN" or "NOTE COMMENTS." Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the contract requirements.

I. All CONTRACTOR shop drawing submittals shall be carefully reviewed by an authorized representative of the CONTRACTOR, prior to submission to the ENGINEER. Each submittal shall be dated, signed, and certified by the CONTRACTOR, as being correct and in strict conformance with the Contract Documents. In the case of shop drawings, each sheet shall be so dated, signed, and certified. No consideration for review by the ENGINEER of any CONTRACTOR submittals will be made for any items which have not been so certified by the CONTRACTOR. All non-certified submittals will be returned to the CONTRACTOR without action taken by the ENGINEER, and any delays caused thereby shall be the total responsibility of the CONTRACTOR.

J. The ENGINEER's review of CONTRACTOR shop drawing submittals shall not relieve the CONTRACTOR of the entire responsibility for the correctness of details and dimensions. The CONTRACTOR shall assume all responsibility and risk for any misfits due to any errors in CONTRACTOR submittals. The CONTRACTOR shall be responsible for the dimensions and the design of adequate connections and details.

K. **Shop Drawing Distribution:** Shop drawings shall be reviewed by the ENGINEER and marked either as "NO EXCEPTIONS TAKEN", "NOTE COMMENTS", "RESUBMIT", or "REJECTED". The distribution of processed shop drawings shall be as follows:

1. Shop drawings marked "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED".

   3 copies returned to CONTRACTOR

   2 copies transmitted to the OWNER

   1 copy to remain with the ENGINEER

   2 copies for the Resident Project Representative

2. Shop drawings marked "RESUBMIT" or "REJECTED".

   2 copies returned to CONTRACTOR

   2 copies remain with the ENGINEER

   4 copies to be discarded

L. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.

2. The Project title and Project number.

3. Contract identification.

4. The names of:

   a. CONTRACTOR

   b. Supplier

   c. Manufacturer

5. Identification of the product, with the specification section number.

6. Field dimensions, clearly identified as such.

7. Relation to adjacent or critical features of the WORK or materials.

8. Applicable standards, such as ASTM or Federal Specification numbers.

9. Identification of deviations from Contract Documents.

10. Identification of revisions on resubmittals.

11. An 8" x 3" blank space for CONTRACTOR and ENGINEER's stamps.

12. CONTRACTOR's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and

coordination of the information within the submittal with requirements of the WORK and of Contract Documents.

1.08 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals required by ENGINEER and resubmit until approved.

B. Shop Drawings and Product Data:

1. Revise initial Drawings or data, and resubmit as specified for the initial submittal.

2. Indicate any changes which have been made other than those requested by the ENGINEER.

C. Samples: Submit new samples as required for initial submittal.

1.09 DISTRIBUTION

A. Distribute reproduction of Shop Drawings and copies of Product Data which carry the ENGINEER's stamp of approval to:

1. Job site file.

2. Record Documents file.

3. Other affected CONTRACTORS.

4. Subcontractors

5. Supplier or Fabricator.

B. Distribute samples which carry the ENGINEER's stamp of approval as directed by the ENGINEER.

1.10 ENGINEER DUTIES

A. Review submittals with reasonable promptness and in accord with schedule.

B. Affix stamp and initials or signature, and indicate requirements for resubmittal, or approval of submittal.

C. Return submittals to CONTRACTOR for distribution, or for resubmission.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01330

SECTION 01340

SUBMITTALS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. This Section specifies procedural requirements for non-administrative submittals including shop drawings, calculations, manufacturer's catalog cuts, product data, schematics, equipment and materials lists and schedules, coordination drawings and samples and other work related submittals as necessary to amplify, expand, coordinate information, and satisfy requirements contained in the Contract Documents.

1.02 DATES FOR SUBMISSION AND RETURN

A. Designate in the construction progress schedule, or in a separate coordinated schedule, dates for delivery of submittals to the ENGINEER for review and action.

1.03 SHOP DRAWINGS, PRODUCT DATA, ETC.

A. Submit one reproducible, reverse transparency (sepia or equivalent) together with two prints to be retained by the ENGINEER for each required shop drawing, as follows:

1. Identify each drawing with the following information placed on each drawing:

    a. Project name, CITY's Project number and Date drawing prepared.
    b. Name and address of CONTRACTOR.
    c. Name and address of Subcontractor.
    d. Name of manufacturer.
    e. Number and title of appropriate Specifications Section.
    f. Drawing number and detail references, as appropriate.

2. Leave a blank space six inches wide by four inches high in the lower right corner of the first sheet of the shop drawings for the ENGINEER's shop drawing review stamp.

B. Submit four copies of each catalog cut or product data sheet where reproduction can be accomplished by a direct copy process.

C. Submit samples and such other required submittals for review as indicated in the specific Specification Section for the item.

D. Attach a copy of the CONTRACTOR's transmittal letter to each required shop drawing, manufacturer's catalog cut or other product data. When submitting reverse transparencies, provide six copies of the transmittal forms, one to accompany each such submittal.

1.04 SUBMITTAL IDENTIFICATION

A. Submit only one item or system per letter of transmittal properly identified to include the appropriate specification section and paragraphs.

B. When catalogs, product data, diagrams or charts are submitted with more than one type of product manufactured, identify the particular item, including options, that is intended for use in that phase of work.

C. Identify resubmittal with original shop drawing number and the letter A, B, etc. according with resubmittal order, and direct specific attention to revisions and corrections made, other than those requested on previous submissions.

D. Identify details by reference to sheet and detail or schedule shown on Drawings and to Specifications Section.

1.05 SUBMITTAL COMPLETENESS

A. Submit catalog sheets, product data, shop drawings and where specified, submit calculations, material samples, test data, warranties and guarantees all at same time for each item.

B. Submit shop drawings and samples in technically related submittal groups as for the various disciplines (Architectural, Structural, Electrical, HVAC, Plumbing, etc.). Submit in complete submittal groups where possible.

1.06 SHOP DRAWINGS

A. Submit shop drawings, including drawings, diagrams and schedules, as reproducible transparencies and blue line prints.

B. Distribute copies of the transparencies stamped by the ENGINEER. Submit as multiple copies shop drawing material that cannot be submitted in sepia or other transparent form. Submit same number of copies as required for final distribution of reviewed submittals.

1.07 COORDINATION DRAWINGS

A. Submit coordination drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

1.08 CALCULATIONS

A. Identify calculations by the name and seal of the registered ENGINEER preparing them. Include all assumptions, formulae and constants. Identify relation to design requirements.

1.09 SAMPLES

A. Submit product samples of sufficient size and quantity to illustrate functional characteristics, with integral parts and attachment devices, and full range of color, texture and pattern.

1.10 CONTRACTOR RESPONSIBILITIES

A. Review shop drawings, catalog cuts, product data and samples prior to submission. Determine and verify:

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.
4. Conformance with Specifications.
5. Conformance with drawings and details.

B. Coordinate each submittal with requirements of Work and of Contract Documents. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

C. Notify the ENGINEER in writing at time of submission of any deviations in submittals from requirements of Contract Documents, but do not use the submittal process as a means for substituting products.

D. Do not begin fabrication or Work that requires submittals until after receipt of submittals carrying favorable action by the ENGINEER.

E. Coordinate transmittal of different types of submittals for related elements of the Work so that processing will not be delayed by the need to review submittals concurrently for coordination. The ENGINEER reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

F. Submit shop drawings in sufficient time to allow adequate study, discussion and any necessary correction prior to beginning the Work they cover. No extension of Contract time will be authorized because of failure to transmit submittals to the ENGINEER sufficiently in advance of the Work to permit processing.

G. Prior to sending in any submittals required by the Contract, including those of Subcontractors and Suppliers, review and check each submission for compliance with the Contract requirements and for coordination of the Work as it affects other trades, and stamp and sign approval on each submittal. By approving and submitting each submittal, the CONTRACTOR thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated each submittal with the requirements of the Work and of the Contract Documents.

H. Review, Correction and Final Approval by CONTRACTOR: After reviewing the ENGINEER's comments, make any corrections as appropriate, and resubmit the corrected submittals until no further comment is made by the ENGINEER.

1. Endorse by stamp with date of final approval of the submittal after all reviews by the ENGINEER have been made and all of the ENGINEER's comments have been incorporated or otherwise satisfactorily acted upon.

2. Commence no portion of the Work requiring a submittal until the submittal has CONTRACTOR's final approval stamp and endorsement.

1.11 ENGINEER'S REVIEW

A. The ENGINEER will not review submittals that do not carry the CONTRACTOR's review stamp and approval.

B. The ENGINEER will review submittals only for conformance with the design concept of the Project and with the information given in the Contract Documents.

C. The ENGINEER's review comment relating to a separate item will not indicate review of an assembly in which the item functions.

D. The ENGINEER's review of submittals will not relieve the CONTRACTOR from responsibility for any deviation.

E. The ENGINEER's review of submittals will not relieve the CONTRACTOR from responsibility for errors or omissions in the CONTRACTOR's (or his subcontractor's) preparation of the submittals.

F. The ENGINEER will note that each submittal has been reviewed and will return the submittal to the CONTRACTOR with comments pertaining to design concept of the Project and information given in the Contract Documents.

G. Prior to receipt by CONTRACTOR of ENGINEER's review comments on required submittals, any Work done or materials ordered for the Work involved will be at the CONTRACTOR's risk.

END OF SECTION 01340

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 TESTING LABORATORY

A. Unless otherwise specified, CONTRACTOR shall engage and pay for the services of an independent testing laboratory to perform the specified testing and inspection activities. However, neither the engagement of a testing laboratory and performance of the required inspections and tests, nor the failure of such inspections and tests to disclose deficiencies, shall relieve CONTRACTOR's obligations to perform the Work in full compliance with the requirements of the Contract.

B. Laboratory selection shall be subject to approval by the CITY. The CONTRACTOR shall submit to the CITY for selection of one firm, the names and qualifications of at least three independent testing laboratories that are pre-qualified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories and which are recognized in the industry as specialized in the types of inspections and tests to be performed. The CONTRACTOR shall not change testing laboratories without prior approval by the CITY.

1.02 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.

1.03 LABORATORY DUTIES

A. Cooperate with ENGINEER and CONTRACTOR; provide qualified personnel after due notice.

B. Perform specified inspections, sampling and testing of materials and methods of construction:

1. Comply with specified standards.

2. Ascertain compliance of materials with requirements of Contract Documents.

C. Promptly notify ENGINEER and CONTRACTOR of observed irregularities of deficiencies of work or products.

D. Promptly submit written report of each test and inspection; one copy each to ENGINEER, OWNER, CONTRACTOR, and one copy to Record Document File. Each report shall include:

1. Date issued.

2. Project title, number and Parcel number.

3. Testing laboratory name, address and telephone number.

4. Name and signature of laboratory inspector.

5. Date and time of sampling or inspection.

6. Record of temperature and weather conditions.

7. Date of test.

8. Identification of fill product and specification section.

9. Location of sample or test in the project.

10. Type of inspection or test.

11. Results of tests and compliance with Contract Documents.

12. Interpretation of test results, when requested by ENGINEER.

E. Perform additional tests as required by the ENGINEER.

1.04 CONTRACTOR'S RESPONSIBILITIES

A. CONTRACTOR shall cooperate with and provide services to the inspection and testing personnel, including assistance in accessing the Work, taking and delivering of samples, providing access to manufacturer's operations, if required, furnish incidental labor and facilities and other assistance as needed to facilitate performance of the required services.

B. CONTRACTOR shall notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

C. CONTRACTOR shall furnish copies of all test reports on products, and the results of all inspections and tests conducted by the laboratory to the ENGINEER as required.

D. The following tests, if applicable, will be paid for by the CONTRACTOR.

a. Density (every 100 feet of pipeline)
b. Proctor
c. LBR
d. Carbonate Content
e. Gradation
f. Plastic Index and Liquid Limit
g. Organic Content
h. Concrete Compressive Strength and Slump
i. Asphalt Extraction
j. Bacteriological Testing

1.05 TESTING COST PAYMENT

A. Certain tests of materials, compaction tests, construction inspection results and equipment are required and shall be conducted as specified in these specifications. Upon delivery by the CONTRACTOR to the CITY of the laboratory's "paid" invoices for tests that signify conformance with the Contract Documents, the CITY will include payment therefore in the CONTRACTOR's next interim pay estimate. CONTRACTOR should note that CITY will pay the costs of only such tests that indicate conformance with specifications requirements. CITY will neither be liable nor make payment for tests specified in Contract Documents that register non-compliance with specified requirements.

1.06 TESTING COSTS PAID FOR BY CONTRACTOR

A. CONTRACTOR shall pay for all tests specified in Contract Documents that are conducted by and invoiced by the selected testing laboratory and shall forward to the CITY the laboratory receipts or paid invoices for all specified tests that signify compliance with the Contract Documents for inclusion in the next interim payment. The CONTRACTOR shall also pay to the testing laboratory the costs of all tests and inspections that register non-compliance with specified requirements and shall provide to the CITY evidence of such payments along with those that were satisfactory but shall clearly distinguish between them. The CONTRACTOR shall include the testing laboratory's final release of lien in the CONTRACTOR's Final Application for Payment.

B. The CONTRACTOR shall pay for tests not specified in Contract Documents, but determined by CONTRACTOR to be of his benefit and ordered by him.

C. The CONTRACTOR shall pay the costs of all tests necessary to satisfy ENGINEER that substitute materials or equipment meets the specified requirements.

END OF SECTION 01410

SECTION 01420

REFERENCE STANDARDS

PART 1 - GENERAL

1.01 GENERAL

A. **Titles of Sections and Paragraphs:** Captions accompanying specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.

B. **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.

C. **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 requirements 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. Nevertheless, 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 applicable codes and the applicable requirements of the following documents.

B. References herein to "Building Code" shall mean "Florida Building Code". Reference to "Uniform Building Code" shall mean Uniform Building Code of the International Conference of Building Officials (ICBO). Similarly, references to "Mechanical Code" or "Uniform Mechanical Code," "Plumbing Code" or "Uniform Plumbing Code," "Fire Code" or "Uniform Fire Code," shall mean Uniform Mechanical Code, Uniform Plumbing Code and Uniform Fire Code of the International Conference of the Building Officials (ICBO). "Electric Code" or "National Electric Code (NEC)" shall mean the National Electric Code of the National Fire Protection Association (NFPA). The latest edition of the codes as approved by the Municipal Code and used by the local agency as of the date that the WORK is advertised for bids, as adopted by the agency having

jurisdiction, shall apply to the WORK herein, including all addenda, modifications, amendments, or other lawful changes thereto.

C. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the ENGINEER for clarification and directions prior to ordering or providing any materials or furnishing labor. The CONTRACTOR shall bid for the most stringent requirements.

D. The CONTRACTOR shall construct the WORK specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed herein.

E. **Applicable Standard Specifications**: References in the Contract Documents to "Standard Specifications" shall mean Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.

F. References herein to "OSHA Regulations for Construction" shall mean **Title 29, Part 1926, Construction Safety and Health Regulations,** Code of Federal Regulations (OSHA), including all changes and amendments thereto.

G. 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.

H. References to "Minimum Standards" shall mean the minimum standards required by the authority having jurisdiction over the respective area or facilities.

1.03 REGULATIONS RELATED TO HAZARDOUS MATERIALS

A. The CONTRACTOR is responsible that all work included in the Contract Documents, regardless if shown or not, shall comply with all EPA, OSHA, RCRA, NFPA, and any other Federal, State, and Local Regulations governing the storage and conveyance of hazardous materials, including petroleum products.

B. Where no specific regulations exist, all chemical, hazardous, and petroleum product piping and storage in underground locations must be installed with double containment piping and tanks, or in separate concrete trenches and vaults, or with an approved lining which cannot be penetrated by the chemicals, unless waived in writing by the OWNER.

PART 2 - PRODUCTS
(Not Applicable)

PART 3 - EXECUTION
(Not Applicable)

END OF SECTION 01420

SECTION 01510

TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide and maintain temporary utilities required for construction for the duration of the project and remove on completion of Work.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with National Electric Code.

B. Comply with Federal, State and Local codes and regulations and with utility company requirements.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Use materials, new or used, that are adequate in capacity for the required usage, that do not create unsafe conditions, and that do not violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY

A. Arrange with utility company to provide the service required and pay all costs for service and for power used.

B. Install circuit and branch wiring, with area distribution boxes located so that power is available throughout the construction by the use of construction-type power cords.

1. Provide power centers for miscellaneous tools and equipment as required.

2. Provide power for construction equipment.

3. Provide power for testing and checking equipment.

4. Provide power for welding units and for other equipment having special power requirements.

C. Provide adequate electrical service distribution for construction use by all trades during construction period. Notify utility company if unusually heavy loads, such as welding and other special power requirements, will be connected. Provide special circuits for heavy load requirements.

D. Maintain strict supervision of use of temporary services. Enforce conformance with applicable standards and safe practices. Prevent abuse of services.

E. Comply with the National Electrical Code, National Electrical Safety Code, National Fire Protection Association and all applicable Federal, state and local codes and utility company regulations.

2.03 TEMPORARY WATER

A. Arrange with utility service company, provide water for construction purposes, pay all costs for installation, maintenance and removal, and service charges for water used.

B. Install branch piping with taps located so that water is available throughout the construction by the use of hoses.

C. Provide potable water service with approved backflow prevention devices for construction personnel

D. Provide portable containers to dispense drinking water, with temperature maintained between 45 degrees F and 55 degrees F.

2.04 TEMPORARY SANITARY FACILITIES

A. Provide sanitary facilities in compliance with laws and regulations.

B. Provide enclosed toilet facilities for construction personnel. Place in location secluded from public and convenient for use of personnel in relation to work areas.

C. Provide general employee washing facilities, similarly located.

D. Maintain strict supervision of use of facilities, enforce conformance with applicable standards, maintain, service and clean facilities and enforce proper use of sanitary facilities.

PART 3 - EXECUTION

3.01 GENERAL

A. Coordinate locations of temporary sanitary facilities with City.

B. Maintain and operate systems to assure continuous services.

C. Modify and extend systems as work progress requires.

3.02 TEMPORARY WATER

A. Locate piping and outlets to avoid interference with traffic and other work and storage areas and do not run piping on floor or on ground.

3.03 TEMPORARY ELECTRICITY

A. Install temporary service and distribution either overhead or underground.

B. Locate to avoid interference with traffic and other work and storage areas.

C. Do not run branch circuits on floor or on ground.

D. Wire all safety devices required for operation of equipment.

E. Check operation of safety devices.

3.04 TEMPORARY SANITARY FACILITIES

A. Erect portable toilets securely and anchor to prevent dislocation. Service toilets as often as necessary to prevent accumulation of wastes and creation of unsanitary conditions. Provide faucet for washing.

3.05 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

END OF SECTION 01510

SECTION 01561

PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.01 GENERAL

A. 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.

B. The CONTRACTOR shall verify the exact locations and depths of all utilities shown and the CONTRACTOR shall make exploratory excavations of all utilities that may interfere with the WORK. All such exploratory excavations shall be performed as soon as practicable after award of the contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the CONTRACTOR's work. When such exploratory excavations show the utility location as shown to be in error, the CONTRACTOR shall so notify the ENGINEER.

C. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.

1.02 RIGHTS-OF-WAY

A. The CONTRACTOR shall not do any work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; or any other structure, nor shall the CONTRACTOR enter upon the rights-of-way involved until notified by the ENGINEER that the OWNER has secured authority therefore from the proper party. After authority has been obtained, the CONTRACTOR shall give said party due notice of its intention to begin work, if required by said party, and shall remove, shore, support or otherwise protect such pipeline, transmission line, ditch, fence, or structure or replace the same. When two or more contracts are being executed at one time on the same or adjacent land in such manner that work on one contract may interfere with that on another, the OWNER shall determine the sequence and order of the WORK. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the OWNER to the CONTRACTOR so desiring, to the extent, 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.

1.03 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. All survey markers or points disturbed by the CONTRACTOR shall be accurately restored after all street or roadway resurfacing has been completed.

1.04 RESTORATION OF PAVEMENT/SIDEWALKS

A. **General:** All paved areas including asphaltic concrete berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent pavement shall conform to the requirements of the affected pavement OWNER. All pavements which are subject to partial removal shall be neatly saw cut in straight lines.

B. **Temporary Resurfacing:** Wherever required by the public authorities having jurisdiction, the CONTRACTOR shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.

C. **Permanent Resurfacing:** In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

D. **Restoration of Sidewalks or Private Driveways:** Wherever sidewalks or private roads have been removed for purposes of construction, the CONTRACTOR shall place suitable temporary sidewalks or roadways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions before proceeding with the final restoration or, if no such period of times is so fixed, the CONTRACTOR shall maintain said temporary sidewalks or roadways until the final restoration thereof has been made. The CONTRACTOR shall replace any damage to existing sidewalks that are to remain at no cost to the City.

1.05 EXISTING UTILITIES AND IMPROVEMENTS

A. **General:** 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.

B. **Utilities to be Moved:** 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 CONTRACTOR 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.

C. 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, at the CONTRACTOR's expense, 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.

D. **OWNER's Right of Access:** The right is reserved to the OWNER and to the OWNERs of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the WORK of this Contract.

E. **Underground Utilities Indicated:** 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.

F. **Underground Utilities Not Indicated:** In the event that the CONTRACTOR damages any existing utility lines that are not indicated or the locations of which are not made known to the CONTRACTOR by Florida One Call prior to excavation, a written report thereof shall be made immediately to the ENGINEER. If directed by the ENGINEER, repairs shall be made by the CONTRACTOR under the provisions for changes and extra work contained in the General Conditions of the Contract. The CONTRACTOR shall be responsible for all repair or relocation costs for any failure by the CONTRACTOR to contact appropriate utilities for locations prior to digging.

G. **Approval of Repairs:** All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement OWNER and the ENGINEER before being concealed by backfill or other work.

H. **Maintaining in Service:** All oil and gasoline pipelines, power, and 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 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.

I. **Existing Water Services:** CONTRACTOR shall protect and provide temporary support for existing water services. Any water service damaged by the CONTRACTOR, shall be replaced at the CONTRACTOR's expense, with a new water service complete with new water main tap.

1.06 TREES WITHIN STREET RIGHTS-OF-WAY AND PROJECT LIMITS

A. **General:** The CONTRACTOR shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs, including those lying within street rights-of-way and project limits, and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the jurisdictional agency or OWNER. All existing trees and shrubs which are damaged during construction shall be trimmed or replaced by the CONTRACTOR or a certified tree company under permit from the jurisdictional agency and/or the OWNER. Tree trimming and replacement shall be accomplished in accordance with the following paragraphs. All trees to remain in right-of-way shall be protected and fenced with orange barricade fencing.

B. **Trimming:** Symmetry of the tree shall be preserved; no stubs or splits or torn branches left; clean cuts shall be made close to the trunk or large branch. Spikes shall not be used for climbing live trees. All cuts over 1-1/2 inches in diameter shall be coated with an asphaltic emulsion material.

C. **Replacement:** The CONTRACTOR shall immediately notify the jurisdictional agency and/or the OWNER if any tree is damaged by the CONTRACTOR's operations. If, in the opinion of said agency or the OWNER, the damage is such that replacement is necessary, the CONTRACTOR shall replace the tree at its own expense. The tree shall be of a like size and variety as the tree damaged, or, if of a smaller size, the CONTRACTOR shall pay to the OWNER of said tree a compensatory payment acceptable to the tree OWNER, subject to the approval of the jurisdictional agency or OWNER. The size of the trees shall be not less than 1-inch diameter nor less than 6 feet in height.

1.07 NOTIFICATION BY THE CONTRACTOR

A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting

facilities; and all roadway and state highway rights-of-way the CONTRACTOR shall notify the respective authorities representing the OWNERs or agencies responsible for such facilities not less than 3 days nor more than 7 days prior to excavation so that a representative of said OWNERs or agencies can be present during such work if they so desire. The CONTRACTOR shall also contact 811 at least 2 days, but no more than 14 days, prior to such excavation.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards.

2.02 FENCING

A. Materials to CONTRACTOR's option, minimum fence height is 6 feet.

2.03 BARRIERS

A. Materials to CONTRACTOR's option, as appropriate to serve required purpose.

PART 3 - EXECUTION

3.01 GENERAL

A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for required purposes.

B. Maintain barriers during entire construction period.

C. Relocate barriers as required by progress of construction.

3.02 TREE AND PLANT PROTECTION

A. Preserve and protect existing trees and plants adjacent to work areas.

B. Consult with OWNER's Representative and remove agreed-on roots and branches which interfere with work:

1. Employ qualified tree surgeon to remove branches, and to treat cuts.

C. Protect root zones of trees and plants:

1. Do not allow vehicular traffic and parking.

2. Do not store materials or products.

3. Prevent dumping of refuse or chemically injurious materials or liquids.

4. Prevent puddling or continuous running water.

D. Carefully supervise all work to prevent damage.

E. Replace trees and plants which are damaged or destroyed due to work operations under this contract.

3.03 REMOVAL

A. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by OWNER's Representative.

B. Clean and repair damage caused by installation, fill and grade areas of the site to required elevations and slopes, and clean the area.

END OF SECTION 01561

SECTION 01570

MAINTENANCE OF TRAFFIC

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Provide all items necessary to protect, warn and/or maintain vehicular and pedestrian traffic during the course of construction.

B. The CONTRACTOR shall arrange for the services of a Traffic Engineer/Consultant, registered as a Professional Engineer in the State of Florida or Certified by the State of Florida, to prepare detailed Maintenance of Traffic (MOT) Plans for permit approval by the City of Lake Worth and other governmental agencies having jurisdiction prior to the start of construction activities.

C. The Maintenance of Traffic Plan and all traffic warning and control devices shall conform to the applicable provisions of the latest editions of the national "Manual On Uniform Traffic Control Devices" (MUTCD), the 600 series of the Florida Department of Transportation's "Roadway and Traffic Design Standards", and Palm Beach County's Minimum Standards Applicable to Public Rights of Way Under Palm Beach County Jurisdiction".

D. There will be no separate payment for the fee for Engineering Services, if required.

1.02 TRAFFIC PLAN

A. The CONTRACTOR shall submit the detailed MOT Plans to the ENGINEER and City of Lake Worth, for review and permit approval, **two week** before the Pre-Construction Meeting. The detailed MOT Plans must identify at a minimum; each phase of the work, traffic flows during each phase, the proposed location of construction signs, channelizing devices, temporary pavement markings and symbols, lighting devices, barrier walls, modifications to traffic signals and all other required devices as applicable. No work within the public right-of-way shall commence until the detailed M.O.T. Plans have been approved in writing by all governmental agencies having jurisdiction. Upon the start of construction, the CONTRACTOR shall comply with all provisions of the detailed Maintenance of Traffic Plans. In the event of non-compliance by the CONTRACTOR, the CONSULTANT will have the authority to order the CONTRACTOR to cease construction operations without compensation of time or money until the violations have been corrected.

B. The detailed Maintenance of Traffic Plan shall include provisions for pedestrian traffic as well as vehicular (including bus) traffic.

C. The Maintenance of Traffic Plan shall show and describe proposed location and time durations of the following as applicable:

1. Public vehicular traffic routing.

2. Traffic blockage and lane closings anticipated due to construction operations.

3. Staging/storage areas and haulage routes.

4. Allowable on-street parking in vicinity of work site.

5. Access to buildings adjacent to work site.

6. Driveways which will be blocked by construction operations.

7. Temporary commercial and industrial loading and unloading zones.

8. Temporary traffic control and channelizing devices and markings.

9. Individual street closings with locations and time durations.

10. Detour facilities.

PART 2 - PRODUCTS

2.01 TRAFFIC CONTROL AND CHANNELIZING DEVICES

A. Provide devices complying with the standards referenced in 1.01 C above as applicable.

PART 3 - EXECUTION

3.01 MAINTENANCE OF TRAFFIC

A. The CONTRACTOR, at all times, shall conduct the work in such a manner as to insure the least obstruction to traffic as is practical. The safety and convenience of the general public and of the businesses adjacent to the work shall be provided for in a satisfactory manner, as determined by the ENGINEER and the City of Lake Worth.

B. Sidewalks, gutters, drains, fire hydrants and private drives shall, insofar as practical, be kept in good condition for their intended uses. Fire hydrants on or adjacent to the work shall be kept accessible to fire apparatus at all times, and no material or obstruction shall be placed within ten (10) feet of any such hydrant.

C. Construction materials temporarily stored within the road right-of-way shall be placed so as to cause as little obstruction to the general public as is reasonably possible.

D. Streets shall not be closed, except in accordance with the approved MOT Plans, and whenever the street is not closed, the work must be conducted with the provision for a safe passageway for vehicular and pedestrian traffic at all times. The CONTRACTOR shall make all necessary arrangements with the City, the ENGINEER, PBCTED, and FDOT concerning maintenance of traffic and selection of detours required.

E. All existing regulatory and information signs and traffic signals shall be maintained by the CONTRACTOR for as long as deemed necessary by the CONSULTANT. If any signs or signals are damaged or lost during the construction period, such signs and signals shall be repaired or replaced by the CONTRACTOR at CONTRACTOR's expense.

3.02 DIVERSION/DETOURING OF TRAFFIC

A. When permission has been granted to close an existing roadway, the CONTRACTOR shall furnish and erect signs, channelizing devices, lights, flags and other protective devices, which shall conform to the requirements of Par. 1.01 C, and be subject to the approval of the City and the ENGINEER. The CONTRACTOR shall furnish and maintain proper protective devices at such locations for the entire time of closure as the CONSULTANT may direct.

B. The CONTRACTOR shall furnish a sufficient number of protective devices 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 City and/or ENGINEER shutting down the work, until the CONTRACTOR provides the necessary protection.

C. Any time traffic is diverted for a period of time that will exceed one work day temporary pavement markings will be required. Existing pavement markings that conflict with the new work zone traffic pattern must be obliterated. Painting over existing pavement markings (black out) is not permitted.

D. The CONTRACTOR may be required to reposition existing traffic signal heads in order to maintain traffic flows at diverted intersections. If this should be necessary, the CONTRACTOR must submit a plan for approval showing the course of work, and the planned repositioning. City of Lake Worth Engineering Department must approve the plan prior to implementation. No separate payment for repositioning the existing traffic signal heads will be made.

END OF SECTION 01570

SECTION 01571

TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Provide and maintain methods, equipment, and temporary construction, as necessary, to provide controls over environmental conditions at the construction site and related area under CONTRACTOR's control; remove physical evidence of temporary facilities at completion of work.

1.02 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

1.03 NOISE CONTROL

A. Provide all necessary requirements for noise control during the construction period.

1. Noise procedures shall conform to all applicable OSHA requirements and local ordinances having jurisdiction on the work.

2. Noise levels during night time hours shall not exceed 55 db measured at the property line of a residence.

1.04 DUST CONTROL

A. Provide positive methods and apply dust control materials to minimize raising dust from construction operations, and provide positive means to prevent air-borne dust from dispersing into the atmosphere.

1.05 WATER CONTROL

A. Provide methods to control surface water to prevent damage to the project, the site, or adjoining properties.

1. Control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff.

B. Provide, operate and maintain hydraulic equipment of adequate capacity to control surface and water.

C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas.

1.06 PEST CONTROL

A. Provide pest control as necessary to prevent infestation of construction or storage area.

1. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.

2. Should the use of pesticides be considered necessary, submit an informational copy of the proposed program to OWNER with a copy to ENGINEER. Clearly indicate:

a. the area or areas to be treated.

b. the pesticide to be used, with a copy of the manufacturer's printed instructions.

c. the pollution preventative measures to be employed.

B. The use of any pesticide shall be in full accordance with the manufacturer's printed instructions and recommendations.

1.07 RODENT CONTROL

A. Provide rodent control as necessary to prevent infestation of construction or storage area.

1. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties

2. Should the use of rodenticide be considered necessary, submit an informational copy of the proposed program to OWNER with a copy to OWNER's Representative. Clearly indicate:

a. the area or areas to be treated.

b. the rodenticide to be used, with a copy of the manufacturer's printed instructions.

c. the pollution preventative measures to be employed.

B. The use of any rodenticide shall be in full accordance with the manufacturer's printed instructions and recommendations.

1.08 DEBRIS CONTROL

A. Maintain all areas under CONTRACTOR's control free of extraneous debris.

B. Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking area, or along access roads and haul routes.

1. Provide containers for deposit of debris as specified in the Contract Documents.

2. Prohibit overloading of trucks to prevent spillage on access and haul routes.

a. Provide periodic inspection of traffic areas to enforce requirements.

C. Schedule periodic collections and disposal of debris as specified in the Contract Documents.

1. Provide additional collections and disposal of debris whenever the periodic schedule is inadequate to prevent accumulation.

1.09 POLLUTION CONTROL

A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.

B. Provide equipment and personnel, perform emergency measures required to contain any spillage, and to remove contaminated soils or liquids.

1. Excavate and dispose of any contaminated earth off-site in accordance with regulatory requirements and replace with suitable compacted fill and topsoil.

C. Take special measures to prevent harmful substances from entering public waters.

1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams or in sanitary or storm sewers.

D. Provide systems for control of atmospheric pollutants.

1. Prevent toxic concentrations of chemicals.

2. Prevent harmful dispersal of pollutants into the atmosphere.

1.10 EROSION CONTROL

A. Plan and execute construction and earthwork, by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas to prevent erosion and sedimentation.

1. Hold the areas of bare soil exposed at one time to a minimum.

2. Provide temporary control measures such as berms, dikes and drains.

3. Provide silt screens as required to prevent surface water contamination.

B. Construct fills and waste areas by selective placement to eliminate surface silts which will erode.

C. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01571

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 MATERIALS, PRODUCTS AND EQUIPMENT INCORPORATED IN THE WORK

A. Provide material, products and equipment that conform to the Specifications and Drawings.

B. Manufactured and fabricated products shall comply with referenced standards, and the approved shop drawings. Like parts of duplicate units shall be manufactured to standard sizes and gauges to make them interchangeable. Similar items by one manufacturer shall match.

C. Use materials, products and items of equipment only for the purposes for which they are designed and specified.

1.02 MANUFACTURER'S INSTRUCTIONS

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, provide copies of such instructions to parties involved in installation, including two copies to ENGINEER. Maintain one set of complete instructions at job site during installation and until completion. Handle, install, connect and adjust products in accordance with manufacturer's instructions and the specifications.

1.03 TRANSPORTATION AND HANDLING

A. Arrange deliveries of products in accordance with construction schedules. Avoid conflict with work and site conditions. Immediately upon delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals and that products are properly protected and undamaged.

1.04 STORAGE AND PROTECTION

A. Interior Storage: Store products in accordance with manufacturer's printed instructions, with seals and labels intact and legible.

B. Exterior Storage:

1. Store fabricated products above ground, on blocking or skids to prevent soiling or staining. Cover products which are subject to deterioration with waterproof covers, provide adequate ventilation to avoid condensation.

2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Protect materials and products while in storage and arrange storage to provide easy access for inspection. Make inspections of stored products to assure that products are maintained under specified conditions and are free from damage or deterioration.

D. Protection After Installation: Protect installed products from damage from traffic and construction operations. Remove coverings when no longer needed.

1.05 SPECIFIED PRODUCTS, PRODUCT OPTIONS AND SUBSTITUTIONS

A. Products Listed: Immediately after Contract award, submit to ENGINEER a complete list of products that the CONTRACTOR proposes to provide, with name of manufacturer and installing subcontractor.

B. CONTRACTOR's Options:

1. Where products are specified by reference standard only, select any product which complies with the requirements of the standard.

2. Where the Specifications require compliance with indicated performance requirements, select any product that complies with the specified performance requirements, provided no product names are indicated.

3. Where products are specified by naming several products or manufacturers, select any one of the products or manufacturers named.

4. For products specified by naming one or more products and/or manufacturers, followed by the words "or equal" or similar language, any product submitted as such an equal will be treated as a substitution.

5. For products specified by naming only one product and manufacturer, or where "no substitution" is indicated, there is no option.

C. Product Substitutions: For a period of 30 days after Contract award date, ENGINEER will consider written requests from CONTRACTOR for substitution of products.

D. Submit a Request for Substitution of Product only after the CONTRACTOR:

1. Has investigated the proposed product and determined that it is equal to or superior to specified product, furnishes a certification to that effect and waives all rights to additional payment or time that may subsequently become necessary due to the failure of the substituted product to perform adequately.

2. Agrees to provide same warranties or bonds for product substitution as for product specified.

3. Agrees to be responsible for coordinating and paying for any necessary changes to other work required by approved substitutions or product options which he selects and shall pay all such costs including the costs of the services of the design professional to revise the Contract Documents, if such revisions are required.

4. Waives all claims for additional costs due to substitution which may subsequently become apparent.

5. Is offering either a substantial credit to the CITY for acceptance of the substitution or a convincing justification that the product to be provided as the substitution is substantially superior in quality, performance, compatibility with adjacent products, durability, vandal-resistance or in other important ways.

E. ENGINEER's Action:

1. Engineer will review requests for substitutions with reasonable promptness and notify CONTRACTOR in writing of CITY's decision to accept or reject requested substitutions. Only the CITY may accept a substitution.

2. Substitution requests made by means of shop drawings or product data submittal will not be considered.

3. After the period of 30 days has elapsed, the only substitution requests which will be considered are those which are made necessary by the removal of the specified products from the market or by other similar, unavoidable circumstances beyond the control of the CONTRACTOR.

END OF SECTION 01600

SECTION 01630

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Contractor's options in selection of products.

B. Products list.

C. Requests for substitution of products.

1.02 CONTRACTOR'S OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards.

B. Products Specified by Naming One or More Manufacturers with a Substitution Paragraph: Submit a request for substitution for any manufacturers not specifically named.

C. Products Specified by Naming Several Manufacturers: Products of named manufacturers meeting specifications; no options, no substitutes.

D. Products Specified by Naming Only One Manufacturer: No option; no substitutions allowed.

1.03 PRODUCTS LIST

A. Within fifteen (15) days after Notice of Award, transmit three (3) copies of a list of products which are proposed for installation, including name of manufacturers.

B. Tabulate products by Specifications Section Number, title and Article Number.

C. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

D. ENGINEER will reply in writing within ten (10) days stating whether there is reasonable objection to listed items. Failure to object to a listed item shall not constitute a waiver of requirements of Contract Documents.

1.04 LIMITATIONS ON SUBSTITUTIONS

A. During bidding period, Instructions to Bidders govern times for submitting requests for substitutions under requirements specified in this section.

B. Requests for substitutions of products will be considered only within fifteen (15) days after date of OWNER-CONTRACTOR Agreement. Subsequent requests will be considered only in case of product unavailability or other conditions beyond control of Contractor.

C. Substitutions will not be considered when indicated on shop drawings or product data submittals without separate formal request, when requested directly by subcontractor or supplier, or when acceptance will require substantial revision of Contract Documents.

D. Substitute products shall not be ordered or installed without written acceptance.

E. Only one (1) request for substitution for each product will be considered. When substitution is not accepted, provide specified product.

F. ENGINEER will determine acceptability of substitutions.

1.05 REQUESTS FOR SUBSTITUTIONS

A. Submit separate request for each substitution. Document each request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents.

B. Identify product by specification Section and Article Numbers. Provide manufacturer's name and address, trade name of product, and model of catalog number. List fabricators and suppliers as appropriate.

C. Attach product data as specified in Section 01330.

D. List similar projects using product, dates of installation, and names of ENGINEER and OWNER.

E. Give itemized comparison of proposed substitution with specified product, listing variations, and reference to Specifications section and Article numbers.

F. Give quality and performers comparison between proposed substitution and the specified product.

G. Give cost data comparing proposed substitution with specified product, and amount of net change to Contract Sum.

H. List availability of maintenance services and replacement materials.

I. State effect of substitution on construction schedule, and changes required in other work of products.

1.06 CONTRACTOR REPRESENTATION

A. Request for substitution constitutes a representation that CONTRACTOR has investigated proposed product and has determined that it is equal to or superior in all respects to specified product or that the cost reduction offered is ample justification for accepting the offered substitution.

B. CONTRACTOR will provide same warranty for substitution as for specified product.

C. CONTRACTOR will coordinate installation of accepted substitute, making such changes as may be required for work to be complete in all respects.

D. CONTRACTOR certifies that cost data presented is complete and includes all related costs under this Contract.

E. CONTRACTOR waives claims for additional costs related to substitution which may later become apparent.

1.07 SUBMITTAL PROCEDURES

A. Submit three (3) copies of request for substitution.

B. ENGINEER will review Contractor's requests for substitutions with reasonable promptness.

C. During the bidding period, ENGINEER will record acceptable substitutions in Addenda.

D. After award of Contract, ENGINEER will notify CONTRACTOR, in writing, of decision to accept or reject requested substitutions in Addenda.

E. For accepted products, submit shop drawings, product data, and samples in accordance with and Section 01330.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01630

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Work of Contract Closeout consists of completion of project requirements that must be fulfilled near the end of the Contract Time in preparation for final acceptance and occupancy of the project by the CITY as well as final payment to the CONTRACTOR and normal termination of the Contract.

1.02 SUBSTANTIAL COMPLETION

A. When CONTRACTOR determines that the Work is substantially complete, he shall submit to ENGINEER a written notice that the Work or designated portion thereof, is substantially complete. The notice shall be accompanied by a report of the results of inspection, testing and adjustments of the completed systems, a list of items to be completed or corrected, the required record closeout documents and all special tools, spare parts, extra stock, maintenance materials, keys and similar operational items, as applicable.

B. ENGINEER will review the documents submitted and, accompanied by the CONTRACTOR, will conduct a construction review to determine the status of completion. If incomplete, the CONTRACTOR shall remedy the deficiencies encountered and the ENGINEER will again review the Work.

C. The process will be repeated until ENGINEER determines that the Work is substantially complete, at which time he will issue to CONTRACTOR, with copy to CITY, a Certificate of Substantial Completion along with a punchlist of items to be completed or corrected. If, upon Substantial Completion the CITY occupies the Work, the CITY will allow CONTRACTOR reasonable access to complete or correct punchlist items and other related Work.

D. In the event such occupancy by the CITY is planned, the Certificate of Substantial Completion shall include a written recommendation as to the division of responsibilities and liabilities pending final acceptance between CITY and CONTRACTOR with respect to security, operation, safety, maintenance, utilities, insurance, warranties and guarantees for their written acceptance. However, no occupancy or separate operation of part of the Work will be accomplished prior to compliance with Contract requirements in respect of property insurance. No such use or occupancy shall commence before the insurers have acknowledged notice thereof and in writing effected the changes in coverage necessitated thereby by endorsement on the property insurance policy or policies. Such policy or policies shall not be cancelled or lapse on account of any such partial use or occupancy.

1.03 FINAL CONSTRUCTION REVIEW

A. When Work is complete, including the punchlist items, CONTRACTOR shall notify ENGINEER in writing that the Work is completed and ready for final construction review. ENGINEER, accompanied by the CONTRACTOR, will make a final construction review to verify status of completion with reasonable promptness and when satisfied that the Work is acceptable under the Contract Documents, he will so advise CITY and CONTRACTOR.

B. If, during construction operations or during construction reviews for substantial or final completion, the ENGINEER should fail to reject defective Work or materials, such failure to reject shall in no way prevent his later rejection when such defect is discovered, or obligate CITY to final acceptance. CONTRACTOR shall make no claim for losses suffered due to any necessary removals or repairs of such defects.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS

A. Upon receipt of notice of acceptability from ENGINEER, CONTRACTOR shall assemble, for submittal along with the Final Application for Payment, evidence of compliance with requirements of governing authorities and Contract Documents, as follows:

1. Project Record Documents including As-built Drawings and Specifications, Addenda, Construction Schedule, Change Orders and other modifications of the Contract, Approved Shop Drawings, Product Data and Samples, and Field Test records.

2. Operating and Maintenance Instructions: Submit instructions and/or manuals for operating equipment and systems as prepared in accordance with the requirements of the applicable equipment specifications sections.

3. Warranties and Bonds: As applicable and in accordance with the requirements of the individual sections of the specifications.

4. Evidence of payment to subcontractors, testing laboratories, material men and equipment suppliers and releases of liens therefrom.

B. During the construction process, CONTRACTOR shall maintain records of all deviations from the Plans and Specifications and prepare therefrom Record Drawings showing correctly and accurately all changes and deviations made during construction to reflect the Work as it was actually constructed. The record drawings shall identify all underground piping and ductwork with elevations and dimensions and locations of valves, pull boxes, etc., changes in location, horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements, actual installed pipe material, class, etc. CONTRACTOR shall prepare these drawings to conform to recognized standards of drafting, to be neat, legible and on standard size project plan sheets. As a prerequisite for monthly progress payments, CONTRACTOR shall submit, simultaneously with the progress payment request, a copy of the currently updated Record Drawings for

review by the ENGINEER. Final payment to the CONTRACTOR will not be made until the completed set of record drawings, signed and sealed by a professional engineer or land surveyor registered in the State of Florida and approved by the ENGINEER as to form and accuracy has been delivered to the CITY.

1.05 FINAL ADJUSTMENTS OF ACCOUNTS

A. CONTRACTOR shall submit a final statement of accounting along with the Final Application for Payment to ENGINEER, reflecting all adjustments to Contract Sum and the ENGINEER, upon verifying the claim, will submit the approved document to CITY for payment.

END OF SECTION 01700

DIVISION 2 – SITE WORK

SECTION 02210

SUBSURFACE INVESTIGATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the subsurface investigation work, as required for the satisfactory completion of the WORK.

B. The subsurface investigation for conditions of the project site is the sole responsibility of the CONTRACTOR. In preparing the Bid, the CONTRACTOR shall make all subsurface or surface investigations necessary to provide proper background and knowledge to determine the nature and extent of work required.

C. OWNER or ENGINEER has provided available subsurface information in Exhibit A and makes no warranties or guarantees concerning the existing underground utilities or nature of materials to be encountered on the site.

1.03 RELATED WORK

A. Section 02230 - Site Clearing.

B. Section 02300 - Earthwork.

1.04 MEASUREMENT AND PAYMENT

A. There shall be no special measurement or payment for the work under this section, it shall be included in the lump sum price for bid item - Mobilization.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 02210

SECTION 02220

CONSTRUCTION VIDEOGRAPHY

PART 1 - GENERAL

1.01 GENERAL

A. Employ professional videographer to take construction record digital images of both sides of existing and proposed fences/walls prior to construction and periodically, monthly at a minimum, during course of the work.

1.02 RELATED REQUIREMENTS

A. Section 01010: Summary of Work.

1.03 VIDEOGRAPHY REQUIRED

A. Digital images may be used in lieu of photography.

1. Provide digital images taken on cutoff date for each scheduled application for Payment.

2. Provide digital images taken at each major stage of construction.

3. Provide digital images taken of change order work.

4. Provide five (5) prints or three (3) sets of digital media, of each view.

B. Original Digital Media:

1. Remain property of videographer.

2. Require that videographer maintain digital media for a period of two years from Date of Substantial Completion of entire Project.

3. Videographer shall agree to furnish additional digital media to CITY and the ENGINEER at commercial rates applicable at time of purchase.

1.04 COSTS OF PHOTOGRAPHY / VIDEOGRAPHY

A. CONTRACTOR shall pay costs for specified videography and digital copies.

1. Parties requiring additional videography or additional digital copies will pay videographer directly.

PART 2 - PRODUCTS

2.01 PRINTS

A. Color:

1. Media:
   a. Compact Disk:

   b. DVD

2. Resolution:

   a. 480 X 640, 24-bit color, VGA, for general site conditions, panoramas and orientation references; 600 X 800, 24-bit color, SVGA as detail requires.

3. Compatibility:

   a. If digital images are in a proprietary format, videographer shall bundle appropriate, Windows compatible, viewing software with all still and motion pictures.

B. Identify each compact disk /DVD on label, listing:

1. Name of Project and City of Lake Worth Project number to include any Bid Pack number reference.

2. Specific Location.

3. Date and time of recording.

4. Name and address of videographer.

5. Videographer's identification list of images. This list shall include file names / frame numbers (as appropriate) for the media.

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

B. Digital Images shall include aerial photograph / digital images showing the entire construction area.

3.03 DELIVERY OF PRINTS / DIGITAL MEDIA

A. Deliver of digital images to the ENGINEER to accompany each Application for Payment.

B. Distribution of DIGITAL MEDIA, as soon as processed, is anticipated to be as follows:

1. OWNER (one set).

2. ENGINEER (two sets).

3. CONTRACTOR (one set).

3.04 MEASUREMENT AND PAYMENT

A. There shall be no special measurement or payment for the work under this section; it shall be included in the lump sum price bid for item 'Mobilization'.

END OF SECTION 02220

SECTION 02221

DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the WORK under this section.

1.02 SUMMARY

A. This Section includes demolition and removal of the following:

1. Buildings and structures; and,

2. Site improvements.

B. See Section 02230, Site Clearing, for site clearing and removal of above- and below-grade improvements not part of building demolition.

1.03 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the site demolition WORK, as indicated on the Drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

1.04 RELATED WORK

A. Section 02300 - Earthwork.

B. Section 02230 - Site Clearing

C. All applicable Sections under Divisions 1, 2, 3, and 4.

1.05 QUALITY ASSURANCE

A. CONTRACTOR Qualifications: Minimum of five years experience in demolition of comparable nature.

B. Requirements of All Applicable Regulatory Agencies:

1. All applicable Building Codes and other Public Agencies having jurisdiction upon the WORK.

1.06 SUBMITTALS

A. Permits and notices authorizing building/structure demolition.

B. Certificates of severance of utility services.

C. Permit for transport and disposal of debris.

D. Demolition procedures and operational sequence for review and acceptance by ENGINEER.

1.07 JOB CONDITIONS

A. Existing Conditions:

1. The demolition WORK shall be done as indicated on the construction plans.

2. Remove all demolition debris from the site the same day the WORK is performed. Leave no deposits of demolished material on site over night unless approved by the ENGINEER.

3. Structural demolition, excavation, backfill and compaction as indicated in Drawings.

B. Protection:

1. Erect barriers, fences, guardrails, enclosures, and shoring to protect personnel, structures, and utilities remaining intact.

2. Protect designated trees and plants from damages.

3. Use all means necessary to protect existing objects and vegetation designated to remain, and, in the event of damage, immediately make all repairs, replacements and dressings to damaged plants necessary, to the approval of the ENGINEER at no additional cost to the OWNER.

C. Maintaining Traffic:

1. Ensure minimum interference with roads, streets, driveways, sidewalks, and adjacent facilities.

2. Do not close or obstruct streets and sidewalks without written approval from the ENGINEER.

3. If required by governing authorities, provide alternate routes around closed or obstructed traffic ways.

4. The CONTRACTOR shall submit with bid package an approved traffic control plan which shall also comply with Section 01570, MOT.

D. Dust Control:

1. Use all means necessary for preventing dust from demolition operations from being a nuisance to adjacent property OWNERs. Methods used for dust control are subject to approval by the ENGINEER prior to use.

E. Burning:

1. On-site burning will not be permitted.

1.08 GENERAL ITEMS

A. Scope of WORK shall comprise the following: Provide all labor, materials, necessary equipment and services to complete the demolition and clearing WORK, as indicated on the Contract plans, and as specified herein.

B. The CONTRACTOR shall provide references to the OWNER to demonstrate a minimum of five years experience in demolition of a comparable nature. Current occupational licenses held by CONTRACTOR shall be submitted to OWNER.

C. The CONTRACTOR shall be responsible for adherence to all applicable codes of all regulatory agencies having jurisdiction upon the WORKs.

1.09 REFERENCE STANDARDS

A. Code of Federal Regulations

1. 40 CRF 82

B. National Fire Protection Association

1. NFPA 241 - Standard for Safeguarding.

1.10 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.

B. Remove and Salvage: Detach items from existing construction and deliver them to the OWNER.

C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

1.11 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items or interest or value to the OWNER that may be encountered during demolition shall remain on OWNER's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to the OWNER.

1.12 SUBMITTALS (When required by OWNER or authorities having jurisdiction)

A. Qualification Data for the following:

1. Demolition Firm;

2. Test Control Firm;

3. Refrigerant Recovery Technician; and,

4. Licensed Professional Providing Demolition Oversight.

B. Pollution Control Measures

1. The CONTRACTOR shall prepare and delivery approved pollution and dust control Drawings to the OWNER with the bid package prior to the commencement of demolition WORK. The Drawing shall outline proposed methods for dust control, noise control and maintaining the surrounding streets and buildings in a clean condition for both demolition operations and during debris removal. The Drawing shall be subject to the review and approval by the OWNER and the OWNER's ENGINEER.

C. Demolition Schedule/Plan

1. The CONTRACTOR shall submit for review and approval a detailed schedule for all proposed WORK to the OWNER with the bid package. This submission shall include a calendarized schedule of the proposed WORK and a step-by-step description of all aspects pertaining to demolition and protection of existing structures and adjacent community, labor forces, demolition rubble management and disposal and other items of WORK required under this Contract.

D. Utility Schedule

1. The CONTRACTOR shall submit to the OWNER and all affected utility/service companies, a proposed schedule of coordination for all necessary utility/service shut-offs, capping and continuation of utility services as required with the bid package. The CONTRACTOR shall provide the OWNER with written confirmation for all utility or service companies serving the site that service has been terminated prior to capping, abandoning or removal of any such utility and prior to commencement of building demolition.

2. The CONTRACTOR shall, during their WORK, accurately locate and mark on the Contract Drawing the location of all underground utility and services that have been capped and those that are to remain within the Contract limit area.

E. Permits

1. Prior to submission of bid package, the CONTRACTOR shall investigate all permit requirements and include any cost for these requirements in the bid. Prior to the

commencement of WORK, the CONTRACTOR shall obtain all necessary permits and certificates associated with utility disconnections, storage tank removals and building demolition WORK from any and all Federal, State or regulatory authorities having jurisdiction over this project. The CONTRACTOR shall incur all fees and other requirements associated with obtaining the required permits and certificates. Copies of all permits executed and certificates obtained shall be sent to the OWNER. Costs associated with permit and certificate procurements, including Drawing and permit preparation, revisions, filing fees, etc., shall be borne by the CONTRACTOR.

2. Including but not limited to, the following permits and certificates may be applicable and shall be obtained by the CONTRACTOR prior to applying for and obtaining general demolition permits.

   a. Plumbing permit for water shut-off;

   b. Plumbing permit for sewer seal;

   c. Water shut-off certificate (original);

   d. Building and/or Fire Department permit for underground storage tank removal;

   e. Letters from Electric and Gas Utility companies and gas meter shut-offs;

   f. Letters from Cable TV companies for cable disconnections and removals.

   g. Certificate from Tax Office (taxes paid);

   h. Letter to adjacent Owners of proposed demolition with proof of receipt;

   i. Exterminator Certificate;

   j. Board of Health approval;

   k. Soil Erosion and Sediment Control Permit;

   l. Asbestos Abatement Permit;

   m. Asbestos Abatement Completion; and,

   n. Demolition Contractor's License.

F. Statement of Refrigerant Recovery

1. Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.13 QUALITY ASSURANCE

A. Pre-Demolition Conference

1. The CONTRACTOR along with all designated subcontractors shall schedule a pre-demolition meeting to be attended by the OWNER and other necessary attendees prior to commencement of WORK.

B. Pre-Demolition Video

1. The CONTRACTOR shall conduct and provide to the OWNER a video of site conditions prior to initiation of demolition activities. The video shall provide documentation of the condition of on-site and adjacent building structures and on-site surface features including, but not limited to curbs, sidewalks, landscapes, pavements, utility structures at grade, light poles, telephone poles, fences, bollards, etc.

C. Progress Conference

1. Once the demolition WORK has begun, the CONTRACTOR shall schedule, administer and attend meetings with the OWNER as deemed necessary by the OWNER to maintain optimum degree of communications between interested parties. The CONTRACTOR shall include selected subcontractors at such times as their interests may be involved.

1.14 PROJECT CONDITIONS

A. Buildings to be demolished will be vacated and their use discontinued before start of WORK; and,

B. The CONTRACTOR shall maintain access to existing walkways, exits, and other adjacent occupied or used facilities. The CONTRACTOR shall not close or obstruct walkways, exits, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. OWNER assumes no responsibility for buildings and structures to be demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by OWNER as far as practical.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the WORK, unless otherwise identified in the Contract Documents.

1. If materials suspected of containing hazardous materials are encountered, other than those identified in the Contract Documents, do not disturb; immediately notify OWNER.

1.15 COORDINATION

A. Arrange demolition schedule so as not to interfere with OWNER's or other existing on-site operations.

PART 2 - PRODUCTS

2.01 The CONTRACTOR shall supply all materials as required.

PART 3 - EXECUTION

3.01 CLARIFICATION

A. The Drawings do not purport to show all objects existing on the site.

B. Before commencing the WORK of this Section, verify with the OWNER all objects to be removed and all objects to be preserved. If project is adjacent to private property, notify residents and businesses two weeks in advance of items to be removed from right of way and private property.

3.02 SCHEDULING

A. Schedule all WORK in a careful manner with all necessary consideration for the public and the OWNER.

B. Avoid interference with the use of, and passage to and from, adjacent facilities.

3.03 EXAMINATION

A. Survey existing conditions and correlate with requirements indicated to determine extent of building demolition required.

B. Review project record documents of existing construction. OWNER does not guarantee that existing conditions are same as those indicated in project record documents.

C. Inventory and record the condition of items to be removed and salvaged.

D. Verify that all hazardous materials and petroleum products have been removed before proceeding with building demolitions operations.

E. Verify that all asbestos containing materials have been removed before proceeding with building demolition operations.

F. Verify that structures to be demolished are discontinued in use and ready for removal.

G. Do not commence WORK until all conditions and requirements of all applicable public agencies are complied with.

3.04 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations.

B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during demolition. When permitted by OWNER items may be removed to a suitable, protected storage location during demolition and reinstalled in their original locations after demolition operations are complete.

C. Existing Utilities: Maintain utility services indicated to remain and protect them against damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by OWNER and authorities having jurisdiction; and,

2. Provide temporary services during interruptions to existing utilities, as acceptable to OWNER and to authorities having jurisdiction.

a. Provide at least 72 hours notice to OWNER if shutdown of service is required during changeover.

D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Division 1 Section 01570 Temporary Controls.

1. Protect existing site improvements, appurtenances, and landscaping to remain;

2. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain;

3. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures; and,

4. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.

3.05 DISCONNECTION OF UTILITIES

A. Before starting site operations, disconnect or arrange for the disconnection of all effected utility service:

1. Arrange and pay for disconnecting, removing, capping, and plugging utility services and meters. Disconnect and stub off. Notify affected utility company in advance and obtain approval before starting this WORK.

2. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction.

3. Place markers to indicate location of disconnected services.

4. On-site drainage structures and drain fields shall be removed in their entirety by methods approved by the OWNER's representative, and replaced as directed by the Engineer of Record if necessary.

3.06 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. Utility Services: Maintain existing utilities, keep in service, and protect against damage during demolition operations.

B. Prevent movement or settlement of adjacent structures. Provide and place bracing or shoring and be responsible for safety and support of structures. Assume liability for such movement, settlement, damage, or injury.

C. Cease operations and notify OWNER immediately if safety of adjacent structures appears to be endangered. Take precautions to properly support structures. Do not resume operations until safety is restored.

D. Prevent movement, settlement, damage, or collapse of adjacent services, sidewalks, driveways and trees. Assume liability for such movement, settlement, or collapse. Promptly repair damage at no cost to the OWNER.

E. Ensure safe passage of persons around areas of demolition.

3.07 MAINTAINING TRAFFIC

A. Do not interfere with use of adjacent buildings and facilities. Maintain free and safe passage to and from. Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed travel ways if required by governing authorities.

3.08 POLLUTION CONTROLS

A. Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

B. Clean structures and improvements of dust, dirt, and debris caused by demolition operations as directed by the OWNER or their representative or governing authorities. Return adjacent areas to condition existing prior to start of WORK.

3.09 INSPECTION AND PREPARATION

A. Verify that structures to be demolished are discontinued in use and ready for removal.

B. Do not commence WORK until all conditions and requirements of all applicable public agencies are complied with.

C. Arrange for, and verify termination of utility services to include removing meters and capping lines.

D. The Drawings do not purport to show all objects existing on the site; at the pre-demolition or preconstruction meeting before commencement of the WORK, verify with the OWNER all objects to be removed and all objects to be preserved.

3.10 DEMOLITION

A. General: Demolish as indicated on Drawings as specifically identified on construction Drawings existing buildings, structures, and site improvements completely.

B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from OWNER and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction; and,

2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

C. Pull out any existing utility lines designated for abandonment, irrigation, electrical lines, pull boxes and splice boxes, maintenance access structures and catch basins to be removed and all other objects designated to be removed or interfering with the WORK in advance of mobilization. Contact the utility company or agency involved for their requirements for performing this WORK in advance of construction. All removed equipment and materials shall be removed from the WORK area the same day as removed.

D. Remove all debris from the site and leave the site in a neat, orderly condition to the full acceptance of the ENGINEER, or the OWNER. No debris shall be left on the site over night.

E. Clear and Grub and dispose of all trees, shrubs and other organic matter not otherwise addressed on tree removal and relocation plans and specifications. There shall be no special measurement and payment for this WORK. It shall be included in Clearing.

3.11 MECHANICAL DEMOLITION

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on next lower level.

B. Remove debris from elevated portions by chute, hoist, or other device that will convey debris to grade level in a controlled descent. Remove structural framing members and lower to ground by method suitable to minimize ground impact or dust generation.

C. Below-Grade Construction: Demolish foundation walls and other below-grade construction that is within 10 feet outside of building limits indicated for new construction to a minimum depth of 2 feet below subgrade or as indicated on Drawings or as required to eliminate conflict with new construction. Below-grade construction outside this area shall be abandoned or removed as indicated on the Drawings.

D. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within 10 feet outside of building limits indicated for new construction. Abandon utilities outside this area. Remove, abandon, or grout fill existing utilities and/or utility structures as identified on the Drawings or as directed by the OWNER.

3.12 EXPLOSIVE DEMOLITION

A. Explosives: Use of explosives must be approved by the OWNER and appropriate authorities having jurisdiction.

3.13 SITE RESTORATION

A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.

B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Division 2 Section 02300, Earthwork.

C. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.14 REPAIRS

A. General: Promptly repair damage to adjacent construction caused by building demolition operations.

B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.15 DISPOSAL OF DEMOLISHED MATERIALS

A. General

1. The CONTRACTOR shall remove from the site all debris, rubbish and other

materials resulting from demolition and shall safely and legally dispose of all these items in accordance with applicable Federal, State and regulatory authority having jurisdiction codes and regulations. All recycling must be done in accordance with all currently applicable State waste flow regulations, and regulatory authority having jurisdiction requirements. Burning of any demolished materials on-site shall not be permitted. Any recycling of demolition debris shall be approved by the OWNER.

2. Material resulting from demolition and not scheduled for salvaging shall become the property of the CONTRACTOR and shall be removed from site and legally disposed of off-site. Disposal shall be timely, performed as promptly as possible and not left until the final cleanup. Material shall not be left on the job site for more than 60 days.

3. Remove from site contaminated, vermin infested, or dangerous materials encountered and disposed of by safe means so as not to endanger health of workers and public.

4. Burning of removed materials from demolished structures will not be permitted on-site.

B. Submittals

1. Written permission shall be obtained from the property OWNER on whose property the demolition material is to be disposed. Copies of the agreements shall be furnished to the OWNER prior to removing any materials from the demolition site; and,

2. Hazardous Materials: The CONTRACTOR shall provide manifests or disposal tickets for each truck that exits and enters the site with demolition and construction material to the OWNER's ENGINEER and the OWNER. These manifests shall indicate the following:

   a. Date and time of departure from the demolition site;

   b. Type of material carted off-site or type of material brought on-site;

   c. Amount of material brought on-site;

   d. Amount of material (in tons);

   e. Truck ID number;

   f. Final destination of the excess material;

   g. Date and time of entry to the demolition material;

   h. Date and time of entry to the demolition site;

   i. Amount of material; and,

j. Source of material brought on-site.

3.16 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

3.17 COMPLETION OF WORK

A. Leave the site in a neat, orderly condition to the full acceptance of the OWNER.

B. Dirt remaining after demolition shall be graded level and compacted, in preparation for filling operations to follow demolition. Trenches shall be filled in layers of 12" maximum thickness and compacted in accordance with the technical specifications applicable to backfilling of trenches.

3.18 MEASUREMENT AND PAYMENT

A. There shall be no special measurement or payment for the WORK under this section, it shall be included in the price bid for items associated with the removal and disposal/demolition.

END OF SECTION 02221

SECTION 02230

SITE CLEARING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the clearing work, as indicated on the drawings, as specified herein or both.

B. Under this section, the CONTRACTOR shall do all clearing, grubbing, root-raking, and necessary clean-up operations in connection with the construction of the work and its related sitework.

C. The work shall consist of the removal and disposal of trees, stumps, roots, limbs, brush, fences (chain link, wood, etc.), decorative or masonry walls, etc. from all project areas as designated on the drawings as specified herein, and as directed by the ENGINEER on the site. Fencing and walls removed shall be neatly placed on adjacent property if requested by CITY or property owner. Trees or shrubs shall be placed on adjacent property if requested by CITY or property owner. Otherwise, the CONTRACTOR shall dispose of them offsite at the CONTRACTOR's expense.

D. The CONTRACTOR shall remove all refuse, asphalt pavement, concrete pavement, glass, metal, stone, plaster, lumber, paper materials, and any and all trash found in clearing and adjacent areas as directed by the ENGINEER.

E. The CONTRACTOR shall furnish all services, labor, transportation, materials, and equipment necessary for the performance of these operations. All clearing and cleanup operations shall be accomplished to the complete satisfaction of the ENGINEER.

F. The CONTRACTOR shall strip all existing topsoil and stockpile it on-site in locations approved by the OWNER. All topsoil material shall be stockpiled within a haul distance of 3,000 feet.

1.03 RELATED WORK

A. Section 02210 - Subsurface Investigation

B. Section 02300 - Earthwork

C. Section 02370 - Erosion Control and Slope Protection

1.04 MATERIALS OWNERSHIP

A. Except for materials indicated to be stockpiled or to remain on owner's property, cleared materials shall become the CONTRACTOR's property and shall be removed from the site.

1.05 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on OWNER's premises where indicated.

C. Notify utility locator service for area where Project is located prior to site clearing as per requirements.

D. CONTRACTOR shall verify existing grades prior to performing work under this section. If existing grades are at variance with the drawings, notify the OWNER and receive instructions prior to proceeding. No additional compensation will be considered resulting from grade variances once site clearing has commenced.

E. All benchmarks and monuments shall be protected during construction. If disturbed or destroyed, they shall be replaced in original position by a licensed surveyor at the CONTRACTOR's expense.

F. Protect areas outside limits of disturbance from encroachment by construction personnel or equipment, regardless of property ownership. Access shall be by specific, written permission or easement only.

PART 2 - PRODUCTS

2.01 CONTRACTOR shall provide and use all necessary equipment and materials to perform work satisfactorily.

PART 3 - EXECUTION

3.01 PREPARATION

A. Locate and clearly flag trees and vegetation to remain or to be relocated. All trees and vegetation to remain shall be barricaded and protected during the construction process per Article 3.02 of this section.

B. Limit of clearing is to be staked in accordance with CONTRACTOR's calculated ROW limits, and verified by OWNER prior to removal of any trees or other improvements.

C. All trees and shrubs not designated to remain within the area to be graded, whether shown or not on the drawings, shall be cut and the removal of stumps shall comply with

Article 3.03 of this section. Burning on site is not permitted, unless otherwise approved by the OWNER and authorities having jurisdiction.

D. Protect existing site improvements to remain, from damage during construction. Restore damaged improvements to their original condition, as acceptable to the OWNER.

3.02 TREE PROTECTION

A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.

B. Do not excavate within drip line of trees, unless otherwise indicated.

C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the OWNER.

3.03 TREE REMOVAL AND TREE PRESERVATION

A. No trees shall be removed if located outside of the right-of-way.

B. Within the rights-of-way, no trees with a trunk diameter of 3" or greater than 4-1/2' above grade shall be removed without the approval of the ENGINEER with the exception of Australian Pines, Melaleuca or Florida Holly. Trees shall be evaluated on an individual basis in accordance with following:

1. Type and size of tree.

2. Proximity to proposed and/or existing utility lines and/or exfiltration trench.

3. Change in adjacent grades for swale excavation.

4. Proximity to proposed sidewalk.

5. Proximity to proposed edge of roadway.

6. Living condition of the tree.

C. At the request of the adjacent home owner, some trees including Palm Trees and other trees may be relocated to private property by the CONTRACTOR. Homeowners shall be responsible for preparation of an area to place the tree and for subsequent watering of the relocated trees.

D. If requested by the OWNER or municipality, trees to be removed may be relocated by CONTRACTOR to a location within 5 miles of the project limits.

3.04 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation within the limit of disturbance to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots, unless otherwise specified. In areas outside the building limits where the depth of fill exceeds 8 feet in height, unless otherwise directed by the OWNER, sound trees shall be cut at a height of not more than 6 inches above natural ground.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers and compact each layer to a density equal to adjacent original ground as in accordance with Section 02300, Earthwork.

3.05 TOPSOIL STRIPPING

A. Strip topsoil to full depth encountered in areas indicated to be graded in a manner to prevent intermingling with underlying subsoil or waste materials.

B. Stockpile sufficient topsoil material to facilitate sodding and landscaping. Stockpile away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water.

C. Protect soil stockpiles as per Section 02370, Erosion Control and Slope Protection.

3.06 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable or excess topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off OWNER's property.

3.07 MEASUREMENT AND PAYMENT

A. There shall be no separate measurement and payment for the work under this section. It shall be included in the appropriate unit price bid.

END OF SECTION 02230

SECTION 02240

DEWATERING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 WORK INCLUDED

A. Obtain any permits required and provide all labor, materials, necessary equipment and services to complete any dewatering required for the satisfactory completion of the WORK.

1.03 RELATED WORK

A. Section 02300 - Earthwork.

B. Section 02305 - Excavation and Backfilling for Utilities.

C. Section 02502 - Valves, General.

D. Section 02510 - Water Distribution System.

E. Section 02530 – Sanitary Sewerage System.

F. Section 02535 – Structures and Maintenance Access Structures.

PART 2 - PRODUCTS

2.01 EQUIPMENT

A. Dewatering, where required, may include the use of temporary reservoirs and diking, well points, sump pumps, temporary pipelines for water disposal; discharge testing for petroleum products, metals, pH, turbidity, etc.; rock or gravel placement; and other means. Standby pumping equipment must be maintained on the jobsite and operate within any local noise ordinance limits. “Silent Knight” pump equipment is preferred. All safety requirements, fencing, etc. shall be installed and maintained by the CONTRACTOR.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. The CONTRACTOR shall provide all equipment necessary for dewatering. It shall have on hand, at all times, sufficient pumping equipment and machinery in good working condition and shall have available, at all times, competent workmen for the operation of the pumping equipment. Adequate standby equipment shall be kept available at all times to insure efficient dewatering and maintenance of dewatering operation during power failure.

B. Dewatering for structures and pipelines shall commence when groundwater is first encountered, and shall be continuous until such times as water can be allowed to rise in accordance with the provisions of this Section or other requirements.

C. At all times, site grading shall promote drainage. Surface runoff shall be diverted from excavations. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and be pumped or drained by gravity from the excavation to maintain a bottom free from standing water.

D. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.

E. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with pea rock at no additional cost to the COUNTY.

F. The CONTRACTOR shall maintain the water level below the bottom of excavation in all work areas where groundwater occurs during excavation construction, and backfilling, up to natural groundwater level.

G. Flotation shall be prevented by the CONTRACTOR by maintaining a positive and continuous removal of water. The CONTRACTOR shall be fully responsible and liable for all damages which may result from failure to adequately keep excavations dewatered.

H. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sand-packed and/or other means used to prevent pumping of fine sands or silts from the subsurface. A continual check by the CONTRACTOR shall be maintained to ensure that the subsurface soil is not being removed by the dewatering operation.

I. The CONTRACTOR shall dispose of water from the WORK in a suitable manner without damage to adjacent property. CONTRACTOR shall be responsible for obtaining any permits that may be necessary to dispose of water including water sampling and testing per all regulatory requirements. No water shall be drained into work built or under construction without prior consent of the ENGINEER. Water shall be filtered using a silt box or another approved method to remove sand and fine-sized soil particles before disposal into any drainage system. Dewatering disposal points shall be approved by the ENGINEER prior to being used. Storm drains used by the CONTRACTOR for dewatering shall be cleaned by a jet vac or other method approved by the ENGINEER after dewatering is complete.

J. The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures, pipelines, and sewers.

K. Dewatering of trenches, testing, and other excavations shall be considered as incidental to the construction of the WORK and all costs thereof shall be included in the various contract prices in the Bid Forms, unless a separate bid item has been established for dewatering. If the CONTRACTOR chooses to construct a dewatering pit a copy of the land lease shall be submitted to the COUNTY. Perimeter berms and chain link fence shall be constructed as necessary for safety.

L. The CONTRACTOR shall submit a dewatering plan to the CONSULTANT for review. The CONTRACTOR is advised that the South Florida Water Management District (SFWMD) will require that a dewatering plan, prepared by a State of Florida licensed Professional Engineer or Registered Professional Geologist, be submitted and approved prior to issuance of a dewatering permit. The CONTRACTOR will retain a State of Florida Licensed Professional Engineer or Registered Professional Geologist to prepare and submit dewatering report application to the regulatory agencies for permitting.

M. The CONTRACTOR may be required to provide testing and monitoring of the dewatering operations, and to institute dewatering methods and controls, as required by SFWMD. The CONTRACTOR will be responsible for all costs associated with means and methods of dewatering which will be set forth by dewatering permits.

3.02 QUALITY CONTROL

A. It shall be the sole responsibility of the CONTRACTOR to control the rate and effect of the dewatering in such a manner as to avoid all objectionable settlement and subsidence.

B. All dewatering operations shall be adequate to assure the integrity of the finished project and shall be the responsibility of the CONTRACTOR.

C. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, reference points shall be established and observed at frequent intervals to detect any settlement which may develop. The responsibility for conducting the dewatering operation in a manner which will protect adjacent structures and facilities rests solely with the CONTRACTOR. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the CONTRACTOR.

3.03 CONTRACTOR SUBMITTALS

A. Prior to commencement of excavation, the CONTRACTOR shall submit a detailed plan and operation schedule for dewatering of excavations. The CONTRACTOR may be required to demonstrate the system proposed and to verify that adequate equipment, personnel, and materials are provided to dewater the excavations at all locations and times. The CONTRACTOR's dewatering plan is subject to review by the ENGINEER

and regulatory agencies.

3.04 MEASUREMENT AND PAYMENT

A. There shall be no special measurement or payment for the work under this section, it shall be included in the appropriate unit price bid.

END OF SECTION 02240

SECTION 02300

EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the Earthwork, as required to install the pipe as indicated on the drawings, as specified herein or both.

B. Including but not necessarily limited to the following:

1. Excavation, including demucking.

2. Backfilling.

3. Filling.

4. Grading, general site and building pads.

5. Compaction.

6. Coordination with ENGINEER for offsite disposal of all excess materials and stock piling of suitable materials to be used as fill or backfill.

C. Cutting, proofrolling, filling and grading to required lines, dimensions, contours and elevations for proposed improvements as shown and implied on the drawings and required by these specifications.

D. Scarifying, compaction, moisture content conditioning and control, and removal of unsuitable material to ensure proper preparation of areas for the proposed improvements.

E. Undertake any special construction procedures for the site recommended in the geotechnical report for preparation of building and pavement areas.

F. There shall be no classification of excavation for measurement of payment regardless of materials encountered.

G. The work of this Section includes all earthwork required for construction of the WORK. Such earthwork shall include, but not be limited to, the loosening, removing, loading, transporting, depositing, and compacting in its final location of all materials wet and dry, as required for the purposes of completing the work specified in the Contract Documents,

which shall include, but not be limited to, the furnishing, placing, and removing of sheeting and bracing necessary to safely support the sides of all excavation; all pumping, ditching, draining, and other required measures for the removal or exclusion of water from the excavation; the supporting of structures above and below the ground; all backfilling around structures and all backfilling of trenches and pits; the disposal of excess excavated materials; borrow of materials to makeup deficiencies for fills; and all other incidental earthwork, all in accordance with the requirement of the Contract Documents.

1.03 RELATED WORK

A. All applicable sections of Division 1, 2, and 3.

1.04 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. **Codes:** All codes, as referenced herein, are specified in Section 01420, "Reference Standards".

B. **American Society for Testing and Materials (ASTM) - latest edition**

ASTM D 422	Method for Particle-Size Analysis of Soils.
ASTM D 698	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb (2.49-kg) Rammer and 12-in (304.8-mm) Drop.
ASTM D 1556	Test Method for Density of Soil in Place by the Sand Cone Method.
ASTM D 1557	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in (457-mm) Drop.
ASTM D 1633	Test Method for Compressive Strength of Molded Soil-Cement Cylinders.
ASTM D 2216	Laboratory Determination of Moisture content of Soil.
ASTM D 2419	Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
ASTM D 2487	Classification of Soils for Engineering Purposes.
ASTM D 2901	Test Method for Cement Content of Freshly-Mixed Soil-Cement.
ASTM D 2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
ASTM D 3017	Test for Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

ASTM D 4253 Test Methods for Maximum Index Density of Soils Using a Vibratory Table.

ASTM D 4254 Test Methods for Minimum Index Density of Soils and Calculation of Relative Density.

ASTM D 4318 Test for Plastic Limit, Liquid Limit, and Plasticity Index of Soils

ASTM D 4429 Standard Test Method for CBR (California Bearing Ratio) of Soils in Place

C. American Association of State Highway and Transportation Officials (AASHTO) - latest edition

1. T 88 Particle Size Analysis of Soils

1.05 SUBSOIL INFORMATION

A. Refer to Section 02210 - Subsurface Investigation.

1.06 SITE INSPECTION

A. The CONTRACTOR shall visit the site and acquaint themselves with all existing conditions. Make their own subsurface investigation to satisfy themselves as to site and subsurface conditions, but such subsurface investigations shall be performed only under time schedules and arrangements approved in advance by the OWNER and ENGINEER.

1.07 TOPOGRAPHIC INFORMATION

A. The existing grades shown on the drawings are approximate only and no representation is made as to their accuracy or consistency. The CONTRACTOR shall verify all existing grades to the extent necessary to insure completion of the job to the proposed grades indicated on the drawings.

1.08 DISPOSAL OF SURPLUS OR UNSUITABLE MATERIAL

A. Unsuitable material encountered during the course of construction shall be removed from the construction site at the expense of the CONTRACTOR. Unsuitable material shall not be stockpiled on-site. All suitable material shall be stockpiled at areas approved by the ENGINEER.

1.09 BENCHMARKS AND MONUMENTS

A. CONTRACTOR shall employ a registered Professional Surveyor and Mapper to lay out lines and grades as indicated. Benchmarks shall be established by a Professional Surveyor and Mapper registered in the State of Florida. Benchmarks shall be permanent and easily accessible and maintained and replaced if disturbed or destroyed. All benchmarks shall be North American Vertical Datum of 1988 (NAVD).

1.10 UTILITIES

A. Before starting site operations, arrange for the disconnection of all utility services designated to be removed, or are required to be disconnected for the satisfactory completion of the WORK.

B. Locate all existing active utility lines traversing the site and determine the requirements for their protection. Preserve in operating condition all active utilities adjacent to or traversing the site and/or designated to remain.

C. Observe rules and regulations governing respective utilities in working under requirements of this section. Adequately protect utilities from damage, remove or replace as indicated, specified or required. Remove, plug or cap inactive or abandoned utilities encountered in excavation. Record location of all utilities.

1.11 QUALITY ASSURANCE

A. A geotechnical engineer may be retained by the OWNER to observe performance of work in connection with excavating, filling, grading, and compaction. This inspection will not relieve the CONTRACTOR from their responsibility to complete the work in accordance with the drawings and specifications. The CONTRACTOR shall re-adjust all work performed that does not meet technical or design requirements but make no deviations from the Contract documents without specific and written acceptance of the ENGINEER.

B. Visual field confirmation and density testing of subgrade preparation and fill placement procedures shall be performed by the field geotechnical engineer as part of the construction testing requirements. The CONTRACTOR shall be informed as soon as possible of the test results.

C. The ENGINEER shall prepare field reports that indicate compaction test location, elevation data, testing results and acceptability. The OWNER and CONTRACTOR shall be provided with written copies of the results within 24 hours of time test was performed.

D. All costs related to reinspection, due to failures, shall be paid for by the CONTRACTOR at no additional expense to OWNER. The OWNER reserves the right to direct any inspection that is deemed necessary. CONTRACTOR shall provide free access to site for inspection activities.

E. Where soil material is required to be compacted to a percentage of maximum density, the maximum density at optimum moisture content will be determined in accordance with ASTM D 1557. Where cohesionless, free draining soil material is required to be compacted to a percentage of relative density, the calculation of relative density will be determined in accordance with ASTM D 4253 and D 4254. Field density in-place tests will be performed in accordance with ASTM D 1556, ASTM D 2922, or by such other means acceptable to the ENGINEER.

F. In case the tests of the fill or backfill show non-compliance with the required density, the CONTRACTOR shall accomplish such remedy as may be required to insure compliance. Subsequent testing to show compliance shall be by a testing laboratory selected by the OWNER and shall be at the CONTRACTOR's expense.

G. Particle size analysis of soils and aggregates will be performed using ASTM D 422.

H. Determination of sand equivalent value will be performed using ASTM D 2419.

I. **Unified Soil Classification System:** References in these specifications are to soil classification types and standards set forth in ASTM D 2487. The CONTRACTOR shall be bound by all applicable provisions of said ASTM D 2487 in the interpretation of soil classifications.

J. Comply with requirements of all applicable building codes and other public agencies having jurisdiction upon the work.

1.12 SUBMITTALS

A. Within 10 days after award of the contract, the CONTRACTOR shall submit to the OWNER, with their bid package, a schedule detailing the sequence, and time of completion of all phases of work under this section.

B. At least 2 weeks in advance of imported fill use, the CONTRACTOR shall submit the following laboratory test data to the ENGINEER for each type of imported soil/gravel material to be used as compacted fill.

1. Moisture and Density Relationship: ASTM D1557 or D698 as required by project geotechnical engineering study;

2. Mechanical Analysis: AASHTO T-88; and,

3. Plasticity Index: ASTM D 4318.

C. Together with the above test data, the CONTRACTOR shall submit a 5 pound sample of each type of off-site fill material in an air tight container for the approval of the ENGINEER and OWNER.

D. Submit the name of each material supplier and specific type and source of each material. Any change in source or soil type throughout the job requires approval of the OWNER and the ENGINEER.

PART 2 - PRODUCTS

2.01 SUITABLE FILL AND BACKFILL MATERIAL REQUIREMENTS

A. **General:** Fill, backfill, and embankment materials shall be suitable selected or processed clean, fine earth, rock, or sand, free from grass, roots, brush, or other vegetation.

B. Fill and backfill materials to be placed within 6 inches of any structure or pipe shall be free of rocks or unbroken masses of earth materials having a maximum dimension larger than 3 inches.

C. **Suitable Materials:** Soils not classified as unsuitable as defined in Paragraph entitled, "Unsuitable Material" herein, are defined as suitable materials and may be used in fills, backfilling, and embankment construction subject to the specified limitations. In addition, when acceptable to the ENGINEER, some of the material listed as unsuitable may be used when thoroughly mixed with suitable material to form a stable composite.

D. Suitable materials may be obtained from on-site excavations, may be processed on-site materials, or may be imported. If imported materials are required to meet the requirements of this Section or to meet the quantity requirements of the project the CONTRACTOR shall provide the imported materials at no additional expense to the OWNER, unless a unit price item is included for imported materials in the bidding schedule.

E. On-site fill

1. On-site materials for use as fill shall consist of excavated soil from other portions of the site;

2. The CONTRACTOR shall use the on-site soil judiciously to facilitate the construction schedule including the use of the most readily compactable soil for fill in building areas and as fill within 2 feet of pavement subgrade;

3. Topsoil shall not be utilized as engineered fill;

4. Excavated material containing rock, stone or masonry debris smaller than 2 feet in its largest dimension, may be mixed with suitable material and utilized up to 3 feet below proposed subgrade;

5. Excavated material containing rock, stone or masonry debris smaller than 6 inches in its largest dimension may be mixed with suitable material and utilized up to 18 inches below proposed subgrade;

6. No material greater than 2 inches in its largest dimension may be utilized within 18 inches of proposed subgrade;

7. No material greater than 2 inches in its largest dimension may be utilized as backfill for storm drainage or utility trenches.

8. Prior to placement, on-site material to be used as fill shall not contain:

   a. Debris other than crushed concrete and brick meeting the above requirements.

b. Timber or railroad ties.

c. Other deleterious materials such as steel rails, rebar, trash, etc.

d. Hazardous material - Unsuitable and deleterious materials and debris shall be disposed of off-site in accordance with all applicable regulations.

F. Off-site imported fill

1. If necessary, off-site fill shall be obtained and provided by the CONTRACTOR;

2. Fill shall be clean, well graded granular soil which is non-expansive and non-collapsible and shall have less than 20% by weight passing the #200 sieve. The portion passing the #200 shall be non-plastic. Fill with less fines (less than #200) may be required on project specific basis and as required by ENGINEER. Likewise, fill with more than 20% fines may be acceptable on a project specific basis or as identified in a geotechnical engineering study;

3. Imported fill shall be free of all hazardous substances. Certification of compliance and, if requested, test results substantiating compliance shall be furnished to the OWNER and ENGINEER by the CONTRACTOR not less than one week prior to its intended use;

4. The OWNER reserves the right to test off-site fill material for conformance with these specifications; and,

5. The CONTRACTOR shall be responsible for all permits and regulatory requirements associated with offsite borrow sources.

G. The following types of suitable materials are designated and defined as follows:

1. Type 1 (one inch minus granular backfill): Crushed rock, gravel, or sand with 100 percent passing a 1-inch sieve and a sand equivalent value not less than 50.

2. Type 2 (one half inch minus granular backfill): Crushed rock, gravel, or sand with 100 percent passing a 1/2-inch sieve and a sand equivalent value not less than 50.

3. Type 3 (sand backfill): Sand with 100 percent passing a 3/8-inch sieve, at least 90 percent passing a number 4 sieve, and a sand equivalent value not less than 30.

4. Type 4 (coarse rock backfill): Crushed rock or gravel with 100 percent passing a 1-inch sieve and not more than 10 percent passing a Number 4 sieve.

5. Type 5 (pea gravel backfill - ASTM #89): Crushed rock or gravel with 100 percent passing a 1/2-inch sieve, 90 percent passing a Number 8 sieve and not more than 10 percent passing a Number 4 sieve.

6. Type 6 (coarse drainrock - ASTM #4): Crushed rock or gravel meeting the following gradation requirements:

Sieve Size	Percentage Passing
2-inch	100
1-1/2-inch	90-100
1-inch	20-55
3/4-inch	0-15
No. 200	0-3

7. Type 7 (graded drainrock): Crushed rock or gravel, durable and free from slaking or decomposition under the action of alternate wetting or drying. The material shall be uniformly graded and shall meet the following gradation requirements.

Sieve Size	Percentage Passing
1-inch	100
3/4-inch	90-100
3/8-inch	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

The drainrock shall have a sand equivalent value not less than 75. The finish graded surface of the drainrock immediately beneath hydraulic structures shall be stabilized to provide a firm, smooth surface upon which to construct reinforced concrete floor slabs.

8. Type 8 (Ballast Rock / ¾" Rock): Crushed rock or gravel, durable and free from slaking or decomposition under the action of alternate wetting or drying. The material shall be uniformly graded and shall meet the following gradation requirements.

Sieve Size	Percentage Passing
1-inch	100
3/4-inch	40-60
No. 4	0-3
No. 8	0-3

9. Type 9: (Bedding rock -ASTM #67): Well graded crushed rock or gravel meeting the following gradation:

Sieve Size	Percentage Passing
1-inch	100
3/4-inch	98-100
1/2-inch	55-70
3/8-inch	30-40
No. 4	0-6

10. Type 10 (Class I crushed stone - ASTM #57): Manufactured angular, granular crushed stone, rock, or slag, with 100 percent passing a 1-inch sieve and less than 5 percent passing a Number 4 sieve.

11. Type 11 (aggregate base): Crushed rock aggregate base material of such nature that it can be compacted readily by watering and rolling to form a firm, stable base for pavements. At the option of the CONTRACTOR, the grading for either the 1-1/2-inch maximum size or 3/4-inch maximum size shall be used. The sand equivalent value shall be not less than 22, and the material shall meet the following gradation requirements.

	Percentage Passing	
Sieve Size	1-1/2 inch Max.	3/4-inch Max.
2-inch	100	-
1-1/2 inch	90-100	-
1-inch	-	100
3/4-inch	50-85	90-100
No. 4	25-45	35-55
No. 30	10-25	10-30
No. 200	2-9	2-9

12. Type 12 (aggregate subbase): Crushed rock aggregate subbase material that can be compacted readily by watering and rolling to form a firm stable base. The sand equivalent value shall be not less than 18 and shall meet the following gradation requirements.

Sieve Size	Percentage Passing
3-inch	100
2-1/2 inch	87-100
No. 4	35-95
No. 200	0-29

13. Type 13 (cement-treated backfill): Material which consists of Type 7 material, or any mixture of Types 3, 7, 10 and 11 materials which has been cement-treated so that the cement content of the material is not less than 5 percent by weight when

tested in accordance with ASTM D 2901. The ultimate compressive strength at 28 days shall be not less than 400 psi when tested in accordance with ASTM D 1633.

14. Type 14 (topsoil): Stockpiled topsoil material which has been obtained at the site by removing soil to a depth not exceeding 2 feet. Removal of the topsoil shall be done after the area has been stripped of vegetation and debris as specified.

15. Type 15 (trench plug): Low permeable fill material, a nondispersible clay material having a minimum plasticity index of 10.

H. If approved by the ENGINEER, any bituminous concrete on the site shall be milled/removed prior to placing any fill and shall be reused only onsite immediately below the pavement stone base course.

2.02 UNSUITABLE MATERIAL

A. Unsuitable soils for fill material shall include soils which, when classified under ASTM D 2487, fall in the classifications of Pt, OH, CH, MH or OL.

B. In addition, any soil which cannot be compacted sufficiently to achieve the percentage of maximum density specified for the intended use shall be classed as unsuitable material.

2.03 USE OF FILL, BACKFILL, AND EMBANKMENT MATERIAL TYPES

A. The CONTRACTOR shall use the types of materials as designated herein for all required fill, backfill, and embankment construction hereunder.

B. Where these Specifications conflict with the requirements of any local agency having jurisdiction, or with the requirements of a material manufacturer, the ENGINEER shall be immediately notified. In case of conflict therewith, the CONTRACTOR shall use the most stringent requirement, as determined by the ENGINEER.

C. Fill and backfill types shall be used in accordance with the following provisions:

1. Embankment fills shall be constructed of any mixture of Type 1 through Type 11 materials.

2. Pipe zone backfill, as defined under Paragraph 3.15 "Pipe and Utility Trench Backfill" herein, shall consist of the following materials for each pipe material listed below. Where pipelines are installed on grades exceeding 4 percent, and where backfill materials are graded such that there is less than 10 percent passing a Number 4 sieve, trench plugs of Type 13 or 14 materials shall be provided at maximum intervals of 200 feet or as shown on the Drawings.

a. Mortar coated pipe, concrete pipe, and uncoated ductile iron pipe shall be provided Type 1, 2, 3, 4, 5, 9 or 10 pipe zone backfill materials.

b. Coal tar enamel coated pipe, polyethylene encased pipe, tape wrapped pipe, and other non-mortar coated pipe shall be backfilled with Type 3 pipe zone backfill material.

c. Plastic pipe and vitrified clay pipe shall be backfilled with Type 9 or 10 pipe zone backfill material.

3. Trench zone backfill for pipelines as defined under Paragraph 3.15 "Pipe and Utility Trench Backfill" shall be or any of Types 1 through 11 backfill materials or any mixture thereof, except that Type 14 material may be used for trench zone backfill in agricultural areas unless otherwise shown or specified.

4. Final backfill material for pipelines under paved area, as defined under Paragraph 3.15 "Pipe and Utility Trench Backfill" shall be Type 11 backfill material. Final backfill under areas not paved shall be the same material as that used for trench backfill, except that Type 14 material shall be used for final backfill in agricultural areas unless otherwise shown or specified.

5. Trench backfill and final backfill for pipelines under structures shall be the same material as used in the pipe zone, except where concrete encasement is required by the Contract Documents.

6. Aggregate base materials under pavements shall be Type 11 material constructed to the thicknesses shown or specified. Where specified or shown, aggregate subbase shall be Type 12 Material.

7. Backfill around structures shall be or Types 1 through Type 11 materials, or any mixture thereof.

8. Backfill materials beneath structures shall be as follows:

a. Drainrock materials under hydraulic structures or other water retaining structure with underdrain systems shall be Type 7 or Type 8 material.

b. Under concrete hydraulic structures or other water retaining structures without underdrain systems, Types 7, 8 or 11 materials shall be used.

c. Under structures where groundwater must be removed to allow placement of concrete, Type 6 material shall be used.

d. Under all other structures, Type 4, 5, 6, 7, 8, 9 or 11 material shall be used.

9. Backfill used to replace pipeline trench over-excavation shall be a layer of Type 6, 7, 8, 9 or 10 materials. This backfill material shall be wrapped with filter fabric to prevent migration of fines for wet trench conditions. The same material as

used for the pipe zone backfill may be used if the trench conditions are not wet. Filter fabric shall be **Mirafi 140 N, Mirafi 700 X, or equal.**

10. The top 6 inches of fill on reservoir roofs, embankment fills around hydraulic structures, and all other embankment fills shall consist of Type 14 material, topsoil.

2.04 EMBANKMENT

A. The maximum sizes of rock which will be permitted in the completed fill areas are as follows:

Depth Below Finish Grade	Maximum Allowable Diameter
Top 4 inches	1 inch
4 inches to 12 inches	3-1/2 inches
12 inches to 2 feet	6 inches
2 feet to 4 feet	12 inches
4 feet to 8 feet	24 inches
Below 8 feet	36 inches

B. Embankments shall be constructed of material containing no muck, stumps, roots, brush, vegetable matter, rubbish or other material that will not compact into a suitable and enduring roadbed, and material designated as undesirable shall be removed from the site. Where embankments are constructed adjacent to bridge end bents or abutments, rock larger than 3-1/2 inches in diameter shall not be placed within three feet of the location of any abutment.

C. Fill material containing debris, sod, biodegradable materials shall not be used as fill in construction areas.

D. Fill material required for the building pads and for pavement subgrade shall be granular fill, free of organic material.

E. Fill material required for pervious and sodded areas shall have a maximum organic component of 10%. CONTRACTOR shall provide, at their cost, organic content test results for approval by the ENGINEER.

2.05 EQUIPMENT

A. Compactor for mass earthwork shall be minimum 3 ton static drum weight vibratory roller or 5 ton static drum weight sheeps footed compactor as appropriate for the type of soil material at the site or other compactor approved by the ENGINEER.

B. Compactor for trenches and where access or maneuverability is limited use, a double drum walk behind roller or vibratory plate compactor or "jumping jack" tampers.

PART 3 - EXECUTION

3.01 GENERAL

A. Prior to bidding of all work within this section, the CONTRACTOR shall become thoroughly familiar with the geotechnical engineering study, if available, as well as the site, site conditions, and all portions of the Work falling within this section.

B. The CONTRACTOR shall refer to the erosion control drawings, if provided, for staging of earthwork operations and for erosion control measures to be implemented prior to commencement of earthwork.

C. Locate and identify existing utilities that are to remain and protect them from damage.

D. Notify utility companies to allow removal and/or relocation of any utilities that are in conflict with the proposed improvements.

E. Protect fences, structures, sidewalks, paving, curbs, etc. that are to remain from equipment and vehicular traffic.

F. Protect benchmarks, property corners and all other survey monuments from damage or displacement. If a marker needs to be removed/relocated it shall be referenced by a licensed land surveyor and replaced, as necessary, by the same at no additional cost to the OWNER.

G. Remove from the site, material encountered in grading operations that, in opinion of OWNER or ENGINEER, is unsuitable or undesirable for backfilling in pavement or building areas as per Paragraph 2.01.

H. Identify required lines, levels, contours and datum to bring site grades to the proposed subgrade conditions inferred from the drawings.

I. Do not perform any work associated with this section prior to completion of all required inspections, tests and approvals.

J. When performing grading operations during periods of prolonged wet or dry weather, provide adequate measures for surface drainage and ground water control, and moisture control of soils (i.e., wetting or drying, scarify and discing) so as to place and compact the soil within the moisture content range a few percentage points of its optimum water content. Any disturbed areas should be proofrolled at the end of each day.

K. Sloping, shoring, bracing, and fencing shall be installed in accordance with Federal OSHA requirements as well as the requirements of all regulatory authorities having jurisdiction.

L. Allow no debris to accumulate on-site. Haul debris away from the site and dispose of at no cost to the OWNER.

M. The CONTRACTOR shall remove and dispose of all excess excavated material at a site selected by the CONTRACTOR and reviewed by the ENGINEER.

3.02 JOB CONDITIONS

A. Protection: Use all means necessary to protect existing objects and vegetation. In the event of damage, immediately make all repairs, and replacements necessary to the acceptance of the ENGINEER at no cost to the OWNER.

3.03 BACKFILL, FILLING & GRADING

A. Grades:

1. Cut, backfill, fill and grade to proper grade levels indicated. The proposed grades shown on the drawings are for establishing a finished grade over the site.

B. Filling:

1. Fill material shall be placed in horizontal layers and spread to obtain a uniform thickness.

2. After compaction, layers of fill are not to exceed twelve (12) inches for cohesive soils or eight (8) inches for noncohesive soils.

3.04 STRUCTURE, ROADWAY, AND EMBANKMENT EXCAVATION

A. **General:** Except when specifically provided to the contrary, excavation shall include the removal of all materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the work. The removal of said materials shall conform to the lines and grades shown or ordered. Unless otherwise provided, the entire construction site shall be stripped of all vegetation and debris, and such material shall be removed from the site prior to performing any excavation or placing any fill. The CONTRACTOR shall furnish, place, and maintain all supports and shoring that may be required for the sides of the excavations, and all pumping, ditching, or other measure for the removal or exclusion of water, including taking care of storm water, groundwater, and wastewater reaching the site of the work from any source so as to prevent damage to the work or adjoining property. Excavations shall be sloped or otherwise supported in a safe manner in accordance with applicable State safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926).

B. **Excavation Beneath Structures and Embankments:** Except where otherwise specified for a particular structure or ordered by the ENGINEER, excavation shall be carried to the grade of the bottom of the footing or slab. Where shown or ordered, areas beneath structures or fills shall be over-excavated. The subgrade areas beneath embankments shall be excavated to remove not less than the top 6 inches of native material and where such subgrade is sloped, the native material shall be benched. When such over

excavation is shown, both over-excavation and subsequent backfill to the required grade shall be performed by the CONTRACTOR. When such over-excavation is not shown but is ordered by the ENGINEER, such over-excavation and any resulting backfill will be paid for under a separate unit price bid item if such bid item has been established; otherwise payment will be made in accordance with a negotiated price. After the required excavation or over-excavation has been completed, the exposed surface shall be scarified to a depth of 6 inches, brought to optimum moisture content, and rolled with heavy compaction equipment to obtain 98 percent of maximum density.

C. **Excavation Beneath Paved Areas:** Excavation under areas to be paved shall extend to the bottom of the aggregate base or subbase, if such base is called for; otherwise it shall extend to the paving thickness. After the required excavation has been completed, the top 12 inches of exposed surface shall be scarified, brought to optimum moisture content, and rolled with heavy compaction equipment to obtain 98 percent of maximum density. The finished subgrade shall be even, self-draining, and in conformance with the slope of the finished pavement. Areas that could accumulate standing water shall be regraded to provide a self-draining subgrade.

D. **Notification of ENGINEER:** The CONTRACTOR shall notify the ENGINEER at least 3 days in advance of completion of any structure excavation and shall allow the ENGINEER a review period of at least one day before the exposed foundation is scarified and compacted or is covered with backfill or with any construction materials.

3.05 PIPELINE AND UTILITY TRENCH EXCAVATION

A. **General:** Unless otherwise shown or ordered, excavation for pipelines and utilities shall be open-cut trenches. Trench widths shall be kept as narrow as is practical for the method of pipe zone densification selected by the CONTRACTOR, but shall have a minimum width at the bottom of the trench equal to the outside diameter of the pipe plus 24 inches for mechanical compaction methods and 18 inches for water consolidation methods. The maximum width at the top of the trench shall be equal to the outside diameter of the pipe plus 36 inches for pipe diameters 18 inches and larger and to the outside diameter of the pipe plus 24 inches for pipe diameters less than 18 inches, or as shown on the Drawings.

B. **Trench Bottom:** Except when pipe bedding is required, the bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe. The trench bottom shall be given a final trim, using a string line for establishing grade, such that each pipe section when first laid will be continually in contact with the ground along the extreme bottom of the pipe. Rounding out the trench to form a cradle for the pipe will not be required. Excavations for pipe bells and welding shall be made as required.

C. **Open Trench:** The maximum amount of open trench permitted in any one location shall be 300 feet, or the length necessary to accommodate the amount of pipe installed in a single day, whichever is greater. All trenches shall be fully backfilled at the end of each day or, in lieu thereof, shall be covered by heavy steel plates adequately braced and

capable of supporting vehicular traffic in those locations where it is impractical to backfill at the end of each day. The above requirements for backfilling or use of steel plate will be waived in cases where the trench is located further than 100 feet from any traveled roadway or occupied structure. In such cases, however, barricades and warning lights meeting OSHA requirements shall be provided and maintained. Requirements of Section 01550, Section 1.02B shall also apply.

D. **Trench Over-Excavation:** Where the Drawings indicate that trenches shall be over-excavated, they shall be excavated to the depth shown, and then backfilled to the grade of the bottom of the pipe.

E. **Over-Excavation:** When ordered by the ENGINEER, whether indicated on the Drawings or not, trenches shall be over-excavated beyond the depth shown. Such over-excavation shall be to the depth ordered. The trench shall then be backfilled to the grade of the bottom of the pipe. All work specified in this Section shall be performed by the CONTRACTOR when the over-excavation ordered by the ENGINEER is less than 6 inches below the limits shown. When the over-excavation ordered by the ENGINEER is 6 inches or greater below the limits shown, additional payment will be made to the CONTRACTOR for that portion of the work which is located below said 6-inch distance. Said additional payment will be made under separate unit price bid items for over-excavation and bedding if such bid items have been established; otherwise payment will be made in accordance with a negotiated price.

F. Where pipelines are to be installed in embankment or structure fills, the fill shall be constructed to a level at least one foot above the top of the pipe before the trench is excavated.

3.06 OVER-EXCAVATION NOT ORDERED, SPECIFIED, OR SHOWN

A. Any over-excavation carried below the grade ordered, specified, or shown, shall be backfilled to the required grade with the specified material and compaction. Such work shall be performed by the CONTRACTOR at its own expense.

3.07 EXCAVATION IN LAWN AREAS

A. Where excavation occurs in lawn areas, the sod shall be carefully removed, kept damp, and stockpiled to preserve it for replacement. Excavated material may be placed on the lawn; provided that a drop cloth or other suitable method is employed to protect the lawn from damage. The lawn shall not remain covered for more than 72 hours. Immediately after completion of backfilling and testing of the pipeline, the sod shall be replaced and lightly rolled in a manner so as to restore the lawn as near as possible to its original condition. CONTRACTOR shall provide new sod if stockpiled sod has not been replaced within 72 hours.

3.08 EXCAVATION IN VICINITY OF TREES

A. Except where trees are shown to be removed, trees shall be protected from injury during construction operations. No tree roots over 2 inches in diameter shall be cut without express permission of the ENGINEER. Trees shall be supported during excavation by any means previously reviewed and approved by the ENGINEER.

3.09 ROCK EXCAVATION

A. Rock is defined as follows:

1. Rock shall be classified as material having a blow count in excess of 30 blows per foot from a Standard Penetration Test (ASTM D-1586) and exceeding 1000 psi from an Unconfined Compression Strength Test (ASTM D-2938); and,

2. General Excavation - Any material that cannot be excavated with a single-toothed ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 71,000 lbs. (Caterpillar D9N or equivalent), and occupying an original volume of at least 2 cubic yards or more; and,

3. Trench Excavation - Any material that cannot be excavated with a backhoe having a break out force rated at not less than 44,000 lbs. (Caterpillar 235D or equivalent), and occupying an original volume of at least 2 cubic yards.

B. Rock excavation shall include removal and disposal of the following: (1) all boulders measuring 1/3 of a cubic yard or more in volume; (2) all rock material in ledges, bedding deposits, and unstratified masses which cannot be removed without systematic drilling and blasting; (3) concrete or masonry structures which have been abandoned; and (4) conglomerate deposits which are so firmly cemented that they possess the characteristics of rock as described in Paragraph 3.09(A).

C. Said rock excavation shall be performed by the CONTRACTOR; provided, that should the quantity of rock excavation be affected by any change in the scope of the work, an appropriate adjustment of the contract price will be made under a separate bid item if such bid item has been established; otherwise payment will be made in accordance with a negotiated price.

D. Explosives and Blasting: Blasting will not be permitted, except by express permission of the ENGINEER on a case-by-case basis. The use of explosives will be subject to the approval and regulations of all agencies having jurisdiction. If blasting is utilized at the site of the WORK, the CONTRACTOR shall take all precautions and provide all protective measures necessary to prevent damage to property and structures or injury to person. Prior to blasting, the CONTRACTOR shall secure all permits required by law for blasting operations and shall provide any additional hazard insurance required by the OWNER. The CONTRACTOR shall have a fully qualified and experienced blasting foreman in charge of all blasting operations.

E. The CONTRACTOR will be held responsible for all and shall make good any damage caused by blasting or resulting from its possession or use of explosives on the WORK.

F. All operations involving the handling, storage, and use of explosives shall be conducted in accordance with the requirements of the OSHA Standards for Construction, and in accordance with all local laws and regulations.

3.10 DISPOSAL OF UNSUITABLE EXCAVATED MATERIAL

A. The CONTRACTOR shall remove and dispose of all unsuitable excavated material. This shall include muck, tree roots, rocks, garbage, debris, or any other material designated as unsuitable by Paragraph 2 of this Section. Disposal shall be at a site selected by the CONTRACTOR that is designated as an approved disposal site for the unsuitable material.

3.11 BACKFILL - GENERAL

A. Backfill shall not be dropped directly upon any structure or pipe. Backfill shall not be placed around or upon any structure until the concrete has attained sufficient strength to withstand the loads imposed. Backfill around water retaining structures shall not be placed until the structures have been tested, and the structures shall be full of water while backfill is being placed.

B. Except for drainrock materials being placed in over-excavated areas or trenches, backfill shall be placed after all water is removed from the excavation.

3.12 PLACING AND SPREADING OF BACKFILL MATERIALS

A. Backfill materials shall be placed and spread evenly in layers. When compaction is achieved using mechanical equipment the layers shall be evenly spread so that when compacted each layer shall not exceed 6 inches in thickness.

B. During spreading each layer shall be thoroughly mixed as necessary to promote uniformity of material in each layer. Pipe zone backfill materials shall be manually spread, tamped, and haunched around the pipe so that when compacted the pipe zone backfill will provide uniform bearing and side support.

C. Where the backfill material moisture content is below the optimum moisture content water shall be added before or during spreading until the proper moisture content is achieved.

D. Where the backfill material moisture content is too high to permit the specified degree of compaction the material shall be dried until the moisture content is satisfactory.

3.13 COMPACTION - GENERAL

A. Compact each layer of fill in designated areas with approved equipment to achieve a maximum density at optimum moisture, AASHTO T 180 - latest edition.

1. Building Pads: compaction shall be to 98% of maximum density, unless otherwise shown on the drawings or specifications. Building pads shall be within plus or minus one-tenth (0.1) of a foot of the elevations shown on the plans.

2. Refer to Sections 02741 Asphaltic Concrete Paving and 02751 Portland Cement Concrete Paving for compaction requirements in the affected areas.

3. Under landscaped area, compaction shall be to 85% of maximum density, unless otherwise shown on the drawings.

B. No backfill shall be placed against any masonry or other exposed building surface until permission has been given by the ENGINEER and in no case until the masonry has been in place seven days.

C. Heavy construction equipment will not be permitted within ten (10) feet of any masonry or other exposed building surface.

D. Compaction in limited areas shall be obtained by the use of mechanical tampers or approved hand tampers. When hand tampers are used, the materials shall be deposited in layers not more than four inches thick. The hand tampers used shall be suitable for this purpose and shall have a face area of not more than 100 square inches. Special precautions shall be taken to prevent any wedging action against masonry, or other exposed building surfaces.

3.14 COMPACTION OF FILL, BACKFILL, AND EMBANKMENT MATERIALS

A. Each layer of Types 1, 2, 3, 7, 8, and 14 backfill materials as defined herein, where the material is graded such that at least 10% passes a No. 4 sieve, shall be mechanically compacted to the specified percentage of maximum density. Equipment that is consistently capable of achieving the required degree of compaction shall be used and each layer shall be compacted over its entire area while the material is at the required moisture content.

B. Each layer of Type 4, 5, 6, and 13 backfill materials shall be compacted by means of at least 2 passes from a flat plate vibratory compactor. When such materials are used for pipe zone backfill, vibratory compaction shall be used at the top of the pipe zone or at vertical intervals of 24 inches, whichever is the least distance from the subgrade.

C. Type 9 and 10 material requires mechanical spreading and placement to fill voids but does not require mechanical compaction or vibration. Tamping shall be used in pipe zone areas.

D. Fill on structure roof slabs shall be deposited at least 30 days after the concrete roof slab has been placed. Equipment weighing more than 10,000 pounds when loaded shall not be used on a roof. A roller weighing not more than 8,000 pounds shall be used to compact fill on a roof.

E. Flooding, ponding, or jetting shall not be used for fill on roofs, backfill around structures, backfill around reservoir walls, for final backfill materials, or aggregate base materials.

F. Pipe zone backfill materials that are granular may be compacted by a combination of flooding and vibration using concrete vibrators or by jetting, when acceptable to the ENGINEER. Tamping shall be used to ensure adequate bedding in the pipe zone.

G. Pipeline trench zone backfill materials, containing 5% or less of material passing a No. 200 sieve, may be compacted using flooding and jetting or vibration if the CONTRACTOR uses effective procedures that yield the specified compaction test results. Flooding and jetting shall not be done in such a manner that the pipe or nearby utilities are damaged, in areas of poorly draining or expansive soils, or where the use of the procedure is prohibited by any agency having jurisdiction over the street or right-of-way. Approved jet pipes or immersible vibrators shall be used so that each backfill layer is saturated and consolidated to its full depth before the next layer is placed. Jet pipes shall be kept at least 6 inches away from the pipe where the backfills being consolidated and 2 feet away from other pipes or utilities.

H. Equipment weighing more than 10,000 pounds shall not be used closer to walls than a horizontal distance equal to the fill at that time. Hand operated power compaction equipment shall be used where use of heavier equipment is impractical or restricted due to weight limitations.

I. Compaction Requirements: The following compaction test requirements shall be in accordance with AASHTO T-180, T-99-C or ASTM D 2487 as applicable. Where agency or utility company requirements govern, the highest compaction standards shall apply.

Location or Use of Fill	Percentage of Maximum Density AASHTO T-180	Testing Frequency 1 per lift per
Pipe zone backfill portion above bedding for flexible pipe.	100	100 lf
Pipe zone backfill bedding and over-excavated zones under bedding/pipe for flexible pipe, including trench plugs.	100	100 lf

Pipe zone backfill portion above bedding for rigid pipe.	100	100 lf
Pipe zone backfill bedding and over-excavated zones under bedding/pipe for rigid pipe.	100	100 lf
Final backfill, beneath paved areas or structures.	100	10,000 sf
Final backfill, not beneath paved areas or structures.	95	20,000 sf
Trench zone backfill, not beneath paved areas or structures, including trench plugs.	95	100 lf
Embankments.	98	20,000 sf
Embankments, beneath paved areas or structures.	100	10,000 sf
Backfill beneath structures, hydraulic structures.	100	100 sf
Backfill around structures.	98	100 sf
Topsoil (type 14 material)	85	20,000 sf
Aggregate base or subbase (type 11 or 12 material)	100	10,000 sf

J. Trench Backfill Requirements: the pipe has been structurally designed based upon the trench configuration specified herein.

K. The CONTRACTOR shall maintain the indicated trench cross section up to a horizontal plane lying 6 inches above the top of the pipe.

L. If, at any location under said horizontal plane, the CONTRACTOR slopes the trench walls or exceeds the maximum trench widths indicated in the Contract Documents, the pipe zone backfill shall be "improved" or the pipe class increased as specified herein, at no additional cost to the OWNER. "Improved" backfill shall mean sand-cement backfill or other equivalent materials acceptable to the ENGINEER.

M. If the allowable deflection specified for the pipe is exceeded, the CONTRACTOR shall expose and reround or replace the pipe, repair all damaged lining and coating, and reinstall the pipe zone material and trench backfill as specified at no additional expense to the OWNER.

3.15 PIPE AND UTILITY TRENCH BACKFILL

A. Pipe zone Backfill: The pipe zone is defined as that portion of the vertical trench cross-section lying between a plane 6 inches below the bottom surface of the pipe, i.e., the trench subgrade, and a plane at a point 6 inches above the top surface of the pipe. The bedding for flexible pipe is defined as that portion of pipe zone backfill material between the trench subgrade and the bottom of the pipe. The bedding for rigid pipe is defined as that portion of the pipe zone backfill material between the trench subgrade and a level line which varies from the bottom of the pipe to the springline as shown.

B. Bedding shall be provided for all sewers, drainage pipelines, and other gravity flow pipelines. Unless otherwise specified or shown, for other pipelines the bedding may be omitted if all the following conditions exist.

1. The pipe bears on firm, undisturbed native soil which contains only particles that will pass a one-inch sieve.

2. The excavation is not through rock or stones.

3. The trench subgrade soils are classified as suitable fill and backfill materials per Paragraph 2.01.

4. The trench subgrade soils have, as a maximum, a moisture content that allows compaction.

C. Where bedding is required, after compacting the bedding the CONTRACTOR shall perform a final trim using a stringline for establishing grade, such that each pipe section when first laid will be continually in contact with the bedding along the extreme bottom of the pipe. Excavation for pipe bells and welding shall be made as required.

D. The pipe zone shall be backfilled with the specified backfill material. The pipe zone shall be well tamped per manufacturer's recommendation to prevent sags or settlement of the pipe. The CONTRACTOR shall exercise care to prevent damage to the pipeline coating, cathodic bonds, or the pipe itself during the installation and backfill operations.

E. Trench Zone Backfill: After the pipe zone backfill has been placed as specified above, and after all excess water has completely drained from the trench, backfilling of the trench zone may proceed. The trench zone is defined as that portion of the vertical trench cross-section lying between a plane 6 inches above the top surface of the pipe and a plane at a point 18 inches below the finished surface grade, or if the trench is under pavement, 18 inches below the roadway subgrade. If flooding, ponding, or jetting is used the pipe shall be filled with water to prevent flotation.

F. Final Backfill: Final backfill is all backfill in the trench cross-sectional area within 18 inches of finished grade, of if the trench is under pavement, all backfill within 18 inches of the roadway subgrade.

3.16 EMBANKMENT CONSTRUCTION

A. The area where an embankment is to be constructed shall be cleared of all vegetation, roots and foreign material. Following this, the surface shall be moistened, scarified to a depth of 6 inches, and rolled or otherwise mechanically compacted. Embankment fill material shall be placed and spread evenly in approximately horizontal layers. Each layer shall be moistened or aerated, as necessary. Unless otherwise approved by the ENGINEER, each layer shall not exceed 6 inches of compacted thickness. The embankment fill and the scarified layer of underlying ground shall be compacted to 95% of maximum density under structures and paved areas, and 90% of maximum density elsewhere.

B. When an embankment fill is to be made and compacted against hillsides or fill slopes steeper than 4:1, the slopes of hillsides or fills shall be horizontally benched to key the embankment fill to the underlying ground. A minimum of 12 inches normal to the slope of the hillside or fill shall be removed and recompacted as the embankment fill is brought up in layers. Material thus cut shall be recompacted along with the new fill material at the CONTRACTOR's expense. Hillside of fill slopes 4:1 or flatter shall be prepared in accordance with Paragraph A, above.

C. Where embankment or structure fills are constructed over pipelines, the first 4 feet of fill over the pipe shall be constructed using light placement and compaction equipment that does not damage the pipe. Heavy construction equipment shall maintain a minimum distance from the edge of the trench equal to the depth of the trench until at least 4 feet of fill over the pipe has been completed.

3.17 COMPACTION OF SUBGRADE SURFACES

A. Any soft areas exhibiting excessive weaving or unsatisfactory material identified during excavation, fill placement, compaction and proof testing shall be removed, replaced with suitable fill, and compacted as specified.

B. Prior to preparing the subgrade in low lying areas, perform the following procedures:

1. Drain standing water by gravity or with a pump. Water should not be discharged directly to a storm drain system;

2. After drainage of low area is complete, remove mulch, mud, debris, and other unsuitable material using equipment and methods that will minimize disturbance to the underlying soils;

3. Thoroughly compact subgrade as specified.

4. If proposed for fill, all muck, mud and other materials removed from above low areas shall be dried on-site by spreading in thin layers for observation by OWNER or owner's representative. If, after observation by OWNER material is found to be unsuitable, it shall be removed from the site.

3.18 UNDERCUT EXCAVATION

A. When approved by OWNER and recommended by the ENGINEER, the CONTRACTOR may be required to remove natural soil materials in areas where fills are to be placed when determined to be undesirable in their location or condition. The CONTRACTOR shall be required to remove the undesirable material and backfill with approved material properly compacted.

B. At locations where unstable soil is shown on the drawings or identified within the geotechnical engineering study, the removal and replacement of such soil shall be as directed on the drawings or as directed by the ENGINEER and the OWNER.

C. At locations where soil is wet of optimum moisture, the CONTRACTOR shall provide a “good faith” effort in drying and discing these areas prior to completing undercut excavation as approved by the ENGINEER and OWNER.

D. Where undercutting is required adjacent or beneath the location of the proposed drainage structure, undercut and backfill shall be done over a sufficient distance adjacent to the installation to prevent future operations from disturbing the completed drainage structure.

E. All material removed in the work of undercut excavation will be classified by the geotechnical engineer and OWNER as either suitable for other use without excessive manipulation and utilized by the CONTRACTOR elsewhere in the work, or unsuitable for future use and disposed of by the CONTRACTOR as directed by the ENGINEER.

F. The CONTRACTOR shall conduct undercut operations in such a way that the necessary measurements can be taken before any backfill is placed.

G. Backfill in undercut areas shall be placed as a continuous operation along with the undercutting operation. No backfill material shall be placed in water unless otherwise permitted by the ENGINEER.

3.19 EXCAVATION, FILL, AND SUBGRADE PREPARATION

A. General

1. The building limits shall be as identified on the construction drawings. The building subgrade shall be constructed to include a minimum of 10 feet beyond the building limits, or as directed by the OWNER;

2. Structures include buildings, footings, foundations, retaining walls, embankment berms for storm water detention basins, slabs, tanks, curbs, mechanical and

electrical appurtenances or other man-made stationary features constructed above or below the ground surface;

3. The building pad subgrade shall be prepared in strict accordance with the geotechnical engineering study and these specifications, whichever is more stringent; and,

4. The CONTRACTOR shall cut or fill to the proposed subgrade elevations based on finished grades and the pavement thicknesses as shown on the drawings. Subgrade elevations shall be constructed to within 0 to minus ½ inch of the proposed grades specified.

B. Excavation

1. Where existing grades are above proposed subgrade elevation, excavate materials in the building areas to line and grade as shown in the drawings being careful not to over excavate beyond the elevations needed for building subgrades;

2. Excavate organic soils from within the building area. Excavated on-site organic soils, which are unsuitable for building fill, may be used in landscaped areas. Otherwise this material shall be disposed of off-site;

3. Unsuitable material, such as wood and any other deleterious materials determined to be unsuitable by the geotechnical engineer for use as on-site fill, shall be disposed of off site.

C. Subgrade Preparation For Fill

1. Existing grades below building areas shall be leveled prior to fill placement. The CONTRACTOR shall remove existing lawn and top soil in these areas prior to placement of any fill; and,

2. All existing grades below building areas shall be proofrolled and compacted per this section.

D. Fill Placement

1. No fill material shall be placed in areas of standing water, in areas of frozen or thawing ground, or in areas that have not been approved by the ENGINEER;

2. No fill materials shall be placed during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until all saturated surficial soils are returned to satisfactory moisture content as determined by the ENGINEER;

3. Fill lift surfaces shall be made smooth and free from ruts or indentations at the end of any workday when precipitation is forecast to prevent saturation of surficial fill material. Fill surfaces shall be graded to drain and sealed with a smooth drum roller at the completion of each work day;

4. The fill shall be placed in uniform loose lifts not exceeding 12 inches and compacted in systemic method to achieve at least 6 passes of the compactor. Larger lift thickness, but no greater than 2 feet shall be permitted if broken rock is utilized and placed at least 6 feet below of finished grade;

5. Shot rock may be utilized as engineered fill as approved by the ENGINEER;

6. Each lift shall be compacted to the minimum densities listed in this section as appropriate for the project and as specified in the geotechnical engineering study;

7. The CONTRACTOR shall adjust the water content by aeration or adding water to achieve the required density. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to achieve proper compaction and facilitate the construction schedule;

8. Wet, saturated material shall be air dried as necessary to achieve the field densities specified in this Section. Removal and replacement shall not occur without prior approval or OWNER. Removal and replacement shall be used if necessary to facilitate the construction schedule;

9. Remove areas of finished subgrade found to have insufficient compaction density of depth necessary and replace with suitable compacted fill as approved by the OWNER or ENGINEER. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true to grade and cross-section; and,

10. Fill placed on slopes greater than 1 vertical to 3 horizontal shall have each lift benched onto the slope at least 3 feet.

3.20 PROOFROLLING

A. The work covered by this subsection consists of furnishing and operating, proofrolling equipment at the direction of the ENGINEER.

B. Proofrolling shall be under the observation of the geotechnical engineer as described herein and under the following schedule:

1. Immediately following the completion of excavation to proposed subgrades in cut areas, proofrolling shall be performed as specified; and,

2. Immediately **prior to and following** stone base course placement, in pavement and building pad areas for final floor slab preparation, all subgrade and stone base areas shall be proofrolled. Any areas which deflect, rut or pump under the loaded

dump truck shall be undercut and replaced with compacted fill material or stone base course as directed by the ENGINEER and approved by the OWNER, at no additional cost to the OWNER.

C. Proofrolling shall be done with 1 pass of a fully loaded tandem dump truck equal to or exceeding 50,000 lbs or other construction equipment if approved by the ENGINEER.

D. Construction methods shall be as follows:

1. After the subgrade or stone base course has been completed the subgrade or stone base course shall then be proofrolled. The coverage areas and methods will be identified by the ENGINEER;

2. The equipment shall be operated at a speed that the ENGINEER can comfortably and slowly walk along side the equipment;

3. If it becomes necessary to take corrective action, such as but not limited to underdrain installation, undercut and backfill of an unsuitable material, and aeration of excessively wet material in areas that have been proofrolled, see Paragraph 3.18. These areas shall be proofrolled again following the completion of the necessary corrections. If the corrections are necessary due to the negligence of the CONTRACTOR, the corrective work and additional proofrolling shall be performed by the CONTRACTOR at no cost to the OWNER;

4. The CONTRACTOR shall protect all structural facilities on the project, such as but not limited to box culverts, pipe culverts, and utilities, from damage by the proofrolling equipment.

3.21 MAINTENANCE OF SUBGRADE

A. Finished subgrades shall be verified by the CONTRACTOR to ensure proper elevation and conditions for construction above subgrade.

B. Protect subgrade from excessive construction traffic and wheel loading including concrete and dump trucks.

C. Remove areas of finished subgrade judged to be unsatisfactory to the depth necessary and replace in a manner that will comply with compaction requirements by use of material equal to or better than the best subgrade material on site. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true to grade and cross-section.

3.22 CORRECTION OF GRADE

A. Bring to required grade levels areas where settlement, erosion or other grade changes occur.

3.23 MAINTENANCE AND PROTECTION OF WORK

A. While construction is in progress adequate drainage for the roadbed shall be maintained at all times.

B. The CONTRACTOR shall maintain all earthwork construction throughout the life of the contract, unless otherwise provided, and shall take all reasonable precautions to prevent loss of material from the roadway due to the action of wind or water. They shall repair at their expense, except as otherwise provided herein, any slides, washouts, settlement, subsidence, or other mishap which may occur prior to final acceptance of the work.

C. All channels excavated as a part of the contract work shall be maintained against natural shoaling or other encroachments to the lines, grades, and cross sections shown on the plans, until final acceptance of the project.

3.24 AS-BUILT SURVEY

A. At the completion of the work and prior to final inspection of the area, the CONTRACTOR shall provide the ENGINEER with an as-built topographic survey made by a registered Professional Surveyor & Mapper, of the State of Florida.

B. The Professional Surveyor & Mapper is to certify on the survey whether or not the as-built conditions conform to the elevations shown on the Drawings to within plus or minus one-tenth (.1) of a foot.

3.25 MEASUREMENT AND PAYMENT

A. There shall be no special measurement or payment for the work under this section, it shall be included in the associated bid item for this work.

END OF SECTION 02300

SECTION 02305

EXCAVATION AND BACKFILLING FOR UTILITIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 SUMMARY

A. Work under this section shall include, but not be limited to excavating trenches for the installation of storm drains and utilities, backfilling trench with bedding material as specified and finish filling trenches with suitable material to proposed subgrade, compacting subgrade, bedding, and backfill materials, and compliance with all environmental and health and safety regulations.

B. This work shall include all labor and materials and equipment necessary to meet all applicable requirements as specified in the contract documents.

1.03 REFERENCED SECTIONS

A. Section 02300 - Earthwork

B. Section 02510 - Water Distribution System

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM) Latest Edition

1. D 422 Method for Particle Size Analysis

2. D 698 Test of Moisture Density Relations of Soils - Standard Proctor Method

3. D 1557 Test for Moisture-Density Relations of Soils Using 10-lb. (4.5 Kg) Hammer and 18-inch (457 mm) Drop (Modified Proctor)

4. D 2216 Laboratory Determination of Moisture Content of Soil

5. D 2487 Classification of Soils for Engineering Purposes

6. D 2922 Tests for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

7. D 3017 Test for Moisture Content of Soil and Soil-ggregate in Place by Nuclear Methods (Shallow Depth)

8. D 4318 Test for Plastic Limit, Liquid Limit, & Plasticity Index of Soils

B. American Association of State Highway and Transportation Officials (AASHTO) latest edition

1. T 88 Mechanical Analysis of Soils

2. M 43 Standard Sizes of Coarse Aggregate for Highway

C. National Electric Code

1. NEC 300-5

2. NEC 710-36

1.05 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of all subsurface utilities, structures and obstructions encountered.

B. Accurately record any as-built variation from the construction drawings and specifications. The CONTRACTOR shall provide final as-built drawings at time of substantial completion.

C. If portions of the work are to be certified for use prior to the completion of the project, the CONTRACTOR shall provide final as-built drawings 30 days prior to the anticipated date of use of that portion of the utility.

1.06 QUALITY ASSURANCE

A. An ENGINEER shall perform construction inspection and testing on backfilling operations as stated herein. This inspection will not relieve the CONTRACTOR from their responsibility to complete the work in accordance with the drawings and specifications.

1.07 SUBMITTALS

A. The CONTRACTOR shall contact all utility companies and identify any requirements. CONTRACTOR shall provide written confirmation of the status of all utility construction to the OWNER at the time of the preconstruction conference or no later than 30 days following the project NTP.

B. Submit a sample of each type of offsite fill and/or bedding material that is to be used in backfilling in accordance with Section 02300 - Earthwork.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Backfill material shall be as specified and approved by the OWNER and/or the ENGINEER.

B. Bedding Material: Bedding material shall only be utilized when specified on the drawings. Bedding material shall conform to ASTM #67 aggregate free from debris, clay lumps, organic, or other deleterious material and consist of in-situ granular material or washed and graded limerock (3/8”-7/8”). Bedding material shall be placed 4” below bottom of pipe and extend to spring line of pipe.

PART 3 - EXECUTION

3.01 PREPARATION

A. Set all lines, elevations, and grades for utility and drainage system work and maintain for the duration of work. Provide careful maintenance of benchmarks, property corners, monuments, or other reference points.

B. Protect and maintain in operating condition, existing utilities encountered during utility installation. Repair any damage to surface or subsurface improvements shown on Drawings.

C. Verify location, size, elevation, and other pertinent data required to make connections between existing utilities, drainage systems, and proposed construction indicated on Drawings. Coordinate all building utility connection locations and elevations with existing conditions. CONTRACTOR shall comply with all local codes and regulations.

3.02 EXCAVATION

A. General: This work shall consist of the excavation of whatever substances shall be encountered to the depths as shown on the plans. Excavated materials not required for fill or backfill shall be removed from the work site as directed by the ENGINEER and shall be considered to be a part of the bid price of the utility pipe for which excavation and backfill is required.

B. Contact regulatory authorities having jurisdiction and utility companies before excavation begins. Dig trenches at proper width and depth for laying pipe, conduit, or cable and in accordance with utility company requirements. Cut trench banks for safety and remove stones as necessary to avoid point-bearing.

C. All excavation side walls shall be sloped, shored, sheeted, braced or otherwise supported by means of sufficient strength to protect the workmen within them in accordance with the applicable rules and regulations established for construction by the Department of Labor, Occupational Safety and Health Administration (OSHA), and by regulatory

authorities having jurisdiction, codes and ordinances. Such bracing or shoring shall be considered to be part of the bid price of the pipe for which excavation and backfill is required.

The CONTRACTOR shall furnish, put in place and maintain such sheeting, bracing, as may be required to support the side of the excavation, and to prevent any movement which can in any way damage the work or endanger adjacent structures. If the ENGINEER is of the opinion that supports are insufficient, they may order additional supports. The compliance with such order shall not release the CONTRACTOR from their responsibility for the sufficiency of the sheeting.

The CONTRACTOR shall leave all sheeting in place. The ENGINEER may require sheeting to be cut off at any specified elevation, but in no case will any sheeting be left closer than three (3) feet below the natural surface, nor cut off below the elevation of the top of the pipe.

D. Provide uniform bearing and support for each section of pipe at every point along the entire length, except where necessary to excavate for bell holes, pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer, or wider than needed to make the joint connection properly.

E. During excavation, stockpile excavated material suitable for backfilling in an orderly manner far enough from the trench to avoid overloading and slides.

F. Any abandoned structures utilities or debris discovered during excavation shall be removed and disposed of, or capped.

G. Utility alignments have been designed to avoid expected obstructions wherever possible. If unanticipated significant obstructions are encountered during utility installation work immediately notify the OWNER.

H. Prevent surface water from flowing into trenches or other excavations by temporary grading or other methods, as necessary. Remove accumulated water in trenches or other excavations by pumping or other acceptable methods. Water shall not be directly pumped to the sewer system.

I. Utility installation shall meet the following minimum pipe installation depths, or applicable codes and ordinances, measured from finished grade.

1. Water Mains: 36 inches to top of pipe barrel for PVC or 30 inches to top of pipe barrel for DIP or as specified on the plans;

2. Sanitary Sewer: Elevations, and grades as indicated on drawings;

3. Storm Sewer: Elevations, and grades as shown on drawings;

4. Electrical Conduits: 24 inches to top of secondary service conduits, 36 inches minimum to the top of primary service conduits, or as required by NEC 300-5, NEC 710-36 codes, or the regulatory authorities having jurisdiction, and utility company requirements, whichever is deeper;

5. Telephone Conduits: 24 inches to top of conduit, or as required by the regulatory authorities having jurisdiction and utility company, whichever is deeper; and,

J. Excavation for structures and other accessories shall have a minimum clearance of twelve inches and a maximum clearance of twenty-four inches on all sides.

K. Excavation shall not be carried below the required depths as indicated by the plans. Excess excavation below the required level shall be backfilled at the CONTRACTOR's expense with sharp sand, gravel or other suitable material thoroughly compacted and approved by the ENGINEER.

L. Any unstable soil shall be removed and shall be replaced by material acceptable to the ENGINEER. The removal and replacement of such unstable soil shall be considered to be part of the bid price of the pipe for which excavation and backfill is required.

M. Water shall not be permitted to accumulate in the excavated area. It shall be removed by pumping or other means as approved by the ENGINEER. The removal of water shall be considered to be a part of the bid price of the pipe for which excavation and backfill is required.

Well points, pumps or other approved means shall be used to keep the ground water sufficiently low in the opinion of the ENGINEER to permit the placing of concrete, masonry or pipe in first class condition, and sufficiently long thereafter to protect the concrete, masonry or joints against washing or damage.

The CONTRACTOR shall also use such other means as may be necessary to keep the excavation in satisfactory condition for the construction of the work, and the use of well points, or other approved method, will not relieve the CONTRACTOR of their responsibility to make structures water tight.

Predigging of trenches in order to install well point systems shall be included in the bid price of the pipe.

N. Banks and trenches shall be vertical unless shown otherwise on plans. The width of the trench shall be twelve inches (12"), or as approved by the ENGINEER, on each side of the pipe bell for pipe up to 16" diameter. Bell holes shall be accurately excavated by hand.

O. If the bottom of the trench is rock, the excavation shall be carried eight inches below the invert of the pipe and backfilled with thoroughly compacted sharp sand, gravel or other suitable material approved by the ENGINEER.

P. Rock excavation shall include any material as described in Section 02300 “Earthwork” Paragraph 3.09 (A).

Q. Haunching, including tamping, material, and compaction, shall be in conformance with the pipe manufacturer’s recommendation.

3.03 PIPE BEDDING (When Specified)

A. Accurately cut trenches for pipe or conduit to designated line and grade 6 inches below the bottom of the pipe, to width as specified previously. Compact trench bedding material to 98% of the maximum dry density as determined by AASTHO T-180.

B. Over excavate wet or unstable soil, if encountered, from trench bottom as necessary to provide a suitable base for continuous and uniform bedding.

C. Place bedding material and compact in 6 inch lifts to obtain 98% of the maximum dry density per AASTHO T-180. Accurately shape bedding material to conform to lower portion of pipe barrel. After pipe installation, place and compact bedding material as specified above in maximum 6-inch layers to the springline of the pipe.

3.04 BACKFILLING

A. After pipes, structures and other appurtenances have been installed, the trench or opening shall be backfilled with material non-cohesive and non plastic, free of all debris, lumps, clods, wood, broken paving or any organic or unstable materials and to a quality acceptable to the ENGINEER.

B. Backfill around the pipe and to a point twelve inches above the top of the pipe shall be placed in six inch layers compacted with 20-pound hand tampers (mechanical compaction not allowed within twelve inches above the top of pipe). Backfilling shall follow pipe laying closely, and shall be compacted and tested at intervals of not more than one hundred (100) feet behind completed pipe laying. Backfill over pipe shall be carefully placed by experienced labor and thoroughly consolidated without shock to the pipe, and carried up uniformly on both sides of the pipe. No backfilling with bulldozers will be permitted adjacent to pipeline.

C. Within roadway right-of-ways, or within areas where pavements are to be constructed over the pipe, the remainder of the trench shall be placed in six-inch layers (compacted thickness) and shall be compacted to 98% of maximum density as determined by AASHTO T-180. CONTRACTOR will be responsible for correcting settlement in all backfilled areas whether under the pavement or otherwise.

D. In areas where no pavement is to be constructed, the backfill above the twelve-inch line above the pipe shall be compacted to a firmness approximately equal to that of the soil adjacent to the pipe trench or 98% of maximum density as determined by AASHTO T-180 in public rights of way. Backfill below the 12-inch line shall be compacted in 6-inch layers (compacted thickness) and shall be compacted to 98% of maximum density as

determined by AASHTO T-180.

3.05 EXPLOSIVES

A. The use of explosives will not be permitted.

3.06 PAYMENT

A. No separate payment is provided for work covered by this Section. All costs in connection with Excavation and Backfilling, including testing, shall be included in the bid price of any item for which excavation and backfilling is required.

END OF SECTION 02305

SECTION 02310

SITE GRADING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 WORK INCLUDED

A. The work covered by this section shall include all labor, equipment, services and materials necessary for bringing the entire site to elevations shown in the plans. The work included in this section shall include all necessary excavations for streets, ditches and swales. It shall include the construction of embankments and fills by the loading, movement, deposition and compaction of suitable fill materials resulting from above listed excavations. It shall include stockpiling of any excess material to an on-site location as specified by the OWNER.

B. It shall include rough grading within the roadways, driveways, swales, and parking lots to the elevations or cross-section details shown on the drawings.

C. It shall include the erection and maintenance of any barricades that are required for accident prevention and property protection.

D. It shall include removal and disposal of muck, rock boulders or any foreign material interfering with construction.

1.03 RELATED WORK

A. Section 02230 - Site Clearing.

B. Section 02300 - Earthwork.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 GENERAL

A. The CONTRACTOR shall acquaint himself with all work to be performed as specified and shown on the Drawings. He shall ascertain where all excavation will be required and shall be solely responsible for all excavating to complete the Contract.

3.02 PAYMENT

A. No extra payment will be allowed for type or classification of material in excavation.

3.03 MATCHING EXISTING GRADES

A. Where existing roadbed surfaces are not at the elevation required prior to subgrade compaction, the CONTRACTOR shall perform any such excavation, filling, earthmoving and grading as may be necessary to attain the proper compacted subgrade elevation before proceeding with base course construction.

3.04 UNSUITABLE MATERIAL

A. All muck, large rocks and boulders encountered during the work under this Contract shall be removed and disposed of in a manner approved by the ENGINEER.

3.05 EXCAVATION

A. All excavation shall be unclassified regardless of material encountered.

B. The CONTRACTOR shall make probings or sounding for subsurface rock to ascertain its location and depth.

C. It shall be the CONTRACTOR's responsibility to be familiar with soil conditions on the site. Borings, in addition to those provided by others, if any, shall be acquired by the CONTRACTOR, at the CONTRACTOR's expense.

D. Any wet excavated materials shall be drained before hauling or moving.

3.06 EMBANKMENT (FILL)

A. Embankment shall be constructed from suitable materials resulting from roadway or site excavation or approved materials furnished from off-site borrow areas.

B. Embankments shall be placed in successive layers of not more than eight inches in thickness, measured loose, for the full width of the embankment.

C. Each layer of the material used in the formation of roadbed embankments shall be compacted at optimum moisture content to a density of at least 98% of the Maximum Density as determined by Moisture-Density Tests AASHTO T-180 test results.

D. The existing material on the site may vary as to stability. The CONTRACTOR shall satisfy himself by site inspection borings, probings, etc., prior to bidding, as to the subsurface character of the material.

E. All unstable soil shall be removed and shall be replaced by material approved by the ENGINEER.

3.07 GRADING

A. The material excavated shall be transported and spread over the entire work site and shall be graded so that the finished grade shall be within ±0.04 feet of the grades indicated on the Contract Drawings. Due to the minimal slope of the roadways, swale grades shall be within ±0.04 feet of the grades indicated on the Contract Drawings.

B. Due to the minimal longitudinal slope of the roadways, the CONTRACTOR shall be required to demonstrate (through finish rock and first lift of asphalt as-builts) a positive flow from high points to low points along the edge of pavement and road crown as indicated on the Contract Drawings.

C. Deviations from the proposed grades and drainage patterns as indicated on drawings will be reviewed at the discretion of the ENGINEER.

D. The disposal of large rocks in excess of 8", within roadways and parking areas is prohibited. Where allowable, the disposal of large rocks by burial in areas designated by the ENGINEER shall have a minimum 30 inches of cover below finished grade elevation.

3.08 FINISH GRADING

A. Following completion of the paving work, all swales, etc., adjacent to the roadway shall be shaped and graded to the elevations and cross-sections shown on the DRAWINGS. The finished surface shall be maintained until seeding and mulching work is completed.

3.09 CONSTRUCTION OF SWALES

A. This work consists of regrading existing swales and construction of new swales adequate for conveying storm water along the right-of-way to catch basins. The swale shall be shaped according to the cross section shown on the plan. In areas adjacent to existing roadways all swales shall be regraded to match their existing condition prior to construction, unless otherwise noted.

B. Requirements: All soft and yielding material and other portions of the swale which will not compact readily shall be removed and replaced with suitable material and the entire swale area brought to the proper grade. Stumps, roots, and other deleterious organic matter encountered during the shaping for the swale shall be removed.

C. The bottom of all excavated areas and the top of all fills of swale areas shall be thoroughly compacted by rolling. Water shall be used as necessary to insure thorough compaction. The

stability of the top 12" thickness of swale area shall be at least 50 PSI as determined by the Florida Bearing Value Method. Sufficient stabilizing material shall be added to swale area soil as required to provide the specified stability.

D. The CONTRACTOR shall place sod over existing areas damaged by construction. The sod shall match the existing sod type in the affected areas.

3.10 SURVEYS

A. All initial surveys, including detail construction stakes, will be furnished by the CONTRACTOR.

B. The CONTRACTOR will carefully maintain benchmarks, monuments, stakes and other reference points, and if disturbed or destroyed, be replaced as directed at the CONTRACTOR's expense.

3.11 MEASUREMENT AND PAYMENT

A. Measurement and payment for this item will be made per square yard and shall be included in the unit price bid wherever Site Grading is required.

END OF SECTION 02310

SECTION 02370

EROSION CONTROL AND SLOPE PROTECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the erosion control installation, as indicated on the drawings, as specified herein or both.

1.03 RELATED WORK

A. Section 02300 - Earthwork

B. Section 02922 - Sodding

1.04 INTENT

A. The main concern associated with erosion on a construction site is the movement of soil off the site and its impact on water quality. It is the OWNER's intent that the CONTRACTOR install and maintain sufficient erosion control practices to retain sediment within the boundaries of the site in addition to complying with regulatory authorities having jurisdiction and local erosion and sedimentation control laws and ordinances. All erosion control methods and devices used shall conform to the latest requirements imposed by Federal, State and local authorities. The CONTRACTOR shall be responsible for repair of any damage caused and shall be financially responsible for any penalties imposed.

B. If an erosion control drawing has been included in the drawings prepared by the ENGINEER, it shall be the CONTRACTOR's responsibility to review the drawing prior to implementation. If an erosion control drawing is not included in the project documents, the CONTRACTOR shall submit, for approval, a proposed sequence of operations and a compatible method of preventing erosion.

C. The CONTRACTOR shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with FDEP document 62-621.300(4)(a). The contractor shall submit the Notice of Intent (NOI) prior to start of construction and the Notice of Termination (NOT) after the completion of construction.

1.05 SUMMARY

A. Work under this section shall include but not be limited to, installation and maintenance of both temporary and permanent soil erosion control measures, slope protection and stabilization measures, protection of all surface water and property both on and off site. This work shall include all labor, materials, and equipment necessary to meet all applicable requirements and as specified in the contract documents.

1.06 REFERENCE STANDARDS

A. All applicable standards and requirements of all regulatory authorities having jurisdiction, including local FDEP and soil conservation agencies.

1.07 QUALITY ASSURANCE

A. Soil erosion and sediment control measures shall be implemented in accordance with the requirements and procedures outlined in this specification, contract drawings and documents, the state standards or guidelines for soil erosion and sediment control, and all regulatory authorities having jurisdiction. Where conflict between requirements exist, the more restrictive rules shall govern.

B. The CONTRACTOR shall provide all temporary control measures shown on the drawings, or as directed by the ENGINEER or regulatory agencies for the duration of the contract. Erosion control drawings are intended to be a guide to address the stages of work shown. Additional erosion control measures not specified on the drawings may be necessary and shall be implemented to address intermediary stages of work and any conditions that may develop during construction at no cost to the OWNER.

C. Temporary control provisions shall be coordinated with permanent erosion control features to the extent practical to assure economical, effective and continuous erosion control throughout the construction and post-construction period.

D. Soil erosion and sediment control measures shall at all times be satisfactory to the ENGINEER. ENGINEER will inform the CONTRACTOR of unsatisfactory construction procedures and operations if observed. If the unsatisfactory construction procedures and operations are not responded to and corrected within 48 hours, OWNER may suspend the performance of any or all other construction until the unsatisfactory condition has been corrected. Such suspension shall not be the basis of any claim by the CONTRACTOR for additional compensation nor for an extension of time to complete the work. Any complaints, fines, etc. relating to ineffective erosion control, shall be the sole responsibility of the CONTRACTOR.

E. The CONTRACTOR shall inspect all soil erosion and sediment control measures at least at the beginning and end of each day to ascertain that all devices are functioning properly during construction. Maintenance of all soil erosion and sediment control measures on the project site shall be the responsibility of the CONTRACTOR until the project is 100%

complete, and until the permanent soil erosion controls are established and in proper working condition.

F. The CONTRACTOR shall protect adjacent properties and watercourses from soil erosion and sediment damage throughout construction.

1.08 SEQUENCE OF CONSTRUCTION

A. The approved construction sequence, as permitted/approved shall be adhered to during the execution of work under this section. All soil erosion and sediment control measures shall be installed in accordance with the contract documents.

PART 2 - PRODUCTS

2.01 MATERIALS

A. CONTRACTOR shall provide all materials necessary to perform the work.

B. Hold/gro as manufactured by Gulf States Paper, Tuscaloosa, Alabama or approved equal.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. Review the soil erosion and sediment control drawings as they apply to current site conditions. Any deviation from the drawings must be submitted for approval to the ENGINEER in writing at least 72 hours prior to commencing that work.

B. Notify COUNTY or municipal soil conservation district, in writing at least 72 hours prior to initial land disturbance.

C. All soil sediment and erosion control devices shall be in place prior to any earthwork construction, in their proper sequence, and maintained until permanent protection is established.

D. The limit of the area of any earthwork operations in progress shall be commensurate with the CONTRACTOR's capability and progress in keeping the finished grading, mulching, seeding and other such permanent control measures current and in accordance with the accepted schedule for construction phasing. Should seasonal limitations make such coordination unrealistic, as determined by the ENGINEER, temporary erosion control measures shall be provided immediately by the CONTRACTOR at no expense to the OWNER.

E. Temporary erosion control measures shall be used to correct conditions which develop during construction that are needed prior to installation of permanent control features, or that are temporarily needed to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

F. The CONTRACTOR shall incorporate all permanent erosion control features into the project at the earliest practical time to minimize the need for temporary controls.

G. A temporary construction entrance pad shall be installed and maintained at any point where construction vehicles enter a public right-or-way, street or parking area. The pad shall be used to eliminate mud from the construction area onto public right-of-way. Any mud or debris tracked on streets shall be cleaned up immediately.

H. Any disturbed or stockpiled areas that will be left exposed more than 30 days, and not subject to construction traffic, shall immediately receive a temporary seeding. Mulch/straw shall be used if the season prevents the establishment of a temporary cover.

I. Permanent vegetation shall be established as specified on all exposed areas within 10 days after final grading, unless otherwise directed by the OWNER and permitted by appropriate regulations. Mulch as necessary for seed protection and establishment. Lime and fertilize seedbed prior to permanent seeding.

J. Cut slopes shall be permanently seeded and mulched as the excavation proceeds to the extent considered desirable and practical. Slopes that erode easily shall be temporarily seeded and mulched.

K. All storm drainage outlets must be stabilized, as specified, before the discharge points become operational. Equip all inlets with inlet protection immediately upon construction.

L. Discharge from de-watering operations for the excavated areas shall not be directed to surface waters without first properly removing the suspended sediment through filtration and/or settlement. The CONTRACTOR shall obtain any required permits associated with dewatering activities.

M. The quantity of silt fence to be installed will be affected by the actual conditions that occur during the construction of the project. Silt fence shall be installed at locations shown on the drawings and any additional locations necessary for proper erosion control. The CONTRACTOR shall maintain the silt fence until the project is accepted and shall remove and dispose of the silt fence and silt accumulations.

N. Soil erosion and sediment control shall include but not be limited to the approved measures. The CONTRACTOR shall be responsible for providing all additional measures that may be necessary to accomplish the intent of the drawings.

O. Comply with all other requirements of authorities having jurisdiction.

3.02 SLOPE PROTECTION

A. The soil and dunes, if applicable, shall be graded as called for on the drawings prior to installation. Seed and fertilizer shall be applied immediately before laying fabric.

B. The hold/gro fabric shall be installed vertically to the slope starting from the top and running the length of the slope to the bottom. The fabric shall be overlapped a minimum of four (4)

inches at all joints. The staples shall be located nine (9) inches apart along the edge and three (3) feet apart down the center. The staples shall be installed as the fabric is rolled out. Use heavy gauge staples. The fabric shall be draped over the dune, if applicable. Stretching over voids shall be avoided.

C. When used for slope protection of sand dunes, the fabric shall be installed several days before the dune planting takes place. When planting cut an "x"-shaped opening in the fabric and insert the plant.

D. The installer shall have a representative of the factory on site to inspect the installation.

3.03 MEASUREMENT AND PAYMENT

A. There shall be no special measurement and payment for the work under this section; it shall be included in the lump sum price bid for item 'Environmental Protection Plan'.

END OF SECTION 02370

SECTION 02502

VALVES, GENERAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 WORK INCLUDED

A. The CONTRACTOR shall provide all tools, supplies, materials, equipment, and labor necessary for furnishing, epoxy coating, installing, adjusting, and testing of all valves and appurtenant work, complete and operable, in accordance with the requirements of the Contract Documents. Where buried valves are shown, the CONTRACTOR shall furnish and install valve boxes to grade, with covers, extensions, and position indicators.

B. The provisions of this Section shall apply to all valves and valve operators specified in the various Sections and Division 2 of these Specifications including test valves, except where otherwise specified in the Contract Documents. Valves and operators in particular locations may require a combination of units, sensors, limit switches, and controls specified in other Sections of these Specifications.

1.03 RELATED WORK

A. Section 02305 - Excavation and Backfilling for Utilities.

B. Section 02510 - Water Distribution System.

C. Section 02530 - Sanitary Sewerage System.

1.04 REFERENCE STANDARDS

A. **Codes:** All codes referenced herein and specified in Section 01420, "Reference Standards".

B. **Commercial Standards:**

ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.
ANSI B16.5	Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys.
ANSI/ASME B31.1	Power Piping.

ASTM A 36	Specification for Structural Steel.
ASTM A 48	Specification for Gray Iron Castings.
ASTM A 126	Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
ASTM A 536	Specification for Ductile Iron Castings.
ASTM B 61	Specification for Steam or Valve Bronze Castings.
ASTM B 62	Specification for Composition Bronze or Ounce Metal Castings.
ASTM B 148	Specification for Aluminum-Bronze Castings.
ASTM B 584	Specification for Copper Alloy Sand Castings for General Applications.
ANSI/AWWA C500	Gate Valves for Water and Sewerage Systems.
ANSI/AWWA C502	Dry-Barrel Fire Hydrants.
ANSI/AWWA C503	Wet-Barrel Fire Hydrants.
ANSI/AWWA C504	Rubber-Seated Butterfly Valves.
ANSI/AWWA C507	Ball Valves 6 Inches Through 48 Inches.
AWWA C508	Swing-Check Valves for Waterwork Service, 2 Inches Through 24 Inches NPS.
ANSI/AWWA C509	Resilient-Seated Gate Valves for Water and Sewage Systems.
ANSI/AWWA C511	Reduced-Pressure Principle Backflow-Prevention Assembly.
AWWA C550	Protective Interior Coatings for Valves and Hydrants.
SSPC-SP-2	Hand Tool Cleaning.
SSPC-SP-5	White Metal Blast Cleaning.

1.05 SUBMITTALS

A. **Shop Drawings:** Shop drawings of all valves and operators including associated wiring diagrams and electrical data, shall be furnished as specified in Section 01330, "Shop Drawings, Product Data and Samples".

B. **Valve Labeling:** The CONTRACTOR shall submit a schedule of valves to be labeled indicating in each case the valve location and the proposed wording for the label.

1.06 QUALITY ASSURANCE

A. **Valve Testing:** Unless otherwise specified, each valve body shall be tested under a test pressure equal to twice its design water-working pressure.

B. **Bronze Parts:** Unless otherwise specified, all interior bronze parts of valves shall conform to the requirements of ASTM B 62, or where not subject to dezincification, to ASTM B 584.

C. **Coatings:** All coatings in contact with potable water shall be certified to N.S.F. 61. A proof of design certification shall be provided upon request.

D. **Certification:** Prior to shipment, the CONTRACTOR shall submit for all valves over 12 inches in size, certified, notarized copies of the hydrostatic factory tests, showing compliance with the applicable standards of AWWA, ANSI, ASTM, NSF etc. and to these specifications.

PART 2 - PRODUCTS

2.01 VALVES, GENERAL

A. **General:** The CONTRACTOR shall furnish all valves, gates, valve-operating units, stem extensions, and other accessories as shown or specified. All valves and gates shall be new and of current manufacture. All shut-off valves, 6-inch and larger, shall have operators with position indicators. Where buried, these valves shall be provided with valve boxes and covers containing position indicators, and valve extensions. Shut-off valves mounted higher than 5 feet-6 inches above working level shall be provided with chain operators.

B. **Valve Flanges:** The flanges of valves shall be in accordance with Section 02510, "Water Distribution System", unless the valves are to be connected to an equipment with a flange with a different specification.

C. **Gate Valve Stems:** Where subject to dezincification, gate valve stems shall be of bronze conforming to ASTM B 62, containing not more than 5% of zinc nor more than 2% aluminum. Gate valve stems shall have a minimum tensile strength of 60,000 psi, a minimum yield strength of 40,000 psi, and an elongation of at least 10% in 2 inches, as determined by a test coupon poured from the same ladle from which the valve stems to be furnished are poured. Where dezincification is not a problem, bronze conforming to ASTM B 584 may be used.

D. **Protective Coating:** Except where otherwise specified, ferrous surfaces, exclusive of stainless steel surfaces, in the water passages of all valves 4-inch and larger, as well as the exterior surfaces of all submerged valves, shall be coated with 2 part thermal setting

epoxy coatings. Flange faces of valves shall not be epoxy coated. The valve manufacturer shall certify in writing that such coating has been applied and tested in the manufacturing plant prior to shipment, in accordance with these Specifications.

E. **Valve Operators:** Where shown, certain valves and gates shall be furnished with electric operators, provided by the valve or gate manufacturer. All operators of a given type shall be furnished by the same manufacturer. Where these operators are supplied by different manufacturers, the CONTRACTOR shall coordinate their selection to provide uniformity of each type of electric operator. All valve operators, regardless of type, shall be installed, adjusted, and tested by the valve manufacturer at the manufacturing plant.

F. **Valve Labeling:** Except when such requirement is waived by the ENGINEER in writing, a label shall be provided on all shut-off valves exclusive of hose bibbs and chlorine cylinder valves. The label shall be of 1/16-inch plastic or stainless steel, minimum 2 inches by 4 inches in size, and shall be permanently attached to the valve or on the wall adjacent to the valve as directed by the ENGINEER.

G. **Nuts and Bolts:** All nuts and bolts on valve flanges and supports shall be in accordance with manufacturer's recommendations. Where submerged or buried, all nuts and bolts on valve flanges and valve bodies shall be stainless steel.

2.02 GATE VALVES

A. All buried valves shall be of the inside screw, non-rising stem type. Valves shall be capable of being repacked under line pressure. Valves 14-inch and larger installed vertical pipes with their stems horizontal shall be fitted with bronze slides, tracks, rollers, and scrapers to assist the travel of the gate assembly. Quick opening valves shall have quick opening levers and cams in lieu of handwheel operators.

B. Gate Valves (3/4” to 3”):

1. Manufacturer or Equal:

a. Nibco T-133 and T-136

C. **Resilient-Seated Gate Valves:**

1. Resilient-seated gate valves with bi directional flow only conforming to ANSI/AWWA C509 shall be provided. Resilient-seated gate valves shall have cast iron bodies with flanged, bell, or mechanical joint ends, rubber-coated cast iron disc, flanged bonnet, bronze stem, O-ring seals, and operators with handwheel or square nut, unless otherwise shown. Maximum working pressure shall be 200 psi, tested at 400 psi.

2. **Manufacturer or Equal:**

a. Mueller

b. American Darling

c. Clow

2.03 BUTTERFLY VALVES (12” to 24”)-150 psi Rated

A. Butterfly valves shall be designed and manufactured in accordance with ANSI/AWWA Standard C504 latest revision for Rubber Seated Valves Class 150 B. The operating mechanism shall be designed so that the valve disc is held rigid when in any position. The valve shall be fitted with a 360 degree 18-8 stainless steel seat offset from the shaft and mechanically retained in the body or on the disc of the valve. Mechanical retention shall not be affected by the mating flange.

B. The valve disc or valve body shall be cast iron or ductile iron. The valve disc or valve body shall be fitted with a resilient seat of synthetic rubber retained with an 18 - 8 stainless steel clamp ring and stainless bolting. The resilient seat shall be designed with a cross section providing 360 degree mechanical retention against pulling out from between the retaining ring and disc. Retaining ring cap screws shall pass through the rubber seat.

C. The valve disc shall be rigidly attached to the shafts with keys to absolutely eliminate relative motion between the disc and shafting. The shaft keys shall be made of heat treated 410 or 416 stainless steel to prevent brinelling of the shaft keys in service. The keys shall be held in position with 18-8 stainless nuts.

D. Valve shafts shall be made from 18 - 8 stainless and shall be offset from the disc and body seats so that the shafting does not intersect the disc or body seats. Valve shafts 3" and smaller shall be one piece through shafts with factory set thruster to center the disc in the seat. Valve shafts larger than 3" shall be stub shafts, each rigidly keyed to the disc and provided with an adjustable thruster to move the disc and shaft assembly positively in either direction to center the disc in the seat of the valve. Shaft seal shall be designed for the use of standard split V type packing for standard O ring seals or for a pull down packing. Valve operators for valves 24" and smaller shall be traveling nut or worm gear type fully field adjustable stops so the operator does not have to be disassembled for valve seat adjustment. Valves larger than 24" shall be equipped with worm gear type operators per ANSI/AWWA Standard C504 latest revision.

E. Valves shall open left or counter clockwise. The operating mechanism shall be for buried service with a 2-inch square operating nut.

F. **Testing and Inspection**:

1. Performance Tests: Performance tests shall be performed on each valve in accordance with Section 5.2.1 Testing of ANSI/AWWA C504 or latest revision thereof.

2. Leakage Tests: Leakage tests shall be performed on each valve in accordance with Section 5.2.2 Testing of ANSI/AWWA C504 or latest revision thereof.

3. Hydrostatic Tests: Hydrostatic tests shall be performed on each valve in accordance with Section 5.2.3 Testing of ANSI/AWWA C504 or latest revision thereof.

4. Proof-of-Design Tests: Proof-of-Design tests shall be performed on each valve in accordance with Section 5.2.4 Testing of ANSI/AWWA C504 or latest revision thereof.

5. An Affidavit of Compliance certifying that all required tests have been performed shall be provided.

6. The Affidavit of Compliance and the records of all tests performed on the valves shall be kept and provided in a single hard cover bound notebook.

G. **Manufacturers or Equal:**

Manufacturer

Mueller

Henry Pratt

American Darling

Clow

2.04 ECCENTRIC PLUG VALVES

A. **Equipment Requirements:** Plug valves shall be on the non-lubricated, eccentric type with resilient faced plugs, port areas for valves 20 inches and smaller shall be at least 100% of full pipe area. Port area of valves 24 inches and larger shall be at least 70% of full pipe area. The body shall be of semi-steel (ASTM A-126 Class B) and shall have bolted bonnet which gives access to the intervals of the valve. Seats shall be welded overlay of high nickel content or a stainless steel plate locked in the body cavity. If a plate is used, it shall be replaceable through the bonnet access. Bearings shall be permanently lubricated of stainless steel, bronze or Teflon lined, fiber glass backed duralon. Bearing areas shall be isolated form the flow with grit seals. Valves shall have packing bonnets where the shaft protrudes from the grit seals. Valves shall have packing bonnets where the shaft protruded from the valve and the packing shall be self-adjusting chevron type which can be replaced without removing the bonnet. All nuts, bolts, springs and washers shall be stainless steel.

B. Valves shall be designed for a working pressure of 150 psi. The valve and actuator shall be capable of satisfactory operation in either direction of flow against pressure drops up

to and including 100 PSI (for plug valves over 12 inches in diameter). Valves shall be bubble tight in both directions at 100 psi differential.

Plug valves over 12" in diameter shall have worm gear operators. The operating mechanism shall be for buried service with a 2 inch square operating nut.

C. Plug valves are to be installed with the seat pointed towards the upstream flow, when specified.

D. **Manufacturers:**

1. PRATT

2. Clow

2.05 SWING FLEX CHECK VALVE

A. **General Requirements:** The check valve shall be of the Swing Flex, full body flanged type, with a top access cover and only one moving part, the valve disc.

B. **Body:** The valve body shall have 100% pipe flow area, with no restrictions at any point, through the valve. The Seating surface shall be on a 45 degree angle to minimize disc travel. The top access port shall be full size, allowing removal of the disc without removing the valve from the pipeline.

C. The access cover shall be domed in shape, to allow the disc to fully open should waste solids collect behind the disc. Cover shall be secured with stainless steel bolts.

D. The disc shall be of one piece construction, compression molded with an O-ring type sealing surface and contain steel and nylon reinforcements in both the pivot and a central disc area.

E. **Materials of Construction:**

1. Body - Cast Iron ASTM A126, Class B

2. Disc - Buna-N (NBR), ASTM D2000-BG

3. Bolts - 304 Stainless Steel

The exterior shall be coated with a red oxide primer.

F. **Manufacturers or Equal:**

1. Val-Matic (Swing Flex)

2. Mueller (Flexible Disc)

2.06 AIR-VACUUM AND AIR-RELEASE VALVES

A. **Air and Vacuum Valves:** Air and vacuum valves shall be capable of venting large quantities of air while pipelines are being filled, and allowing air to re-enter while pipelines are being drained. They shall be of the size shown, with flanged or screwed ends to match piping. Bodies shall be of high-strength cast iron. The float, seat, off-set piping, and all moving parts shall be constructed of Type 316 stainless steel. Seat washers and gaskets shall be of a material insuring water tightness with a minimum of maintenance. Valves shall be designed for minimum 150 psi water-working pressure, unless otherwise shown.

B. **Air-Release Valves:** Air-release valves shall vent accumulating air while system is in service and under pressure and be of the size shown and shall meet the same general requirements as specified for air and vacuum valves except that the vacuum feature will not be required. They shall be designed for a minimum water-working pressure of 150 psi, unless otherwise shown.

C. **Combination Air Valves:** Combination air valves shall combine the characteristics of air and vacuum valves and air release valves by exhausting accumulated air in systems under pressure and releasing or re-admitting large quantities of air while a system is being filled or drained, respectively. They shall have the same general requirements as specified for air and vacuum valves.

D. **Air Release Valve Manufacturer or Equal:**

   1. Val-Matic VM-48AS

E. **Air Vacuum Valve Manufacturer or Equal:**

   1. Val-Matic VM-301AS

F. **Combination Air Valve Manufacturer or Equal:**

   1. GA 959

2.07 CORPORATION STOPS

A. Unless otherwise shown, corporation stops shall be made of brass alloy for key operation, with screwed ends with corporation thread or iron pipe thread, as required. AWWA taper thread for inlet thread and compression type fittings for outlet.

B. **Corporation Stop Manufacturer or Equal:**

   1. Mueller P-25008N (1” and 2”)

   2. AY-McDonald 74701-22 (1” and 2”)

   3. Ford Meter FB1000-4-NL (1” and 2”)

4. Ford Meter FB1000-7-NL (2”)

PART 3 - EXECUTION

3.01 VALVE INSTALLATION

A. **General:** All valves, gates, operating units, stem extensions, valve boxes, and accessories shall be installed in accordance with the manufacturer's written instructions and as shown and specified. All gates shall be adequately braced to prevent warpage and bending under the intended use. Valves shall be firmly supported to avoid undue stresses on the pipe.

B. **Access:** All valves shall be installed to provide easy access for operation, removal, and maintenance and to avoid conflicts between valve operators and structural members or handrails.

C. **Valve Accessories:** Where combinations of valves, sensors, switches, and controls are specified, it shall be the responsibility of the CONTRACTOR to properly assemble and install these various items so that all systems are compatible and operating properly. The relationship between interrelated items shall be clearly noted on shop drawing submittals.

END OF SECTION 02502

SECTION 02510

WATER DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 SUMMARY

A. This Section includes water-distribution piping and related appurtenances in the municipal potable water system up to 5 feet outside the building limits for domestic and irrigation water service.

B. All work shall conform to the requirements of the local water authority, fire marshal, any other regulatory authorities having jurisdiction, or this specification, whichever is more stringent.

C. All water main installations shall comply with color coding requirements of Chapter 62.555.320, F.A.C.

1.03 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the WORK, as indicated on the drawings, as specified herein or both.

1.04 RELATED WORK

A. Section 02300 - Earthwork.

B. Section 02305 - Excavation and Backfilling for Utilities.

C. Section 02502 - Valves, General.

1.05 REFERENCE STANDARDS

A. Factory Mutual (FM)

1. Approval Guide

B. Underwriters Laboratories (UL)

1. Fire Protection Equipment Directory

2. UL 1285 - Pipe and Couplings, Polyvinyl Chloride (PVC), for Underground Fire Service

3. UL 262 - Gate Valves for Fire-Protection Service

4. UL 246 - Hydrants for Fire-Protection Service

C. National Sanitation Foundation (NSF)

1. NSF 14 - Plastics Piping System Components and Related Materials

2. NSF 61 - Drinking Water System Components - Health Effects

D. National Fire Protection Association (NFPA)

1. NFPA 70 - National Electrical Code

2. NFPA 24 - Hydraulic Fluid Power Systems - Methods to Improve Sealing Reliability (new standard)

3. NFPA 1963 - Screw Threads and Gaskets for Fire Hose Connections (latest revision of ANSI/NFPA 1963)

4. NFPA 13 - Installation of Sprinkler Systems (latest edition)

E. American Water Works Association (AWWA)

1. C151 Ductile-Iron Pipe, Centrifugally Cast, for Water (Latest revision of ANSI/AWWA C151/A21.51)

2. C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water

3. C150 - Thickness Design of Ductile-Iron Pipe

4. C110 - Ductile-Iron and Gray-Iron Fittings, 3 in through 48 in (75 mm through 1200 mm), for Water and Other Liquids

5. C153 - Ductile-Iron Compact Fittings, 3 in. through 24 in. (76 mm Through 610 mm) and 54 in. through 64 in. (1,400 mm Through 1,600 mm), for Water Service

6. C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 Inch through 12 Inch for Water Distribution

7. C500 - Gate Valves for Water and Sewage Systems

8. C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

9. C550 - Protective Epoxy Interior Coatings for Valves and Hydrants

10. C509 - Resilient-Seated Gate Valves for Water Supply Service

11. M44 - Distribution Valves: Selection, Installation, Field Testing, and Maintenance

12. C800 - Underground Service Line Valves and Fittings

13. C702 - Cold Water Meters - Compound Type

14. C502 - Hydrants, Dry Barrel Fire

15. M41 - Ductile Iron Pipe and Fittings

16. C600 - Installation of Ductile-Iron Water Mains and Their Appurtenance

17. C605 - Water Treatment - Underground Installation of Polyvinyl Chloride PVC Pressure Pipe and Fittings for Water

18. M23 - PVC Pipe: Design and Installation

19. M17 - Fire Hydrants: Installation, Field Testing, and Maintenance

20. C651 - Disinfecting Water Mains

F. American Society for Testing and Materials (ASTM)

1. B88 - Standard Specification for Seamless Copper Water Tube

2. B813 - Standard Specification for Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube

3. B32 - Standard Specification for Solder Metal

4. D2241 - Standard Specification for Poly Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)

5. D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

6. F645 - Standard Guide for Selection, Design, and Installation of Thermoplastic Water Pressure Piping Systems

G. American Society of Mechanical Engineers (ASME)

1. B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings R(1994)

2. B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings

H. Manufacturer’s Standardization Society (MSS)

1. SP-60 - Connecting Flange Joint Between Tapping Sleeves and Tapping Valves

I. Copper Development Association (CDA)

1. Copper Tube Handbook

1.06 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with requirements of the regulatory authorities having jurisdiction; including tapping of water mains, backflow prevention, installation, testing, and disinfection. Comply with standards of the regulatory authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.

B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

C. Electrical Components, Devices, and Accessories: UL listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to the regulatory authorities having jurisdiction, and marked for intended use.

D. Comply with FM's "Approval Guide" or UL's "Fire Protection Equipment Directory" for fire-service-main products.

E. NFPA Compliance: Comply with NFPA 13 and NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.

F. NSF Compliance: Comply with NSF 14 for plastic potable-water-service piping. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

G. Comply with requirements of Section 02305 – Excavation and Backfilling for Utilities.

1.07 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by OWNER or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify the OWNER not less than 2 days in advance of proposed utility interruptions; and,

2. Do not proceed with utility interruptions without written permission from the OWNER.

1.08 EXISTING UTILITIES

A. Furnish temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers, and other obstructions encountered in the progress of the work.

B. Where the grade or alignment of the pipe is obstructed by existing utility structure such as conduits, ducts, pipe branch connections to main sewers, or main drains, the obstruction shall be permanently supported, relocated, removed, or reconstructed by the CONTRACTOR in cooperation with the owners of such utility structures. No deviation shall be made from the required line or grade except as directed by the ENGINEER.

PART 2 - PRODUCTS

2.01 PIPE

A. All metallic pipe shall have bituminous outside coating conforming to:

Viscosity, KU at 25°	56-60
Dry set to touch	6 minutes
Dry hard	22 minutes

B. Ductile iron pipe shall conform to ANSI/AWWA C150/A21.50 and C151/A21.51 with class 52 pipe. Pipe shall be cement-lined and seal-coated in accordance with ANSI/AWWA C104/A21.3. Class 53 pipe shall be used for flanged applications. The pipe shall be adapted for use with class 350 fittings through 24" and for class 250 fittings in sizes 30" and over. Approved manufacturers: American, Clow, US Pipe, McWayne & Griffin.

1. Unless otherwise indicated, all ductile iron pipe shall be factory lined and coated.

a. Lining: All pipe shall be cement mortar lined in accordance with AWWA Standard C104.

b. Coating: Unless specified otherwise, all pipe shall be coal-tar enamel coated outside to a dry film thickness of at least 1 mil with Koppers Bitumastic Tank Solution, or equal.

c. Repair: Anywhere that the coating is removed purposely or accidentally, the area shall be cleaned of any rust, grease and dirt and recoated to a minimum dry film as specified for the individual piece.

C. Polyvinyl chloride pipe shall conform to ANSI/AWWA C900 (4” – 12”) and C905 (over 12”). Pipe shall be cement-lined and seal-coated in accordance; Polyethylene (PE) encased. Class 12454-A or Class 12454-B virgin material with a minimum wall thickness of DR Series 18 shall be used for PVC pressure pipe. Ultra violet degradation or sun

bleached pipe will be cause for rejection. Joints for PVC pressure pipe shall be bell and spigot push on rubber gasket type only. No solvent weld or threaded joints permitted.

D. Soft Copper Tubing, NPS 3 inches or smaller:

1. Tubing shall be manufactured in accordance with ASTM B88, Type K, annealed temper. Fittings shall be in accordance with ASME B16.18, for cast-copper-alloy, solder joint pressure fitting, or ASME B16.22 for wrought-copper, and copper-alloy, solder joint pressure fitting type. Soldering flux shall be in accordance with ASTM B813, water-flushable type. Solder filler metal shall be in accordance with ASTM B 32, lead-free type with 0.20% maximum lead content.

D. All materials used in the construction of potable water distribution/transmission system shall be in compliance with ANSI/NSF Standard 61 - Drinking Water System Components - Health Effects.

2.02 FITTINGS

A. The pressure rating shall be 350 PSI for fittings.

B. Fittings shall be cast iron or ductile iron, meeting the ANSI/AWWA Specification C-153/A21.53.

C. Fitting must be cement lined and seal coated per ANSI/AWWA C104/A21.3.

D. Flanged fittings shall conform to ANSI Specifications for Class 125.

E. Ductile iron fittings shall conform to ANSI/AWWA standard specification C110-A21.10 latest revision.

2.03 JOINTS

A. BELL AND SPIGOT CONNECTIONS:

1. Joints in bell and spigot pipe shall be push-on, mechanical, or restrained mechanical joints in accordance with ANSI/ANWA Standard C-111/21.11, latest revision.

B. FLANGED CONNECTIONS:

1. All flanged pipe barrels shall comply with the physical and chemical requirements as set forth in the Handbook of Ductile Iron Pipe of the Ductile Iron Pipe Research Association. Flanges shall be in accordance with ANSI Specification B16.1 for Class 125 flanges. Bolts shall comply with ANSI Specification B18.2.

2. Before starting fabrication of the cast iron pipe and fittings, complete detailed working drawings shall be submitted by the CONTRACTOR for approval by the ENGINEER. Such drawings shall show the piping layouts and contain schedules

of all pipe, fittings, valves, expansion joints, hangers and supports and other appurtenances. Where special fittings are required, they shall be shown in large detail with all necessary dimensions. The drawings submitted shall show flanged jointed sections placed so as to be removed without disturbance to the main pipe sections.

3. Flanged pipe shall be faced and drilled to the American Standard drilling, unless special drilling is called for or required. Where tap or stud bolts are required, flanges shall be tapped. Flanges shall be accurately faced and drilled smooth and true, at right angles to the pipe axis and shall be covered with zinc dust and tallow or a rust preventive compound immediately after facing and drilling.

4. Flanged pipe with screwed-on flanges shall be furnished with long hubs and the flanges shall be screwed on the threaded end of the pipe in the shop and the face of the flange and end of pipe refaced together. There shall be no leakage through the pipe threads and the flanges shall be designed to prevent corrosion of the threads from outside.

5. Flanged joints shall be made with bolts or stud bolts and nuts. Bolts, stud bolts, and nuts shall conform to American Standard heavy dimensions, semi-finished with square or hexagonal heads and cold punched hexagonal nuts, meeting the requirements of ASTM Designation A-307. Bolt sizes shall be American Standard for the flanges specified, and bolts and nuts shall have good, true threads.

C. RESTRAINTS:

1. Mechanical Joint Pipe shall be restrained and the following manufacturers or equal shall be used:

   Ebaa Iron-Mega Lug

   Star Pipe Products-Series 3000 (DIP)

   Star Pipe Products-Series 4000 (PVC)

   Tyler Union- TUF Grip

2. Bell Joint Pipe shall be restrained and the following manufacturers or equal shall be used:

   Star Pipe Products-Series 3100 (DIP)

   Star Pipe Products-Series 4100 (PVC 3”-12”)

   Star Pipe Products-Series 4400 (PVC 14”-36”)

2.04 HYDRANTS

A. Fire hydrants shall have a traffic breakaway-flange; no cut bolts; non-rising stem; dry barrel; 5 1/4" main valve opening; bronze to bronze seating. Pumper nozzle to be 18" min. and 24’ max. from finish grade. All hydrants to be installed with anchoring tee and control valve. Fire hydrant shall comply with ANSI/AWWA C502-05 (or latest revision). Hydrants shall be Mueller Super Centurion A-423 plugged drain or American Darling B-84-B-5.

B. Fire hydrants installed that have not been placed into service shall be covered with a burlap bag to indicate that they are out of service.

C. Fire hydrants shall have a top coat of tnemic series 66 yellow.

2.05 WATER TAPS

A. Tapping Existing Pipelines.

1. Tapping sleeves shall be Mueller H-615, Mueller H-616 or American Darling 2800C. Tapping valves shall be resilient wedge type and manufactured by Mueller, American Darling or CLOW. Tapping cross shall be Mueller H-715.

2. Cast iron tapping sleeve or tapping cross shall have mechanical joint connections. The flanged end for tapping valve shall include a recess to provide positive alignment of the tapping valve.

3. Tapping valves shall conform to AWWA C509 and C500 standards. An Affidavit of Compliance shall be furnished for the valves.

4. Tapping valves 16" and smaller shall be designed for operation in a vertical position with a vertical operating shaft. Tapping valves over 16" shall be designed for operation in a horizontal position and shall have a vertical operating shaft.

2.06 WATER SERVICES

A. Water services in the public R.O.W. shall be Endot EndoTrace polyethylene tubing with a minimum working pressure of 200 psi.

B. All water service tubing and fittings shall be in conformance with "City of Lake Worth - Minimum Design and Construction Standards".

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Unloading Material: The CONTRACTOR shall exercise care in unloading and handling pipe, valves, fittings, and all other material. Dropping pipe from trucks and allowing pipe to roll against other pipe will not be permitted.

B. Excavation: Pipe line trenches shall be excavated to required depth as shown on the drawings or as directed by the ENGINEER. In general, water distribution lines shall have a minimum of 36" cover for PVC pipe and 30" cover for DIP pipe. If rock is encountered, excavation shall be carried a minimum of 8" below bottom of pipe, and trench backfilled with sand or earth and thoroughly tamped. Width of trench shall be sufficient to allow workmen to perform all operations incidental to constructing the pipe line. Hand dug bell holes shall be provided to permit proper joint making. No section of pipe shall bear on rock or on placed blocking. All excavations will be dewatered to permit dry joints.

C. Work shall be properly braced where necessary. Where wood sheeting or certain designs of steel sheeting are used, the sheeting shall be cut off at a level two feet above the top of the installed pipe and that portion below that level shall be left in place. If interlocking steel sheeting of a design approved by the ENGINEER is used, it may be removed providing removal can be accomplished without disturbing the bedding or alignment of the pipe. Any damage to the pipe bedding, pipe or alignment of the constructed main caused by removal of sheeting shall be cause for rejection of the affected portion of the work.

3.02 PIPE

A. Installation of Pipe: All installation shall conform to AWWA C-600-10. Pipe shall not be rolled or pushed into the trench from the bank. Before pipe is lowered into the trench, it shall be thoroughly inspected by the CONTRACTOR, as necessary, to insure sound conditions and eliminate the possibility of leakage or bursting under test pressure.

B. Water mains shall be laid at least 10 feet horizontally (preferred) or 6 feet minimum from any existing or proposed sewer mains. Water main may be installed at least 3 feet horizontally from any existing or proposed sewer mains where the water main is installed 6 inches above the existing or proposed sewer main. A vertical distance of at least 12" must be maintained whenever a water main pipe crosses under a sewer main with the water main being ductile iron pipe with 20 foot lengths of pipe centering on the point of crossing. If a crossing where the sewer is laid above a water line is unavoidable, then the above mentioned precautions shall be observed regardless of the distance of vertical separation between water mains and sewer piping.

C. Pipes and valves, fittings, and all other materials showing defects shall not be used for construction. All such defective materials shall be removed from the construction site immediately. Before pipe is lowered into the trench, it shall be swabbed or brushed to insure that no dirt or foreign matter will be in the finished line.

D. Pipe shall be laid on a flat bottom trench and backfill tamped to 6" above the top of the pipe. Pipe installation shall conform to "Type B Method" as adopted by Committee A-21 of the American Standards Association. A firm even bearing shall be provided throughout the length of each section of pipe. Pipe shall not bear on any unyielding structures, nor shall it support any other structures. All dead ends shall be plugged or capped, anchored and held in place with restrained joints as required. Except while work is in progress, all pipe openings shall be suitably plugged to prevent entrance of water or any foreign matter. Material deemed unstable for providing adequate support for pipe shall be removed and replaced by suitable material. Adequate backfill shall be deposited on the pipe to prevent floating. Any pipe which has floated shall be removed from the trench and reinstalled as directed by the ENGINEER.

E. Joints: All joints shall be suitable for the type of pipe being jointed and shall be made in accordance with manufacturer's recommendations.

1. Mechanical joints: Mechanical joints shall be of the stuffing box type. The gland, followed by the rubber gasket, shall be placed over the plain end of the pipe which is inserted into the socket. The gasket is then pushed into position so that it is evenly seated in the socket. The gland shall be moved into position against the face of the socket, bolts inserted and made finger-tight. Bolts shall be tightened by a ratchet wrench suitable for the size of pipe being connected alternately, bottom, then top, etc., until the joint is completed.

2. Compression Pipe joints: Compression joints shall be a rubber seal joint, made pressure tight by a molded rubber gasket and lubricated to facilitate assembly. The joint shall be made tight by inserting the plan end into the bell after lubrication. Joints shall be made up as recommended by the manufacturer.

3. Flanged joints: Flanged joints shall be made with rubber gaskets. Bolts shall have rough square hands and hexagonal nuts and made to American Standard rough dimensions and shall be recommended size trimmed. Bolts shall be recommended size for the diameter of the pipe being jointed and shall be tightened as to distribute evenly the stress in the bolts and bring the pipe into alignment.

4. Threads shall be neatly cut with sharp tools and the jointing procedure shall conform with the best practices. Before jointing, all scale shall be reamed. All pipe shall be screwed with an application of graphite and engine oil or other approved pipe compound applied to the threads. This application shall be thoroughly wiped off the inside of every joint.

3.03 INSTALLATION OF FITTINGS

A. Applicable portions of these specifications shall apply to installation of fittings. Reaction of restrained joints shall be applied at bends and tees and where changes in pipe diameter occur at reducers or in fittings.

3.04 INSTALLATION OF FIRE HYDRANTS

A. All hydrants shall stand plumb and burial line shall be set at finished grade. The pumper nozzle shall be set at 18" min. and 24” max. above finished grade.

3.05 INSTALLATION OF VALVES

A. All valves shall stand plumb unless otherwise shown on the plans or directed by the ENGINEER. The operation of installing tapping sleeves and valves shall be done by an experienced organization who has been engaged in this type of work not less than one (1) year with a representative list of successful installations. All valves shall be tagged per City of Lake Worth.

3.06 PRESSURE TESTS

A. After pipe has been adequately backfilled, all laid pipes shall be subjected to hydro-static pressure of 150 PSI (200 PSI for firelines). The duration of the pressure test shall not be less than two (2) hours and shall not vary more than 5 PSI during the test. Test sections shall be limited to a maximum length of 2000 feet. Care shall be taken to insure that all air has been removed from the pipe previous to pressure tests. The CONTRACTOR shall provide such means of venting the pipe as are required. Any material or installation proving defective shall be replaced by the CONTRACTOR.

B. Pressure Tests should be conducted prior to disinfection of the water main.

C. Pressure test, disinfection and flushing shall be conducted in accordance with current AWWA standards (AWWA C651, 652, or 653).

D. Surface waters shall not be used to conduct the pressure test or filling of water mains.

3.07 LEAKAGE TEST

A. After the main has been brought up to test pressure, it shall be held at this pressure and make up water shall be carefully measured by use of displacement meter or by pumping water from a vessel of known volume. The pipe line shall be walked and all visible joints inspected for leakage and movement of pipe. All visible leaks shall be repaired. Should any section of pipe line disclose joint leakage greater than that permitted, the CONTRACTOR shall at their own expense, locate and repair the defective joints until leakage is within the permitted allowance.

B. The leakage test shall be conducted in accordance with AWWA Specification C-600, latest revision. Leakage shall be less than the number of gallons per hour as determined by the formula:

$$L = \frac{SD\,P^{1/2}}{148{,}000}$$

in which L equals the allowable leakage in gallons per hour, S is the pipe length in the main tested, D is the nominal diameter of the pipe in inches, and P is the average test pressure during the leakage test, in pounds per square inch, gauge. Length of test shall not be less than two (2) hours. Average test pressure shall not be less than 150 PSI. The test shall be conducted as directed by the ENGINEER.

3.08 DISINFECTION/STERILIZATION OF COMPLETE PIPELINE

A. Before the final acceptance of complete pipeline, all requirements of the County and Palm Beach County Public Health Department (PBCHD) shall be satisfied. Satisfactory bacteriological test results from the agencies shall be forwarded to the ENGINEER.

B. Prior to chlorination of mains, all dirt and foreign matter shall be removed by high velocity flushing through fire hydrants or other approved blow-offs. The main shall then be filled with a chlorine solution of at least 50 parts per million of chlorine and retained in the pipe not less than twenty-four (24) hours. Chlorine residual after retention period shall be not less than 30 parts per million. After chlorination, the mains shall be thoroughly flushed with potable water and required samples taken for bacteriological analysis. Sampling to be witnessed by the ENGINEER.

C. Pressure test, disinfection and flushing shall be conducted in accordance with current AWWA standards (AWWA C651, 652, or 653).

D. Sample taps on water mains or fire mains shall flow 24 hours/day during the bacteriological testing.

E. At the time of bacteriological sampling, chlorine residual determination shall be made to insure that chlorine concentration in the main is no higher than that generally in the system (3.0 mg/l free or 5.0 mg/l combined maximum), or less than 0.20 mg/l free or 0.60 mg/l combined. If total chlorine residual exceeds 4.0 mg/l the sample is considered invalid. Tests for chlorine residual must be performed using DPD Colormetric test. Use of “chlorine test strips” is no longer allowed.

F. Bacteriological samples must be analyzed in laboratory certified by the state Department of Health.

3.09 BACKFILL

A. No trenches or excavations shall be backfilled until the trench and installation has been inspected and written approval given by the ENGINEER. All backfill shall be carefully

placed to avoid movement of the pipeline. Backfill shall be free from rock, stones larger than 2" in any dimension, brush, or other unsuitable material as determined by the Engineer. It shall be placed in the trench uniformly on both sides of the pipe for full width of the trench and to the horizontal diameter of the full length of the pipe. This backfill shall be thoroughly tamped to provide support free from voids.

B. Additional backfill shall then be placed between joints to an average depth of 12" over the top of the pipe where pipe is of 8" and smaller diameter, and 24" over larger pipe. Pipe joints shall remain exposed until completion of the pressure and leakage tests unless otherwise directed by the ENGINEER.

C. On completion of pressure and leakage tests, the exposed joints shall be backfilled to a depth of 12" above the top of the pipe. Backfill shall be carefully compacted until 12" of cover exists over the pipe. The remainder of the backfill shall then be placed and compacted thoroughly by puddling and tamping as required. Where directed, puddling and tamping may be omitted, and backfill shall be neatly rounded over the trench to a sufficient height to allow for settlement to grade after consolidation.

3.10 RESTORATION OF SURFACE AND/OR STRUCTURES

A. The CONTRACTOR shall restore and/or replace paving, curbing, sidewalks, fences, sod, survey points and other disturbed surfaces to a condition equal to that before the work was begun and to satisfaction of the ENGINEER, and shall furnish all labor and materials incidental thereto. Relative restoration of surfaces and/or structures, the CONTRACTOR shall comply with all governing agencies requirements including city, town, county and state.

3.11 CONNECTION TO EXISTING SYSTEM

A. The CONTRACTOR shall make proper arrangements for compliance with the regulations for connection to any existing distribution system with the OWNER of that system. Tap-in and connection will be made in strict accordance with the ENGINEER.

END OF SECTION 02510

SECTION 02515

WATER SERVICE CONNECTIONS AND TRANSFERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 WORK INCLUDED

A. This section covers the work necessary for service connections, laying service pipe, casing pipe, making connections to the new water main and to the existing service pipe, testing and flushing, and all incidental work necessary to accomplish the construction.

B. The work includes excavation, backfill and compaction, furnishing and installing service clamps, corporation stops or valves, meter yokes or connections, service connection piping, fittings, and appurtenances within the designated limits, testing, flushing, and other incidental work as required for a complete installation

C. The approximate location of service connections to be installed or transferred will be determined by the CONTRACTOR.

1.03 RELATED WORK

A. Division 2 as applicable

B. Section 02300 - Earthwork.

C. Section 02305 - Excavation and Backfilling for Utilities.

D. Section 02502 - Valves, General.

E. Section 02510 - Water Distribution System.

PART 2 - PRODUCTS

2.01 EXCAVATION

A. Excavation shall conform to the requirements of Section 02305, Excavation and Backfilling for Utilities.

2.02 BACKFILL

A. Acceptable material excavated from the trench shall be used for trench backfill. Select backfill material for use in the pipe zone, when required by the ENGINEER, shall contain no material larger than one (1) inch in diameter.

2.03 SERVICE CONNECTION SIZE

A. The location and size of service connection to be transferred or installed will be as determined in the field by CONTRACTOR. The meter and meter box will be installed by CONTRACTOR. Minimum tap size shall be one (1) inch.

2.04 SERVICE SADDLES

A. Service saddles shall have CC threads with ductile iron body and stainless steel double-strap saddles or equal. Saddle shall be of the size required by the pipe and shall be provided with a neoprene O-ring seal and appropriately sized IP tap. All service saddles shall conform to ANSI/AWWA C111/A21.11 and ASTM A-588.

B. Double Strap Service Saddles shall be the following:

¾”, 1”, 1 ¼”, 1 ½”, and 2”: JCM 402 or JCM 404 (preferred)

1” – 2 inch: JCM 313 and Ford Meter 202B

¾”, 1”, 1 ½”, and 2”: Ford Meter F202 and Ford Meter FCD202

C. Double Strap Tapping Saddles shall be the following:

¾”, 1”, 1 ¼”, 1 ½”, and 2”: McDonald 3826

1” – 2 inch: JCM 313 and Ford Meter 202B

¾”, 1”, 1 ½”, and 2”: Ford Meter F202 and Ford Meter FCD202

2.05 TAPPING MATERIALS

A. The CONTRACTOR shall provide the necessary tapping machines for making the connections, and shall furnish the miscellaneous materials required for making the taps, such as cutting oil and similar materials.

2.06 CORPORATION STOPS

A. Corporation stops for one (1) inch services shall have AWWA thread inlet and a compressive connection outlet suitable for service pipe. Corporation stops for two (2) inch services shall be ball valves and have outside iron thread inlet and a compression connection outlet suitable for service pipe. Corporation stops shall meet AWWA C800, latest revision.

B. Corporation Stops shall be the following:

1 inch: Mueller P-25008N, AY- McDonald 74701-22, Ford Meter FB1000-4-NL

2 inch: Mueller P-25008N, AY- McDonald 74701-22, Ford Meter FB1000-7-NL

2.07 METER COUPLINGS

A. Couplings shall be hose clamp type coupling, outside IP thread to plastic for connecting polyethylene pipe to corporation stop and meter yoke. Clamp pipe with two stainless steel clamps at each connection.

B. Coupling Manufacturers or Equal:

5/8” x 3/4” x 3/4”;

1. Mueller H-10890

3/4” x 3/4” x 2 ½”:

1. AY-McDonald 74662
2. Ford Meter C38-23-25-NL

1”:

1. Mueller H-10890

1” x 1” X 2.63”:

1. AY-McDonald 74662
2. Ford Meter C38-24-35-NL

2.08 MISCELLANEOUS SERVICE FITTINGS

A. Miscellaneous fittings (3/4” to 2”), includes reducers and adapters.

B. Miscellaneous Service Fittings Manufacturers or equal:

1. Mueller Company (P-15428N, P-15451, P-15403N)
2. AY-McDonald (74753-22, 74754-22, 74758-22)
3. Ford Meter (C84-XX-NL, C14-XX-NL, C44-XX-NL)

2.09 CURB STOPS

A. Curb stops shall meet AWWA C800, latest revision.

B. 1” Angle Meter Valve Curb Stop or equal:

5/8” x 3/4” x 1” and 1”

1. Mueller P-14258N

1” x 3/4” x 3/4” and 1”:

1. AY-McDonald 74602B
2. Ford Meter BA13-342W-Q-NL
3. Ford Meter BA13-444W-Q-NL

C. 2” Angle Meter Valve Curb Stop or equal:

2”:

1. Mueller P-24276N

2” Flanged:

1. AY McDonald 74602B-22
2. Ford Meter BFA43777W-NL

D. 1” Straight Meter Valve Curb Stop or equal:

5/8” x 3/4” x 1” and 1”

1. Mueller P-24350N

1” x 3/4” x 3/4” and 1”:

1. AY-McDonald 74100M-22
2. Ford Meter B43-342W-NL
3. Ford Meter B43-444W-NL

2.10 <u>ANGLE METER VALVE (FOR U BRANCH)</u>

A. 1” Angle Meter Valve Curb Stop or equal:

5/8” x 3/4” x 3/4”:

1. Mueller P-14265N

3/4”:

1. AY-McDonald 74604B

2.11 DUAL WATER SERVICE U BRANCH

A. 1” Angle Meter Valve Curb Stop or equal:

1” x 3/4” x 6.5”:

1. Mueller P-15363N
2. AY-McDonald 708U2M and 708UFM
3. Ford Meter U48-43-65-NL and U18-43-65-NL

2.12 METERS, BOXES, AND COVERS

A. Meters are provided by the CITY. Boxes and Covers are to be furnished by the CONTRACTOR. CONTRACTOR will install Meters, Boxes and Covers.

B. Meter boxes shall be the following:

¾” to 1” meters: Oldcastle Christy B12 with Nicor Inc. Read-Rite Polymer B12 lid, HDR version and antifloat.

1 ½” to 2” meters: Oldcastle precast N36 box w/ B36E lid

2.13 METER FLANGE

A. Meter Flanges shall be the following:

2” only: McDonald 610F and Ford Meter CF31-77-NL

2.14 COPPER TUBING

A. Copper tubing used for one (1) inch service connections shall be Type K with compression fittings, soft, seamless, conforming to ASTM B88, with commercially pure wrought copper solder joint fittings. Make joints with 95-5 coreless wire solder, ASTM B32, Grade 95 TA.

2.15 WATER SERVICE PIPING

A. Water service piping shall be Endot EndoTrace Polyethylene (3408) tubing (blue in color), 200 psi rated, and conform to AWWA 901-08 with a SDR of 9. Pipe joints shall be of the compression type totally confined grip seal and coupling nut.

2.16 CASING PIPE

A. Casing pipe shall be Schedule 40 PVC., or equal, as determined by ENGINEER.

PART 3 - EXECUTION

3.01 TRENCH EXCAVATION AND BACKFILL

A. Conform to the requirements of Section 02305, Excavation and Backfilling for Utilities. Place only select backfill material in the trench within 6 inches of the service connection pipe or line. Cover around pipe shall be 8 inches or as indicated on the plans. Backfill and compact remainder of trench with excavated material as specified in the referenced section.

3.02 CONNECTION TO MAIN

A. Clean exterior of main of dirt or other foreign matter that may impair the quality of the completed connection. Then place service clamp at the desired location and clamp tight by tightening alternate nuts progressively. Do not place service clamp within 1 foot of pipe joint or other clamp.

B. Taps shall be made in the pipe by experienced workmen using tools in good repair with the proper adapters for the size main being tapped.

3.03 PREPARATION OF TRENCH

A. Grade the bottom of the trench by hand to the line and grade to which the pipe is to be laid, with proper allowance for special bedding. All other conditions and operations as specified in Section 02305, Excavation and Backfilling for Utilities must be adhered to. The trench bottom shall form a continuous and uniform bearing support for the pipe. A 6 inch layer of imported earth or other specified material will be required over and under pipe in areas where suitable trench side material is not available.

3.04 UNDERCROSSING OF ASPHALT-SURFACED ROADS

A. Service connection piping under asphalt-surfaced roads shall be bored or jacked. Open cutting of asphalt-surfaced roads is not permitted except at the direction of the ENGINEER. The service connection pipe shall be installed so that it has a minimum cover of 30” with a slight grade sloping away from the water main.

3.05 COPPER TUBING

A. The copper tubing shall be cut with square ends, reamed, and flared with the proper size flaring tool, cleaned, and made up tightly. Care shall be taken to prevent the tubing from kinking or buckling on short-radius bends. Kinked or buckled sections of copper tubing shall be cut out and the tubing spliced with the proper brass fitting at the CONTRACTOR's sole expense.

3.06 POLYETHYLENE PLASTIC TUBING

A. Install polyethylene plastic tubing in accordance with the manufacturer's recommendations.

3.07 INSTALLATION OF METER BOXES AND METERS

A. Meters and meter boxes or vaults shall be installed by the CONTRACTOR as shown on the plans. Finish grade of completed meter enclosure shall be flush with existing ground or as shown otherwise. Meter boxes or vaults shall be set or constructed plumb with the top set to conform to the slope of the finish grade. Lightly compacted earth backfill shall be placed inside of the meter boxes to depth indicated. Grade adjustment of the meter boxes or vaults shall be by using standard extension sections for the box or vault specified. Install meter in a horizontal position with the meter dial or dials at a depth below the cover as shown on the plans. Backfill around meter vaults as specified for adjoining pipe.

B. Water meters shall be reinstalled by the CONTRACTOR where water meters are designated for relocation. Corporation stops shall be in the open position and angle stops shall be closed, prior to reinstallation of the meter.

C. Withhold reinstalling meters until the new water system is ready for operation. The remainder of the service connection, excluding the meter, may be installed at any time during or after construction of the main.

D. Where existing meters are designated for relocation, contractor shall read, record, and submit existing meter readings on the form supplied by the county prior to removal of meters, and after completion of relocation work. CONTRACTOR shall furnish ENGINEER and county with copies of all meter readings on a monthly basis or as requested by the ENGINEER.

3.08 HYDROSTATIC TEST AND LEAKAGE

A. Test service connections and service connection tubing by either testing in conjunction with the main at the test pressure required for the main, or by testing at the normal hydrostatic main pressure after the main has been completely installed and tested. Inspect visually for leaks and repair any leaks before backfilling. Duration of the test shall be at least fifteen (15) minutes.

3.09 DISINFECTION

A. Service connection transfers shall be disinfected as follows:

1. Make connection to the main pipeline which shall have been previously hydrostatically tested and disinfected.

2. Prior to connecting new copper or plastic tubing to existing copper tubing or meter stop, flush new copper or plastic tubing by fully opening corporation stop and allowing water to run for 2 minutes.

3. Close corporation stop and meter stop, connect new copper or plastic tubing to existing copper tubing or to meter stop, as applicable. Open corporation stop and allow to stand for a minimum of 30 minutes retention period. Open meter stop.

B. The CITY may put extra chlorine in the water system during the time of service connection

transfers to provide sufficient chlorine residual to adequately disinfect service connections when the above procedure is followed.

END OF SECTION 02515

SECTION 02530

SANITARY SEWERAGE SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the WORK under this Section.

1.02 SUMMARY

A. This section includes sanitary sewer piping and related appurtenances from connection to main to within 5 feet of outside the building limits.

B. All WORK shall conform to the requirements of the local sewer authority and any other regulatory authorities having jurisdiction, or this specification, whichever is more stringent.

1.03 WORK INCLUDED

A. The WORK under this Section shall consist of furnishing and installing sewer pipes and service connections as indicated on the plans and in accordance with these Specifications.

1.04 RELATED WORK

A. Section 02305 - Excavation and Backfilling for Utilities.

B. Section 02502 - Valve - General.

C. Section 02510 - Water Distribution System.

D. Section 02535 - Structures and Maintenance Access Structures.

1.05 DEFINITIONS

A. Maintenance access structures shall be designated as M.A.S., M.H., maintenance access structures or maintenance holes.

1.06 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe

2. D3034 - Standard Specification for Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings

3. F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

4. F679 - Standard Specification for Poly Vinyl Chloride (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings

5. C476 - Standard Specification for Grout for Masonry

6. C443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets

7. C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals

8. D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

9. C478 - Standard Specifications for Precast Reinforced Concrete Manhole Sections

10. C969 - Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.

B. American Society of Sanitary Engineers (ASSE)

C. American National Standards Institute (ANSI)

D. American Concrete Institute (ACI)

1. 318 - Building Code Requirements for Structural Plain Concrete

E. National Sanitation Foundation (NSF)

F. American Water Works Association (AWWA)

1. C110 - Ductile-Iron and Gray-Iron Fittings, 3 in through 48 in (75 mm through 1200 mm), for Water and Other Liquids (revision of ANSI/AWWA C110/A21.10-93)

2. C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings C153 - Ductile-Iron Compact Fittings, 3 in. through 24 in. (76 mm Through 610 mm) and 54 in. through 64 in. (1,400 mm Through 1,600 mm), for Water Service (revision of ANSI/AWWA C153/A21.53-94)

3. C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances revision of ANSI/AWWA C600-93)

4. C150 - ANSI Standard for Thickness Design of Ductile Iron Pipe

5. C151 - ANSI Standard for Ductile Iron Pipe

6. C153 - ANSI Standard for Ductile Iron Pipe Compact Fittings

G. Federal Specifications

1. SS-S-00210 - Sealing Compound Preformed Plastic for Pipe Joints

H. Uni-Bell PVC Pipe Association

1. UNI-B-6 - Low-Pressure Air Testing of Installed Sewer Pipe

1.07 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.

B. Force-Main Pressure Ratings: At least equal to system operating pressure, but not less than 150 psig.

1.08 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with requirements of the regulatory authorities having jurisdiction; including tapping of sewer mains, installation, and testing.

B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

C. Comply with requirements of Section 02305, Excavation and Backfilling for Utilities.

1.09 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by OWNER or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify the OWNER not less than two days in advance of proposed utility interruptions; and,

2. Do not proceed with utility interruptions without written permission from the OWNER.

1.10 COORDINATION & FEES

A. CONTRACTOR shall be responsible for obtaining and payment of all tap and construction permit fees associated with this section.

B. CONTRACTOR shall install all sewer lines and appurtenances as shown on the Drawings to within 5 feet of building limits. This shall include any taps, pumps, tanks, etc. If CONTRACTOR's WORK terminates at a connection point where WORK by others is complete, CONTRACTOR shall make the connection. If future connections will be required by others, CONTRACTOR shall install plugging and marking apparatus as necessary to protect, identify and locate their WORK.

PART 2 - PRODUCTS

2.01 PIPE

A. PVC plastic pipe and fittings for gravity sanitary sewers shall be unplasticized, PVC Plastic Gravity Sewer Pipe conforming to ASTM D 3034 with SDR 26 and integral wall bell and spigot joints for conveyance of domestic sewage. Sewer pipe, including laterals and fittings shall be of the same material composed of PVC plastic having a cell classification of 12454B or 12454C as defined in ASTM D 1784. Rubber sealing rings for pipe joints shall meet the requirements of ASTM D 1869. No solvent welded pipe will be permitted.

1. In addition to the above requirements, pipe shall also conform to the following tests:

a. Drop Impact Test in accordance with ASTM D 2444.

b. Pipe Stiffness Test in accordance with ASTM D 2412.

c. Acetone Immersion Test in accordance with ASTM D 2152.

B. PVC plastic gravity sewer pipe shall be as manufactured by J.M. Eagle, Vanguard or approved equal. Prior to delivery of PVC plastic pipe to the jobsite, CONTRACTOR shall furnish the ENGINEER complete data from the manufacturer of the type of PVC pipe and fittings they propose to install.

D. PVC C-900, 4" through 12" shall conform to ANSI / AWWA Standard C900-07 or latest revision, PVC pressure pipe shall be made from Class 12454-A or Class 12454-B virgin material and conform with a minimum wall thickness of or Series 18, ultra violet degradation or sun bleached pipe will be cause for rejection.

C. Ductile iron pipe shall be coated with Protecto 401 (40 mils) and conform to ANSI/AWWA standard C151/A21.51 and C150/A21.50.

1. DIP gravity main piping shall be Class 50 for pipes over 6”.

2. DIP gravity main piping shall be manufactured by American, Clow, US Pipe, McWayne, and Griffin.

2.02 FORCE MAIN

A. Pipe Material

1. PVC plastic pipe and fittings for sanitary force main be Schedule 80 PVC.

2.03 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, 4,000 psi

2.04 CLEANOUTS

A. Cleanouts shall be provided on sewer service laterals at no more than 75' on centers. Exterior cleanout box shall be US Foundry No. 7621 reversible handhole and cover and shall be marked “S”. Each cleanout box shall be level with adjacent grade and provided with 30 inches by 30 inches square, 8 inch thick concrete apron.

PART 3 - EXECUTION

3.01 GRAVITY SEWER INSTALLATION

A. All sewer pipes shall be true to line and grade with bells up grade. The sections of the pipe shall be so laid and fitted together that when complete, the sewer shall have a smooth and uniform invert. The pipe shall be maintained clean. All pipe shall be free from defects. Trenches shall be kept dry while the pipe is being laid.

B. Bedding of the pipe shall consist of ASTM C33 #67 rock requiring the bottom of the trench to be shaped to fit the bottom of the pipe for distance equal to one-half of the outside diameter of the pipe. Bell holes shall be deep enough to insure proper bearing of the pipe barrel on the bedding.

C. All joints shall be carefully fitted so as to ensure a tight waterproof joint. Joints shall not be covered until approved by the ENGINEER. The exposed end of all pipe shall be protected so as to prevent dirt or other debris from entering the pipe. Pipes shall be thoroughly flushed at the completion of the WORK.

D. Identification: Materials and their installation are specified in Section 02300 - Earthwork. Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.

   1. Use warning tape or detectable warning tape over ferrous piping; and,

   2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

E. Piping Applications: Include watertight joints.

F. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

G. Use maintenance access structures for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.

H. Install gravity-flow piping to within 5 feet of the building, at the building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.

I. Install piping at slope shown on the Drawings. If no slope is shown, minimum slope shall be 1% for 6 inch diameter pipes and 0.4% for 8 inch diameter pipes.

J. Install piping with 36 inch minimum cover, unless otherwise noted.

K. Pipe Joint Construction and Installation: Join and install pipe and fittings according to installations indicated.

1. PVC Sewer Pipe and Fittings: Install according to ASTM D 2321; and,

2. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.

L. Maintenance Access Structures Installation: Install complete with appurtenances and accessories indicated.

1. Form continuous concrete channels and benches between inlets and outlet; and,

2. Set tops of frames and covers flush with finished surface of Maintenance Access Structures that occur in pavements.

M. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

N. Clear interior of piping and structures of dirt and superfluous material as WORK progresses.

1. Place plug in end of incomplete piping at end of day and when WORK stops; and,

2. Flush piping between Maintenance Access Structures and other structures to remove collected debris.

3.02 SERVICE LATERAL CONNECTIONS

A. All connections which are for future use shall be properly capped. No pipe shall be cut for connections unless approved by the ENGINEER. Wyes for service connections shall be installed as shown on the plans or as directed by the ENGINEER to align with existing septic tank locations or existing laterals. The upper end of service connections shall be laid at a depth not less than 36 inches or more than 48 inches below finish grade elevation, unless otherwise noted on the plans.

3.03 FORCE MAIN INSTALLATION

A. Installation shall be in strict accordance with the manufacturer's instructions and recommendations in the locations shown on the Drawings.

B. Pipe handling. All loading or unloading of pipe, fittings, valves and accessories shall be done in such a manner so as to avoid damage. The pipe shall not be skidded or rolled against pipe already unloaded.

C. Force mains shall be constructed of Schedule 80 PVC as specified on the Plans. Fittings 4 inches and over shall be properly anchored and braced with restrained joints conforming to the details shown in the plans.

D. Force main piping shall be laid at continuously ascending or descending grades with restrained joint fittings, concrete encasement and appurtenances shown on the plans or required by these Specifications.

E. Air release valves shall be installed at all summits in the pipe where air can collect, as shown on the plans or as directed by the ENGINEER. The CONTRACTOR shall provide a record of elevations along the entire length of force main laid in the trench.

F. The interior of all pipe, fittings and other appurtenances shall be kept free of dirt and foreign matter at all times. Pipe shall be flushed clean before valves and other appurtenances are installed.

G. Pipe laying. All pipe shall be laid to line and grade with valves stems plumb. All pipe shall have a minimum cover of 36 inches for PVC pipe.

H. All fittings, encasement and appurtenances shall be incidental to the cost of furnishing and installing the force mains, unless separate payment for such items is provided in the Bid Schedule.

I. The force main shall be flushed full bore with clean water to remove any trapped air, silt, dirt and debris before testing. No cross-connection from any potable water system will be permitted.

3.04 TESTS

A. Gravity Sanitary Sewers (Non-Live systems):

1. After the joints have been inspected and approved, backfilling may be done until backfill is one foot over the pipes. Backfilling shall be in accordance with Section 02305 - Excavation and Backfilling for Utilities of these Specifications.

2. After backfilling gravity sewers to the aforesaid level, the ENGINEER and a representative of the OWNER will "lamp" the lines between maintenance access structures. If this alignment is true and no pipes are broken or misaligned, the backfilling shall be completed.

3. Tests for watertightness of gravity sewers shall be made by the CONTRACTOR in the presence of the ENGINEER. The sewer and connections shall not leak under the normal exterior ground water pressure at a rate in excess of 100 gallons per inch of diameter per mile per 24 hours for any section of line up to 15 inches in diameter. Special consideration shall be given to leakage allowance for sizes

larger than 15 inches in diameter. Exfiltration from individual maintenance access structures shall not exceed 4 gallons in 24 hours. A maximum run of three maintenance access structures may be used per test.

4. Where the crown of the pipe is below the natural ground water table at the time and place of testing, the pipe shall be tested for infiltration. Suitable watertight plugs shall be installed and sections of pipe to be tested shall be pumped dry before start of the test. Where the crown of the pipe is above the natural water table, the pipe shall be tested for exfiltration by installing necessary plugs and filling pipes and maintenance access structures with water and maintaining a static head of water of two feet above the crown of the pipe during the test. Exfiltration tests shall be conducted on gravity lines, building and house lateral lines to the property line. With sanitary sewers, the water level or internal pressure to be used for exfiltration tests shall be determined by the ENGINEER.

5. All visible leaks, regardless of results of infiltration tests, shall be repaired. All repairs shown necessary by the tests are to be made, broken or cracked pipe replaced, all deposits removed, the sewer left true to line and grade and entirely clean, free from lumps of cement, protruding gaskets, bulkheads, etc., and ready for use before final acceptance is made.

6. A video inspection of the sanitary sewer main lines will be performed by the CONTRACTOR after the first lift of rock is placed and compacted. The sanitary sewer lines shall meet City of Lake Worth criteria for allowable deflection.

7. Repair of any defects found in the system are to be completed at the expense of the CONTRACTOR.

8. On sanitary sewers, final infiltration and exfiltration tests shall be made by the CONTRACTOR at their expense after all backfilling operations completed and the sewers are cleaned and ready for use.

9. The ENGINEER shall maintain a record showing date and time of inspection, calculation of allowable exfiltration or infiltration and amount of measured exfiltration or infiltration.

B. Gravity Sanitary Sewers (Live systems):

1. Existing service laterals shall be connected to the newly constructed sewer sanitary gravity lines immediately following disconnection. Until the existing service laterals are connected to the new system, the untreated sewage shall be treated/handled in an approved manner.

2. After the joints have been inspected by the ENGINEER or the OWNER and approved, backfilling may be done until backfill is one foot over the pipes. Backfilling shall be in accordance with Section 02305 - Excavation and Backfilling for Utilities of these Specifications.

3. After backfilling gravity sewers to the aforesaid level, the ENGINEER and a representative of the OWNER will "lamp" the lines between maintenance access structures. If this alignment is true and no pipes are broken or misaligned, the backfilling shall be completed.

4. Tests for water tightness of gravity sewers shall be made by the CONTRACTOR in the presence of the ENGINEER. The sewer and connections shall be tested per the City of Lake Worth Public Services Department & Utility Department "Minimum Standards" requirements. Air Testing. The test shall comprise of all main line and lateral connections. Lateral connections shall be tested from the main line to the property line. The main lines and laterals shall utilize inflatable stoppers or approved plugs capable of withstanding the pressures of the test to isolate the main line section as well as the laterals to the property line.

5. Where the crown of the pipe is below the natural ground water table at the time and place of testing, the pipe shall be tested for infiltration. Suitable watertight plugs shall be installed and sections of pipe to be tested shall be pumped dry before start of the test. Where the crown of the pipe is above the natural water table, the pipe shall be tested for water tightness by the use of a low pressure air test per the City of Lake Worth Public Services Department & Utility Department "Minimum Standards" requirements. Air Testing. Air tests shall be conducted on gravity lines, building and house lateral lines.

6. All visible leaks, regardless of results of infiltration tests, shall be repaired. All repairs shown necessary by the tests are to be made, broken or cracked pipe replaced, all deposits removed, the sewer left true to line and grade and entirely clean, free from lumps of cement, protruding gaskets, bulkheads, etc., and ready for use before final acceptance is made.

7. A video inspection of the gravity sanitary sewer main lines will be performed by the CONTRACTOR after the first lift of rock is placed and compacted. The gravity sanitary sewer lines shall meet WWS and City of Lake Worth criteria for allowable deflection.

8. The CONTRACTOR may video tape the sanitary sewer laterals from the main line to the property line in lieu of air testing or exfiltration testing the lateral after backfilling. This may be done only if requested by the CONTRACTOR in writing and approved by the ENGINEER and CITY. The costs of any video inspection of laterals and repairs required of the lateral shall be the sole responsibility of the CONTRACTOR. All video taping of laterals shall include the property address for identification purposes.

9. The video inspection of the sanitary sewer gravity lines, laterals and joints will be reviewed by the ENGINEER and CITY and all joints for tightness and abnormalities. If the ENGINEER or CITY determines a possible defect exists, excavation, inspection and repair of any defects found in the system are to be completed at the expense of the CONTRACTOR.

10. The ENGINEER shall maintain a record showing date and time of inspection, calculation of allowable air loss or infiltration and amount of measured air loss or infiltration.

11. If the CONTRACTOR disputes any such claims of defect, it shall be the CONTRACTOR'S responsibility and expense to exfiltration test and or air test the line as to assure the integrity of the sanitary sewer gravity line, lateral or joint. The testing shall be arranged and coordinated to minimize any interruption to existing customers previously placed in service.

C. Force Mains:

1. Force mains shall be filled with clear water, flushed to evacuate trapped air, then pumped to a pressure of 150 psi and all visible leaks stopped by approved methods. A leakage test shall then be conducted at the above mentioned pressure and no installation will be acceptable until the leakage is less than the number of gallons per hour as determined by the formula:

$$L = \frac{SD\,P^{1/2}}{148{,}000}$$

In which L equals the allowable leakage in gallons per hour; S is the pipe length in the force main tested; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test in pounds per square inch gauge. The test shall be maintained for two hours. Water supplied to the force main during the test to maintain the required pressure shall be measured by a 5/8-inch meter installed on the discharge side of the test pump, or by pumping from a calibrated container.

2. Pipe lines shall be tested before backfilling all joints except where otherwise required by necessity, local ordinance or public convenience. All visible leaks at exposed joints and all leaks evident at the surface where joints are covered shall be made tight, regardless of total leakage as shown by the test. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are met. Defective materials, pipes, valve, and accessories shall be removed and replaced.

3. The CONTRACTOR shall maintain a record of pipe tested indicating date, time of test, test pressure variations, calculation of allowable leakage and amount of measured leakage.

3.05 SEWER-BY-PASS PUMPING AND FLOW CONTROL

A. The CONTRACTOR shall submit with the Schedule complete and detailed plans describing the CONTRACTOR's proposed method for manning and maintaining the flow control/by-pass pumping management 24-hours a day where and when necessary. The CONTRACTOR shall provide all necessary labor, pumps, piping and other equipment

necessary to accomplish this task. By-pass or any other type of pump discharge shall be discharged into a working maintenance access structure or appropriate tank or tanker vehicle. The CONTRACTOR will be responsible for any fines or clean-up expenses incurred for any unlawful or improper discharge or spill. The CONTRACTOR shall keep adequate quantities of chemicals and equipment on site to handle emergency situations including sewage spills.

3.06 WARRANTY

A. Any repairs or replacement necessitated by mechanical failure due to faulty materials, improper installation or poor workmanship shall be completed within five (5) days after notification by the ENGINEER. At the expiration of this time, the OWNER shall be entitled to have WORK done by others at the expense of the CONTRACTOR. Such repair WORK done by others shall not void the warranty nor the responsibility of the CONTRACTOR as to balance of the installation by the CONTRACTOR.

END OF SECTION 02530

SECTION 02532

PRE-FABRICATED SANITARY SEWER PUMP STATIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 WORK INCLUDED

A. The CONTRACTOR shall install and place in operation submersible sewage pumps supplied by the CONTRACTOR as indicated on the drawings and specified herein. Control panel, pump shoes, guide rails (or bars), brackets and all other equipment shall be supplied and installed by the CONTRACTOR.

B. To assure unity of responsibility, pump motor support equipment, such as discharge elbow, guide rail, base plate, cable holders, wet well access hatch, etc., shall be as specified by the pump manufacturer. The CONTRACTOR shall assume responsibility for the satisfactory installation and operation of the entire pumping system.

C. The work covered by this section consists of furnishing all labor, equipment, services, materials, products and tests to perform all operations in connection with the construction/installation of a complete combination lift station/wet well as shown on the plans, defined in these specifications and subject to the terms and conditions of this Contract, including but not limited to the following:

1. Excavation and Backfill
2. Wet Well and Valve Vault
3. Pumps
4. Electrical
5. Force Main
6. Bypass Pumping

1.03 SUBMITTALS

A. The CONTRACTOR shall submit to the ENGINEER for preliminary approval of the construction materials selected and shall furnish to the ENGINEER shop drawings of the complete pre-fabricated lift station for approval. Shop drawings shall illustrate all dimensions, reinforcements, joint details, protective coatings, materials and material specifications.

B. The CONTRACTOR shall submit a certificate from the equipment manufacturer stating that the installation of the equipment is satisfactory, that the equipment is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication and care of each unit.

C. CONTRACTOR shall submit a complete wiring schematic for the pump station package.

PART 2 - PRODUCTS

2.01 WET WELL AND VAULT

A. Wet well shall be constructed at the location shown and to the dimensions and depths indicated on the plans. The Contractor shall verify the dimensions and depths indicated on the plans.

2.02 PUMPS

A. The pumps (supplied by CONTRACTOR) shall be submersible type. Operational characteristics shall be as shown on the plans. The pumps shall alternate in service and operate in accordance with the sequence outlined on the plans. An air bubbler system shall be used for actuation with two sealed mercury switches for emergency high and low water levels.

B. Pump Design:

1. The pump(s) shall be capable of handling raw, unscreened sewage. The design shall be such that the pump unit will be automatically and firmly connected to the discharge piping when lowered into place on its mating discharge connection, permanently installed in the wet well. The pump shall be easily removable for inspection or service, requiring no bolts, nuts or other fastenings to be disconnected. For this purpose, there shall be no need for personnel to enter the wet well. Each shall be fitted with a stainless steel chain of adequate strength and length to permit raising and lowering the pump for inspection or removal. The pump, with its appurtenances and cable, shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 165 feet.

C. Pump Construction:

1. All major parts, such as the stator casing, oil casing, and impeller shall be of cast iron. The pump shall be equipped with a single channel impeller specifically designed to prevent clogging. All surfaces coming into contact with sewage shall be protected by a coating of rubber asphalt paint resistant to sewage. All exposed bolts and nuts shall be of stainless steel.

2. The wear ring system shall be bronze and installed to provide efficient sealing between the volute and impeller. The impeller shall be gray cast iron of non-clogging design, capable of handling solids, fibrous material, heavy sludge and other matter found in sewage applications. The impeller shall be constructed with

a long throughlet without acute turns. The impeller shall be dynamically balanced. Static and dynamic balancing operations shall not deform or weaken it. The impeller shall be a slip fit to the shaft and key driven. Non-corroding fasteners shall be used.

3. Each pump shall be provided with a mechanical rotating shaft seal system running in an oil reservoir having separate, constantly hydro-dynamically lubricated lapped seal faces. The (lower) seal unit between the pump and oil chamber shall contain one stationary and one positively driven rotating tungsten-carbide ring. The (upper) seal unit between the oil sump and motor housing shall contain one stationary tungsten-carbide ring and one positively driven rotating tungsten carbide ring. Each interface shall be held in contact by its own spring system supplemented by external liquid pressures. The seals shall require neither maintenance nor adjustment, but shall be easily inspected and replaceable. Shaft seals without positively driven rotating members or conventional double mechanical seals with a common single or double spring acting between the upper and lower units, requiring a pressure differential to offset external pressure and effect sealing shall not be considered acceptable nor equal to the dual independent seal system specified. The shaft sealing system shall be capable of operating submerged to depths of, or pressures equivalent to 65 feet. No seal damage shall result from operating the pumping unit out of its liquid environment. The seal system shall not rely upon the pump media for lubrication.

4. A sliding guide bracket shall be an integral part of the pump unit. The volute casing shall have a machined discharge flange to automatically and firmly connect with the cast iron discharge connection, which when bolted to the floor of the sump and discharge line, will receive the pump discharge connecting flange without the need of adjustment, fasteners, clamps or similar devices.

5. Installation of each pump unit to the discharge connection shall be the result of a simple linear downward motion of the pump unit guide by no less than two 2" stainless steel guide bars.

6. No other motion of the pump unit, such as tilting or rotating, shall be required. Sealing of the discharge interface by means of a diaphragm, O-ring or other devices will not be considered acceptable nor equal to a metal to metal contact of the pump discharge flange and mating discharge connection specified and required. No portion of the pump unit shall bear directly on the floor of the wet well. There shall be no more than one 90° bend allowed between the volute discharge flange and station piping.

7. The pump motor shall be housed in a water-tight casing and shall have moisture resistant Class F insulation rated for 311°F. The motor shall be NEMA Design B and designed for continuous duty and rated for 20 starts/hour. The motor service factor shall be 1.15 minimum.

8. The cable entry water seal design shall be such that precludes specific torque requirements to insure a watertight and submersible seal. Epoxies, silicones or other secondary sealing systems shall not be required or used. The cable entry

junction box and motor shall be separated by a stator lead sealing gland or terminal board which shall isolate the motor interior from foreign materials gaining access through the pump top.

9. Pump motor cable installed shall be suitable for submersible pump applications and this shall be indicated by a code or legend permanently embossed on the cable. Cable sizing shall conform to NEC specifications for pump motors and shall be of adequate size to allow motor voltage conversion without replacing the cable. Motor electrical cables shall be of sufficient length to extend from the motor to the above ground disconnect switch unspliced, unless the valve pit distance is greater than 4' from the wet well, or the control panel is more than 4' from the valve pit, in which case an electrical junction box shall be required.

10. All mating surfaces of major parts shall be machined and fitted with nitrile O-rings where watertight sealing is required. Machining and fitting shall be such that sealing is accomplished by automatic compression in 2 planes and O-ring contact made on four surfaces, without the requirement of specific torque limits to affect this. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered adequate nor equal.

11. Tolerances of all parts shall be such that allows replacement of any part without additional machining required to insure sealing as described above. No secondary sealing compounds, greases or other devices shall be used.

12. Each unit shall be provided with an adequately designed cooling system. Thermal radiators integral to the stator housing, cast in one unit, are acceptable. Where water jackets alone or in conjunction with radiators are used, separate circulation shall be provided. Cooling media channels and ports shall be non-clogging by virtue of their dimensions. Provision for external cooling and flushing shall be provided.

13. Integral thermal sensors shall not be a requirement on any unit without a water jacket. Thermal sensors shall be used to monitor stator temperatures on any unit with a water jacket. There shall be one for each phase group in the motor. These shall be used in conjunction with and supplemental to external motor over current protection and available at the control panel.

14. All units of 100 HP or more shall have thermal sensors monitoring bearing temperatures in addition to the motor thermal sensors described above. Bearing thermal monitors shall be independent of the motor sensors and available at the control panel circuitry to effect alarm and/or shut down functions.

D. Pump Test:

1. The pump manufacturer shall perform the following inspections and tests on each pump before shipment from factory.

   a. Impeller, motor rating and electrical connections shall first be checked for compliance to the customer's purchase order.

b. A motor and cable insulation test for moisture content or insulation defects.

c. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.

d. The pump shall be run for 30 minutes submerged, a minimum of 6 feet under water.

e. After operational test (item d), the insulation test (item b) is to be performed again.

f. Test shall consist of checking the unit at its noted speeds for head capacity, efficiency and brake horsepower at a number of points to properly establish the performance curve.

2. A certified written test report and performance curve stating the foregoing have been done shall be supplied with each pump at the time of shipment.

3. The pump cable end will then be fitted with a shrink fit rubber boot to protect it prior to electrical installation.

E. Pump Warranty:

1. The pump manufacturer shall warrant the units being supplied to the OWNER against defects in workmanship and materials for a period of five (5) years under normal use, operation and service. The warranty shall be in printed form and apply to all similar units.

F. Documentation:

1. Standard drawings supplied shall include pump outlines, controls, access frames and typical installation guides. Each station shall be supplied with installation and maintenance manuals and pump parts lists for the pumps installed. Electrical control wiring diagrams shall accompany each control.

2.03 ELECTRICAL

A. All work shall be in conformance with the National Electric Code, NEMA, Florida Building Code, the requirements of the OWNER and regulatory authorities having jurisdiction over the project.

B. Control Panel:

1. The control panel shall be completely factory wired with all necessary motor starters, circuit breakers, etc. for complete operation of the pumps. It shall be of the safety type and components shall bear the label of approval of Underwriters Labs; as well as meeting all applicable requirement of NEMA

C. Valve Vault Hatch:

1. Shall be U.S. Foundry or equal aluminum access hatch suitable for 300 P S F loading or H20 loading as indicated on the Drawings, with all stainless steel hardware. Hatch to be equipped with automatic hold open arms, watertight slam lock, recessed padlock, safety chains, and hinges to be attached using tamper proof carriage bolts with welded nuts.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation shall be in strict accordance with the manufacturer's instructions and recommendations in the locations shown on the drawings. Installation shall include furnishing the required oil and grease for initial operation. The grades of oil and grease shall be in accordance with the manufacturer's recommendations.

B. Pipe handling. All loading or unloading of pipe, fittings, valves and accessories shall be done in such a manner so as to avoid damage. The pipe shall not be skidded or rolled against pipe already unloaded.

C. Force mains shall be constructed as specified on the Plans. Fittings 4 inches and over shall be properly anchored and braced with restrained joints conforming to the details shown in the plans.

D. The interior of all pipe, fittings and other appurtenances shall be kept free of dirt and foreign matter at all times. Pipe shall be flushed clean before valves and other appurtenances are installed.

E. Pipe laying. All pipe shall be laid to line and grade with valves stems plumb. All pipe shall have a minimum cover of 36 inches for PVC pipe.

F. All fittings, encasement and appurtenances shall be incidental to the cost of furnishing and installing the force mains, unless separate payment for such items is provided in the Bid Schedule.

3.04 INSPECTION AND TESTING

A. The ENGINEER shall have the right to inspect, test or witness tests of all materials or equipment to be furnished under these Specifications, prior to the shipment from the point of manufacture.

B. The ENGINEER shall be notified in writing prior to initial shipment, in ample time so that arrangements can be made for inspection by the ENGINEER.

C. The ENGINEER or his representative shall be furnished all facilities, including labor, and shall be allowed proper time for inspection and testing of material and equipment.

D. Materials and equipment shall be tested or inspected as required by the ENGINEER, and the cost of such work shall be included in the cost of the equipment. The CONTRACTOR shall anticipate that delays may be caused because of the necessity of inspection, testing and accepting materials and equipment before their use is approved.

E. The services of a factory representative shall be furnished for one (1) day and shall have complete knowledge of proper operation and maintenance to inspect the final installation and supervise a test run of the equipment.

F. Field tests shall not be conducted until such time that the entire installation is complete and ready for testing.

3.05 PUMP TESTING

A. After all pumps have been completely installed, and working under the direction of the manufacturer, conduct in the presence of the ENGINEER such tests that are necessary to indicate that pump efficiency and discharge conform to the Specifications. Field tests shall include all power, water or wastewater, labor, equipment and incidentals required to complete the field tests.

B. If the pump performance does not meet the Specifications, corrective measures shall be taken or pumps shall be removed and replaced with pumps which satisfy the conditions specified.

3.06 MOTOR TESTING

A. The CONTRACTOR shall check all motors for correct lubrication in accordance with manufacturer's instructions. The CONTRACTOR shall check direction of rotation of all motors and reverse connections, if necessary.

3.07 ELECTRICAL

A. All electrical wiring shall comply with the minimum requirements of the Florida Building Code, National Electric Code, and Underwriters Laboratories.

END OF SECTION 02532

SECTION 02535

STRUCTURES AND MAINTENANCE ACCESS STRUCTURES (M.A.S.)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 WORK INCLUDED

A. The work covered by this section shall include the furnishing of all labor, equipment, services, materials, products and tests to perform all operations in connection with the construction of all structures as shown on the plans, defined in these specifications and subject to the terms and conditions of this contract, including, but not limited to, M.A.S., catch basins, and inlets.

1.03 RELATED WORK

A. Section 02300 - Earthwork.

B. Section 02305 - Excavation and Backfilling for Utilities.

1.04 SUBMITTALS

A. The CONTRACTOR shall furnish the ENGINEER shop drawings of the precast M.A.S. for approval. Shop drawings should illustrate all dimensions, reinforcements and specifications for the complete manual.

1.05 DEFINITIONS

A. Maintenance Access Structures shall be designated as M.A.S.

PART 2 - PRODUCTS

2.01 MORTAR

A. Mortar for use in constructing and plastering sewer structures shall conform to ASTM C-270, "Specifications for Mortar for Unit Masonry". A Portland cement-hydrated lime mixture or a masonry cement may be used provided that the same materials are used throughout the project.

B. Mortar materials shall be proportioned by volume and shall consist of one part Type II Portland Cement to two parts aggregate (sand). Portland Cement shall conform to ASTM

C-150, "Specifications for Portland Cement". Aggregate shall conform to ASTM C-144, "Specifications for Aggregate for Masonry Units."

2.02 PRECAST CONCRETE M.A.S.

A. Precast M.A.S. sections shall conform to the plans or ASTM C-478, Specifications for Precast Reinforced Concrete Manhole Sections as modified thereto whichever is more restrictive. Concrete shall attain a minimum compressive strength of 4,000 psi at 28 days. Minimum wall thickness shall be 8 inches.

B. Unless otherwise specified on the plans, all joints shall be made with neoprene or rubber "O" ring compression joints; mastic joint sealing compound, or approved equal. After assembly, all joints shall be filled with mortar and pointed to provide a smooth surface without joint voids.

C. The base and walls that compose the bottom section of precast M.A.S. shall be of monolithic construction, minimum 8 inches thick, and the edge of the base slab shall project a minimum 4 inches beyond the outside diameter of the wall.

D. Holes for piping shall be 6 inches larger than the outside diameter of the respective pipe. After the pipe is set, the void space between the pipe and the hole perimeter shall be completely filled with non-shrinking, quick-setting, waterproof cement mortar and struck smooth.

E. The minimum height of precast base section shall be 36 inches from the bottom of the base slab; however, no holes for piping shall be cast less than 8 inches from the top of the base section or less than 2 inches from the top of the base slab.

2.03 ENDWALLS, CATCH BASINS, INLETS AND JUNCTIONS BOXES

A. Endwalls, catch basins, inlets and junction boxes shall be constructed at the locations shown and to the dimensions indicated on site plans. Unless otherwise specified on the plans, inlets, junction boxes, catch basins, and similar structures may be constructed of brick, concrete block, poured concrete or precast concrete. Precast catch basins shall conform to latest A.C.I. and P.C.A. specifications. Concrete shall have not less than 4,000 psi compressive strength at 28 days. Minimum wall thickness shall be six inches.

B. Unless otherwise specified on the plans, all concrete for these structures shall be Class I concrete as specified in the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", latest revision, Section 345. Mortar for use in constructing and plastering shall be as previously set forth in this section.

C. Brick shall be solid hard-burned clay conforming to ASTM Serial C-32-93, Grade SM. Concrete brick shall conform to ASTM Serial C-55-75, Grade P-I. Concrete block shall conform to ASTM Serial C-90-78, Grade PI.

D. All brick or concrete block structures covered in this Section shall be plastered inside and outside with 1/2 inch of cement mortar. Inside surfaces shall be smooth and even.

E. Base slabs and walls of concrete structures shall be constructed in a continuous pour between expansion joints.

F. For each grate type inlet, two layers of Mirafi 140 fabric of "Poly Filter X" polypropylene material or approved equal, shall be sandwiched between 2 x 2 x 10/10 welded wire fabric cut to the grate size and attached to the underside of the grate. The sandwiched filter material shall be wired to the cross members of the grate each way on 4-inch centers. After inlet construction and the roadway construction is completed and the project site work (including landscaping) has been established, the filter material and fabric shall be removed with any retained silt or sand.

2.04 CASTINGS (INCLUDING FRAMES, COVERS AND GRATINGS)

A. All castings shall be made of clean, even grain, tough grey cast iron. The castings shall be smooth, true to pattern and free from projections, san holes, warp and other defects. The horizontal surface of the frame cover seats and the under surface of the frame cover seat which rests upon the cover seat shall be machined. After machining, it shall not be possible to rock any after it has been seated in any position in its associated frame. Machining shall be required only on those frames and covers intended for vehicular traffic.

B. Bearing surfaces between cast frames, covers and grates shall be machined and fitted together to assure a true and even fit. Within areas of vehicular traffic, the frames, covers and gratings shall be machined-ground so that irregularity of contact will be reduced to a minimum and will be rattle-proof.

C. All M.A.S. covers shall be provided with concealed pick holes. Manufacturer's name and catalog number shall be cast on all frames, covers, grates, etc. Covers shall be lettered "Storm" "Storm Drain" or "Storm Sewer" or "Sanitary Sewer" as applicable and shall be plainly visible. The M.A.S. frames and covers shall be flush with finished grade.

D. Grates and covers for inlets shall be as shown on the plans, set to the grades indicated and conforming with the requirements of the castings described above. Grates shall be furnished complete with frames specifically constructed to provide full bearing at all points of contract.

PART 3 - EXECUTION

3.01 CHANNELS

A. Channels shall be accurately and smoothly formed in accordance with the plans. Channels shall be constructed of concrete with trowel finished surfaces. The upper surface of the M.A.S. shall be sloped toward the channels as shown.

B. Drop pipe at sanitary sewer M.A.S. shall be installed when the difference in elevation between the pipe invert and the invert at the center of the M.A.S. exceeds two feet (2'), or where directed by the ENGINEER. The drop M.A.S. shall be built according to the plans and specifications.

C. After channels are formed and section joints are pointed, the interior of the M.A.S. shall be painted with two coats of Agru Suregrip or approved equal (8 mils per coat), first coat is red and the second coat is black. The exterior shall be painted in the same manner.

3.02 CONCRETE GRADE RINGS

A. All concrete grade rings shall meet ASTM C478 and shall be a minimum 4,000 psi @ 28 days. Concrete grade rings shall be a minimum thickness of 2 inches and a maximum thickness of 6 inches. No more than 8 inches of concrete grade rings shall be installed on one M.A.S. Concrete grade rings shall be laid in mortar and all joints shall be finished smooth and not be less than ¼ inch or more than ½ inch in thickness. Interior and exterior of concrete grade rings shall be painted with two coats of Agru Suregrip (8 mils per coat) or approved equal.

3.03 M.A.S. AND STRUCTURES

A. All joints shall be finished water tight, all openings for sewers, frames, etc., in precast M.A.S. and catch basins shall be cast at time of manufacture. Spaces around all piping entering or leaving M.A.S. shall be completely filled with Embeco mortar or equal.

B. All M.A.S. shall be set plumb to line and grade and shall rest on a firm carefully graded subgrade which shall provide uniform bearing under base.

C. Grout for M.A.S. bottoms shall consist of broken block, brick and 2:1 cement mortar.

3.04 CLEANING AND MAINTENANCE

A. All structures shall be cleaned and maintained in workable condition until accepted by the ENGINEER.

END OF SECTION 02535

SECTION 02741

ASPHALTIC CONCRETE PAVING - GENERAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 WORK INCLUDED

A. This section of the specifications covers the control and general conduct of asphalt paving construction for roads, parking, walks and court areas.

B. All work within the right-of-way shall be constructed using materials and methods in accordance with the drawings, City of Lake Worth and Florida Department of Transportation Standard Specifications for Road and Bridge Construction.

1. Grade deviations from Contract and Drawings shall conform to Section 02310, Site Grading.

C. Provide all labor, materials, necessary equipment and services to complete the Asphaltic Concrete Paving work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

D. Including, but not necessarily limited to the following:

1. Preparation of subgrade.

2. Installation and compaction of base course.

3. Spreading of asphalt surface course.

1.03 RELATED WORK

A. Section 02300 - Earthwork.

B. Section 02310 - Site Grading

C. Section 02630 - Storm Drainage Facilities.

D. Section 02751 - Portland Cement Concrete Paving.

1.04 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials (AASHTO)

1. M140 - Standard Specification for Emulsified Asphalt Nineteenth Edition; Revised Per Interim Specifications - Specifications - 1999 R(1998)

2. M226 - Standard Specification for Viscosity Graded Asphalt Cement Nineteenth Edition R(1996)

3. T245 - Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus Nineteenth Edition; ASTM D1559-76

B. American Society for Testing and Materials (ASTM)

1. D1559 - Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.

2. D2041 - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

3. D2171 - Standard Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer (RAP Asphalt Mixes)

C. Asphalt Institute (AI)

1. MS-2 - Mix Design Method for Asphalt Concrete and Other Hot Mix Types

2. MS-22 - Principles of Construction of Hot-Mix Asphalt Pavement, Addendum

1.05 TRAFFIC CONTROL

A. The CONTRACTOR shall provide and maintain access to and from all properties along the line of his work. The CONTRACTOR shall also provide temporary by-passes and maintain them in a safe and usable condition whenever detouring of traffic to parallel routes cannot be done without hardship or excessive increases in travel by the public.

1.06 SPECIAL SUBGRADE CONDITIONS

A. When special subgrade conditions are encountered for which these "Asphaltic Concrete Paving Specifications" are not applicable, portions of these specifications shall be deleted or revised to provide a properly finished paved surface. A requested revision or deletion of the specifications shall be accompanied with reports and laboratory tests on existing field conditions. Any change from these "Asphaltic Concrete Paving Specifications" shall be approved by the ENGINEER and shall be in effect only for a specified area or paving project.

1.07 QUALITY ASSURANCE

A. D.O.T. Standard Specifications.

1. Work and materials shall conform to all applicable requirements of Florida Department of Transportation "Standard Specifications for Road and Bridge Construction - 2000" (referred to herein as D.O.T.).

B. American Society for Testing and Materials.

1. ASTM 3515-80 "Standard Specification for Hot-Mixed, Job Laid, Bituminous Paving Mixtures."

1.08 SUBMITTALS

A. Job Mix Designs: CONTRACTOR shall submit a mix design for each pavement course proposed for construction for the OWNER's review and approval 45 days prior to schedule production and lay down of the mix. The design mix submittal shall be formatted as indicated in Asphalt Institute Manual MS-2, the "Marshall Stability Method"; and shall include type/name of mix, gradation analysis, grade of asphalt cement, Marshall Stability in pounds flow, effective asphalt content in percent (%), and corresponding copies of governing State Department of Transportation (DOT) material specifications or regulatory authorities having jurisdiction for each proposed material.

B. The CONTRACTOR may submit to the OWNER a superpave asphalt mix design for review and approval, in lieu of a Marshall Mix Design asphalt, meeting the specifications of the governing State Department of Transportation or regulatory authorities having jurisdiction.

C. Material Certificates: CONTRACTOR shall submit certificates stating that asphalt mix to be supplied complies with the specifications of the governing State Department of Transportation (DOT) or regulatory authority having jurisdiction, as well as copies the regulatory specifications corresponding to the asphalt mix formula and material. The certificates shall be signed by the asphalt mix producer and the CONTRACTOR.

1.09 JOB CONDITIONS

A. Apply prime and tack coats when ambient temperature is above 50 degrees, and when temperature has not been below 35 degrees for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.

B. Construct asphalt concrete surface course only when atmospheric temperature is above 40 degrees, and when base is dry. Base course may be placed when air temperature is above 30 degrees, and rising.

1.10 LOCATIONS, LAYOUT AND GRADES

A. Locate and layout paved areas and right-of-ways with reference to benchmarks, property lines or buildings according to the drawings and as accepted by the ENGINEER. Contractor shall not utilize electronic files from the ENGINEER for layout.

B. Determine locations of paved edges and right-of-way line from surveyor's permanent reference monuments and information on the Horizontal Control drawings.

C. Where permanent reference monuments are not available, obtain proper line locations from authorities having jurisdiction.

D. Establish and maintain required lines and elevations.

E. Furnished rock as-builts shall demonstrate a positive flow along the edge of pavement and road crown from the high point to the low point (catch basin /inlet) as indicated on the contract drawings.

PART 2 - PRODUCTS

2.01 FILL

A. All fill shall be clean rock and sand (maximum rock size = 1 inch).

B. Fill shall be compacted thoroughly as per Section 02300 - Earthwork.

2.02 LIMEROCK

A. Limerock shall be obtained from pits for which all overburden has been removed previous to blasting and shall show no tendency to air slake and must undergo the following chemical requirements.

		Percent
1.	Carbonates of Calcium	Min.70.0 (Miami Limerock) and Magnesium. (24' roadway) Min 60.0 (Miami Limerock) and Magnesium. (22' roadway) 95.0 (Ocala Limerock)
2.	Oxides of Iron and Aluminum	Max. 2.0
3.	Organic Matter	Max. 0.5

4. Any constituents of other than the above shall be silica or inert material.

5. The material shall be crushed to such size that not less than 97% shall pass a 3-1/2" sieve and it shall be graded uniformly down to dust. All fine material shall consist entirely of dust of fracture.

6. Limerock from on-site may be used if the material meets the requirements of this section of the specifications.

B. All limerock shall comply with requirements set forth under D.O.T. Section 911.

C. Equipment: The equipment for constructing the rock base shall be in first class working condition and shall include:

1. Vibratory compactor weighing not more than three tons. If approved in writing by the ENGINEER, larger vibratory compaction equipment may be allowed if operated in static mode only.

2. Self-propelled blade grader weighing not less than three tons. The wheel base shall be not less than fifteen feet and blade length not less than ten feet.

3. Scarifiers shall have teeth space not to exceed 4-1/2 inches.

4. Provision for furnishing water at the construction site by tank or hose at a rate not less than 50 gallons per minute.

2.03 PRIME COAT

A. Prime coat shall be Grade RC-70, cut-back asphalt, D.O.T. Section 916-2.

B. Prime coat shall have full compatibility with surface treatment asphalt.

C. The bituminous material shall conform to the requirements of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Section 300-2.

D. The sand for cover shall be clean dry sand.

2.04 TACK COAT

A. The bituminous material to be used for the tack coat shall conform to the requirements of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Section 300-2.

2.05 ASPHALT

A. 1. The asphaltic concrete surface course shall be in accordance with Palm Beach County, Florida Department of Transportation Standard Specifications for Type S-1 and Type S-III Asphaltic Concrete Surface Course.

2. Pavement within public road right-of-way which has been disturbed by this construction shall be replaced with the same type to match the existing pavement section.

3. Final lift of asphaltic concretes shall be virgin material only and shall be placed at the end of the project. (First lift may be R.A.P. (reclaimed asphaltic paving) in accordance with DOT standards).

B. General composition of mixtures:

1. The aggregate in the asphaltic concrete shall be crushed stone and manufactured sand screening of natural sand or combination of both when necessary to meet requirements of composition of mix. All aggregate shall have a Los Angeles abrasion loss of less than 40%.

2. The mineral aggregate shall be so graded, and the prescribed constituents, prepared as hereinafter set out, shall be combined in such proportions as to produce a mixture conforming to the following general composition limits by weight:

Constituent	Passing Sieve	S-1 Percent by Weight	S-III Percent by Weight
Course Aggregate	3/4"	100	100
	1/2"	88-98	100
	3/8"	75-93	88-98
	No. 4	47-75	60-90
Total Course Aggregate	No. 10	31-53	40-70
Fine Aggregate	No. 40	19-35	20-45
	No. 80	7-21	10-30
Filler	No. 200	2-6	2-6
Total Fine Aggregate and Filler	No. 10	100	100
Total Mineral Aggregate		100	100
Total Mix		100	100

Constituent	Percent by Weight
Total Mineral Aggregate	91-95
Asphalt Cement	5-9*
(Bitumen) Total Mix	100

*For highly absorptive aggregates the upper limit may be raised.

2.06 SEAL COATING

A. Homogeneous mixture of emulsified coal tar pitch, asbestos, sand and other inert fillers. It shall be easily remixed if settlement occurs in storage (except in the case of freezing). It shall be capable of application and complete coverage by rubber squeegee, brush, or approved mechanical method, to the surface of bituminous pavements at the spreading rate of 0.2 to 0.3 gallons per square yard in two coats.

B. Approved product: "TARFEX" manufactured by Bitucote Products Co. or approved equal.

PART 3 - EXECUTION

3.01 COLD MILLING

A. Milling of existing asphalt pavement shall be at the depth and location as indicated on the Construction Drawings or as directed by the OWNER.

B. The milled surface shall be reasonably smooth and free of excessive scarification marks, gouges, ridges, continuous grooves, or other damage. The milled pavement surface shall be thoroughly cleaned of all loose aggregate particles, dust, and other objectionable material by the use of power brooms, power blowers, power vacuums or other means.

C. The CONTRACTOR shall coordinate the adjustment of manhole, meter boxes, drainage inlets, and valve boxes with the milling operation.

D. All milled material shall become the property of the CONTRACTOR and shall be disposed of off-site or used in conformance with Section 02300, Earthwork, or for utilization as Reclaimed Asphalt Pavement, in conformance with the specification provided above, as approved by the OWNER.

3.02 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated or directed by the OWNER. Re-compact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 gal/sy.

C. Patching: Fill excavated pavements with hot-mix asphalt base mix, and while it is still hot, compact flush with adjacent surface.

3.03 BARRICADES

A. Provide substantial temporary barricades around all areas of operation and maintain until work under this section is completed and approved.

B. Install temporary traffic markers, signals, and signs as per Palm Beach County Highway Construction & Engineering Services Division Standard Specification to:

1. Eliminate potentially hazardous conditions.

2. Maintain adequate traffic patterns free of conflict with work under this Contract.

3.04 PREPARATION OF SUBGRADE

A. This work consists of bringing the bottom of excavations and top of embankments of the roadway between the outer limits of the shoulders or base course to a surface conforming to the grades, lines, and cross sections shown on the plans. The subgrade shall be of uniform density ready to receive the rock base of the paving course.

B. 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 entire subgrade brought to line and grade to provide a foundation of uniform compaction and supporting power.

C. Stumps, roots, and other deleterious organic matter encountered in the preparation of the subgrade shall be removed.

D. Where fills are required on areas covered or partly covered by existing paving, the entire area of such existing paving shall be scarified to a depth of at least six inches, and the scarified material spread evenly over the area to be filled to a width not less than that of the proposed paving.

E. Material for fills shall consist of sand or other suitable material approved by the ENGINEER free from stumps, roots, brushes, and other deleterious organic matter.

F. Where fill is more than 1 foot in depth, the backfill material above the ground water table shall be compacted in 8 inch depth lifts. Each individual layer of fill under the rock base shall have a density of 98% of the maximum density as determined by the AASHTO T- 180 unless shown otherwise on the plans. Each individual layer of fill under the shoulder area shall have a density of 98% of the maximum density as determined by AASHTO T- 180, unless shown otherwise on the plans.

G. The bottom of all excavated areas and the top of all fills where rock base is to be constructed shall be thoroughly compacted by rolling. Water shall be used to insure thorough compaction. The stability of the top 12 inch thickness of the subgrade immediately under the base, for the full base width plus 1 foot on each side, shall be minimum LBR 40.

H. Bring subgrade which has been properly filled and shaped to a firm unyielding surface, by rolling an entire area with an approved power roller:

1. Thoroughly compact area inaccessible to the roller with approved hand tamper.

2. Apply water sufficiently to compact the subgrade where the subgrade is of a dry, sandy nature and cannot be rolled.

I. The subgrade shall be maintained free from ruts, depressions or other irregularities until rock base material is spread.

J. For all roads, streets and paved areas other than State Highway, the stabilized subgrade shall have a minimum Limerock Bearing Ratio (LBR) of 40, unless otherwise noted on the plans.

K. Where the bearing value of the existing subgrade is adequate without addition of stabilizing material, the subgrade shall be scarified and disked, harrowed, bladed or tilled for removal of boulders, roots, etc. to assure uniformity and thorough mixing of material to the full width and depth of required stabilization. The compacted subgrade shall conform to the lines, grades and cross-section shown on the plans.

L. Test subgrade for crown and elevation after preparation and immediately before base of paving course is laid:

1. Remove or add material and compact to bring to a correct elevation and uniform bearing if the subgrade is found not to be at the specified elevation at all points.

2. Adjust the manhole rims, catch basin frames and valve boxes where necessary to match proposed finish grade.

3.05 CONSTRUCTION OF BASE COURSE

A. This work consists of construction of lime rock base course for the asphaltic concrete wearing surface. The base course shall be constructed on the prepared subgrade in a 8 inches thick limerock bases constructed in two four inch lifts as shown on the drawings. Twelve (12) inch thick limerock bases shall be constructed in two six-inch lifts. The limerock base shall be a minimum LBR of 100.

B. Spreading Rock: The rock shall be transported to the points where it is to be used over rock previously placed, and dumped on the end of the preceding spread. It shall then be spread uniformly with hand tools, or mechanical equipment. In no case shall rock be dumped directly on the subgrade. No hauling shall be done over the subgrade.

C. Compacting Rock:

1. Following spreading, the rock shall be rolled with a three wheel roller weighing not less than ten tons, water being added as required, until the entire depth of base is compacted into a dense unyielding mass.

2. No greater area of rock base shall be placed during any one day than that which can be rolled and compacted on the same day.

D. Finishing Base:

1. After watering and rolling, the entire surface shall be thoroughly scarified to a depth not less than 4 inches and shaped to exact crown and cross section, re-watered and again thoroughly rolled. Rolling shall continue until the entire depth of base is bonded and compacted into a dense, unyielding mass, true to grade and cross section.

   a. Any irregularities which may develop in the surface during such finishing shall be corrected by the removal or addition of rock as the case may be.

   b. If at any time the subgrade material becomes churned up and mixed with the base rock, the CONTRACTOR shall dig out and remove the mixture, reshape and compact the subgrade and replace the materials removed with clean rock which shall be watered and rolled until satisfactorily compacted.

   c. Where cracks or checks appear in the base either before or after priming, which in the opinion of the ENGINEER would impair the structural efficiency of the base course, the CONTRACTOR shall remove such cracks or checks by re-scarifying, reshaping, watering, rolling and adding rock where necessary.

   d. During final compacting operations, if grading of any areas is necessary to obtain the true grade and cross section, the compacting operations for such areas shall be completed prior to making the density tests on the finished base.

E. Inferior Rock: If in the opinion of the ENGINEER at any time during the progress of the work, rock of inferior quality is being delivered to the construction site, a laboratory analysis of the rock shall be made. Should the results of such tests indicate that the rock does not conform to specifications, the CONTRACTOR shall, at his own expense, remove such inferior material from the area indicated and deliver and spread satisfactory rock on said area.

F. Testing Surface: The finished surface of the rock base shall be true to the required cross section. Any irregularities in the grade greater than 1/4", as determined by placing a ten foot straight edge parallel with the centerline and use of full width crown board, shall be corrected by scarifying to a depth of 3 inches, removing or adding rock as may be required and again watering, rolling, and compacting the scarified area. In testing the surface for irregularities, the measurements under the straight edge shall not be taken in small holes caused by individual pieces of rock having been pulled out by the road grader. The finished rock base shall provide positive flow from the high point to the low point (catch basin/inlet) as indicated on the Contract Drawings.

G. Thickness Determination: Thickness of the base shall be measured by intervals as required by the ENGINEER. Measurements shall be taken at various points on the cross

section. The measurements shall be taken in holes through the base of not less than 3 inches in diameter. Where the base is more than 1/2" less than the required compacted thickness, the CONTRACTOR shall correct such areas by scarifying and adding rock. The affected areas shall then be watered, rolled and brought to a satisfactory state of completion, and of required thickness and cross section.

H. Density: Density determinations shall be made by the CONTRACTOR or at intervals required by the ENGINEER. An average required density shall be 98% of maximum density obtainable under AASHTO Method T-180. No section of base shall be accepted when more than 10% of tests fall below 98% of maximum density and in no case shall a density of less than 96% of maximum be accepted.

I. Testing: The CONTRACTOR shall coordinate with ENGINEER for all testing. One test shall be made in accordance with AASHTO, T-180 for each class of material in the subgrade and base:

1. In place density tests in accordance with AASHTO T-147 shall be made in the locations shown on the plans. Two copies of the test reports will be sent directly to the ENGINEER for evaluation.

2. Any material which fails to meet these specifications shall be removed, replaced, and retested, all at the CONTRACTOR's expense.

3. Tests shall be taken at least every 1,000 square yards and taken at locations and lifts as directed by the ENGINEER.

3.06 PRIME COAT FOR BASE COURSE

A. Cleaning the prepared base:

1. Before any bituminous material is applied, all loose material (dust, dirt, caked clay and foreign matter) which might prevent proper bond with the existing surface shall be moved to the shoulders, to the full width of the treatment, by means of revolving brooms or approved mechanical sweepers and by mechanical blowers, of approved types, supplemented by hand sweeping. Dust and other loose materials not removed by mechanical means shall be removed with hand brooms. Particular care shall be taken to clean the outer edges of the strip to be treated in order to insure that the prime coat will adhere. Sweeping and blowing shall be continued until all the loose dust and dirt is removed from the surfaces.

2. Application of bituminous material shall be made during the same day surface has been swept and as soon as practical thereafter.

B. Application for prime coat:

1. The bituminous material shall be applied to the clean dry surface of the rock base at such temperature as will insure uniform distribution. The amount applied will

be at the rate of approximately 0.10 to 0.20 gallons per square yard of base area. The application shall be made by means of self-propelled pressure distributor operating under a pressure not less than 20 pounds per square inch. Application of bituminous material shall be made on only one-half of the width of base at one time.

2. The primed base shall then be covered with a uniform layer of clean sand, and kept thoroughly and uniformly covered by additional sand or sweeping until it shows no signs of picking up under traffic. For a period of one week after priming, the CONTRACTOR shall again broom any area where insufficient cover sand or excess of bituminous material causes "bleeding" and, if necessary, spread additional sand on such area.

C. Prime coat finish: After prime has cured or sat and been sanded, the shoulder shall be shaped to conform to all grade lines and cross sections and the entire area shall be rolled and compacted with a rubber tired roller or a power roller before asphalt surface is laid on the finished base.

3.07 BITUMINOUS TACK COAT

A. Before applying any bituminous material, all loose material: dust, dirt and foreign material, which might prevent proper bond with the existing surface, shall be removed for the full width of the application.

B. Application for tack coat:

1. The surface to receive the tack coat shall be clean and dry. The tack coat shall be clean and dry. The tack coat shall be applied with a pressure distributor except that on small jobs, if approved by the ENGINEER, the application may be made by other approved mechanical methods or by hand methods. The pressure distributor shall operate at a pressure not less than 20 pounds per square inch and at a consistency such that it can be properly pumped and sprayed uniformly over the surface.

2. The bituminous material shall be applied in a thin uniform layer. The rate of application shall be between 0.02 and 0.10 gallon per square yard. The tack coat shall be applied sufficiently in advance of the laying of the wearing surface to permit drying, but shall not be applied so far in advance that it might lose adhesiveness as a result of being covered with dust or other foreign material. The tack coat surface shall be kept free from traffic until the wearing surface is laid.

3.08 ASPHALTIC CONCRETE WEARING SURFACE COURSE

A. Cleaning and preparing base:

1. Prior to the laying of the asphaltic concrete, the base of pavement to be covered shall be cleaned of all loose deleterious material by the use of power

brooms or blowers. A tack coat shall be applied on all pavement. The tack coat shall not be applied so far in advance of laying operations as to allow shifting and sand or weather conditions to nullify its effectiveness.

2. After the surface has been thoroughly cleaned, all holes shall be filled with asphaltic concrete, if necessary, and thoroughly compacted to conform to the existing surface and to form a smooth surface.

B. Placing asphaltic concrete: The asphaltic concrete surface course applied after the tack coat and be permitted a reasonable time for drying, but not to an extent that the tack coat is allowed to lose its adhesiveness:

1. Machine spreading: Upon arrival the mixture shall be dumped into the approved mechanical spreader and immediately spread and struck off to the full width required and to such appropriate loose depth for each successive course that when the work is completed the required weight of the mixture per square yard or the specified thickness will be secured. An excessive amount of mixture shall be carried ahead of the screen at all times. Hand raking shall be done behind the machine as required.

2. Hand spreading: In limited areas, where, on account of irregularities or unavoidable obstacles, the use of mechanical spreading and finishing equipment is impractical, the mixture may be spread by hand, when so authorized by the ENGINEER.

3. The mixture shall be laid only when the surface to be covered is dry and only when weather conditions are suitable.

4. All structures which will be in actual contact with asphaltic mixture, including the face or surface of curbs or gutters and their vertical faces of existing pavements, shall be painted with a uniform coating of asphalt material to provide a closely bonded, watertight joint.

5. Where necessary, due to the traffic requirements, the mixture shall be laid in strips in such manner as to provide for the passage of traffic.

6. Any mixtures caught in transit by a sudden rain may be laid at the CONTRACTOR's risk. In no case shall the mixture be laid while rain is falling or when there is water on the surface to be covered.

7. The depth of the layer being spread shall be gauged as directed, and where the thickness fails to average the specified thickness, immediate steps shall be taken to correct the depth.

8. Before any rolling is started, the course surface shall be checked, any inequalities adjusted, and all drippings, fat sand accumulations from the screed and fat spots from any source shall be removed and replaced with satisfactory material.

9. Straight-edging and back-patching shall be done after initial completion has been obtained and while the material is still hot. Any irregularity greater than 1/4" either longitudinally or traversely shall be corrected at this time.

10. No skin patching shall be done. When a depression is to be corrected while the mixture is hot, the surface shall be well scarified before the addition of fresh mixture. If irregularities occur and are not corrected while the mixture is still hot, the irregularities shall be cut out the full depth of the layer and replaced with fresh mixture.

C. Compacting mixture: After the spreading, the mixture shall be rolled when it has set sufficiently or come to the proper condition to be rolled, and when the rolling does not cause undue displacement or shoving:

1. The motion of the roller shall at all times be slow enough to avoid displacement and shall at once be corrected by the use of rakes and fresh mixture where required. The rolling shall include all transverse, longitudinal, and diagonal rolling, as may be necessary to obtain the maximum density.

2. The seal rolling with tandem steel rollers weighing from five to eight tons shall follow as close behind the spreader as is possible without picking up, or displacing or blistering the material.

3. Rolling with the self-propelled pneumatic-tired rollers shall follow as soon as possible and as close behind the seal rolling as the heat of the mixture will permit. The rolling shall be done while pavement temperature is between 175° and 240° F, and to such an extent that the self-propelled traffic roller shall cover every area of the surface with at least ten passes. Final rolling with tandem steel rollers shall be done after the rolling with self-propelled pneumatic tired rollers is completed. This final rolling shall be done before the pavement temperature is lower than 175° F, and shall be continued until all roller marks or tire marks are eliminated.

4. Self-propelled pneumatic rollers shall be used for the rolling of patching and leveling courses. At the option of the CONTRACTOR, a steel-wheeled roller may be used to supplement the self-propelled pneumatic-tired rollers but not more than one steel-wheeled roller may be used in conjunction with the necessary number of self-propelled pneumatic-tired rollers. After final completion, the finished pavement shall at no point have a density less than 95% of the laboratory compacted density.

5. Rolling with the self-propelled pneumatic-tired roller shall proceed at a speed from six to twelve miles per hour and the rate of rolling shall not exceed 3,000 square yards per hour per roller. A sufficient number of self-propelled pneumatic-tired rollers shall be used so that the rolling of the surface for the required number of 10 passes within this maximum rolling rate shall not delay any other phase of the placing operation and not result in excessive cooling of the mixture before the rolling is complete. In the event that the rolling is not properly

maintained to schedule as outlined above, the laying operation shall be discontinued until the rolling operations are sufficiently caught up.

6. In all places inaccessible to a roller, such as adjacent to curbs, headers, gutters, bridges, manhole, etc., the required compaction shall be secured with tamps. Depressions which may develop before the completion of the rolling shall be remedied by loosening the mixture laid and adding new material to bring such depressions to a true surface.

7. Should any depressions remain after final compaction has been obtained, the mixture shall be removed sufficiently and new material added to form a true and even surface. All high spots, high joints and honeycombs shall be adjusted as directed by the ENGINEER.

8. The mixture, after compaction, shall be of the thickness shown on the plans. After compaction, the surface shall not show an excess of asphalt. Any area showing such excess or other defect shall be cut out and replaced with fresh mixture and immediately compacted to conform with the surrounding area. Any mixture which becomes loose or broken, mixed with dirt in the wearing course shall be removed and replaced with fresh mixture which shall be immediately compacted to conform with surrounding areas.

9. Gasoline or oil from rollers shall not be allowed to deposit on the pavement and any pavement damaged by such deposits shall be removed and replaced as directed by the ENGINEER.

10. Any mixture remaining unbonded after rolling shall be removed and replaced.

D. Protection of pavement: After the completion of the pavement, no vehicular traffic of any kind shall be permitted on the pavement until it has set sufficiently as approved by the ENGINEER.

3.09 ASPHALT OVERLAY

A. Clean existing asphalt and clear of loose aggregate. Road edges shall be milled to a minimum depth of 1".

B. Risers shall be installed to bring existing manhole rims, valves, basins, etc to grade.

C. Structural patching necessary to seal existing cracks or pot holes shall be done prior to tack coat. Tack coat shall be applied to ensure proper adhesion between the old surface and new asphalt.

D. Hot mix asphalt shall be applied at the depth specified on the plans. All edges and ends shall be sloped to create a smooth seam between old and new pavement surfaces.

3.10 ABUTTING EXISTING PAVING

A. Meet elevation of existing paving and structures, facilities and utilities where applicable by feathering the thickness of the new surface course for not more than 1 foot in the periphery of the structure, facility or utility. Do not cover access covers, manhole tops, water meters or other similar devices.

3.11 PAVEMENT EDGES

A. Make edges of paved area conform to details and sections as shown on drawings.

3.12 SEAL COATING

A. Preparation of surface: Pavement to be sealed must be sound and free of loose dust, dirt, stones, or other foreign matter:

1. Repair any breaks or holes.

2. Scrape off accumulations of oil or fuel drippings and scrub with detergent and water. Remove all traces of detergent.

3. Soft or damaged spots must be repaired.

4. Flush entire area with clean water.

5. Pavement should be damp (no puddles or excess water) when seal coating is applied.

B. MIXING: Stir seal coating to a uniform consistency, use no solvents for thinning. Dilute seal coating with 10% to 20% clean water, stirring to uniform consistency.

C. Application:

1. Seal coat may be applied to dampened surface with a rubber squeegee, soft bristled push broom, or approved mechanized equipment.

2. Seal coating may be poured directly onto pavement in a ribbon or windrow. Squeegee is placed on pavement at a slight angle to edge line of pavement and pulled in a window along pavement in parallel lines, always working excess material toward bottom edge of squeegee.

3. Seal coating should be applied in two (2) thin coats. After first coat is completely dry to touch, a second coat may be applied at right angles to the first. Rate of application will depend on porosity of surface.

4. Allow to cure for 24 hours before opening to traffic.

5. Do not apply seal coating when temperature is below 50°F, or falling, before sealer is dry, or rain appears imminent or forecast.

6. Apply in strict accord with manufacturers published instructions.

3.13 FIELD QUALITY CONTROL

A. Test in place asphalt concrete course for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by ENGINEER:

1. In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:

a. Base Course: Not greater than 1/2" of specified thickness.

b. Wearing Course: Not greater than 1/4" of specified thickness.

2. Test finished surface of each asphalt concrete course for smoothness, using 10' straight edge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness.

a. Base Course Surface: 1/4".

b. Wearing Course Surface: 1/8".

B. Check surface area at intervals as directed by the ENGINEER.

C. Finish grade of asphaltic concrete wearing course shall be within ±0.04 feet of the grades indicated on the plans.

3.14 CLEAN UP

A. Remove all debris and excess material immediately from project site.

B. Take down all barricades and temporary traffic markers, signals and signs only after all work included in this section is finished and inspected, and only after so directed by the ENGINEER.

C. Leave project area clean, orderly and free of any hazardous conditions.

END OF SECTION 02741

SECTION 02751

PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 SUMMARY

A. This Section includes all portland concrete pavement, including but not limited to:

1. Driveways and roadways
2. Parking lots
3. Curbs and gutters
4. Sidewalks
5. Drainage Aprons

1.03 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the Portland Cement Concrete Paving work, as indicated on the drawings, as specified herein or both.

B. Including, but not necessarily limited to the following:

1. Fill, subgrade, and limerock base.
2. Concrete formwork.
3. Concrete reinforcement.
4. Isolation and contraction joints.
5. Concrete paving.

1.04 RELATED WORK

A. Section 02300 - Earthwork.

B. Section 02741 - Asphaltic Concrete Paving - General.

1.05 REFERENCE STANDARDS

A. American Society of Testing Materials (ASTM)

1. A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement

2. A185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement

3. A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

4. C33 - Standard Specification for Concrete Aggregates

5. C94 - Standard Specification for Ready-Mixed Concrete

6. C150 - Standard Specification for Portland Cement

7. C171 - Standard Specification for Sheet Materials for Curing Concrete

8. C260 - Standard Specification for Air-Entraining Admixtures for Concrete

9. C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

10. C494/C494M - Standard Specification for Chemical Admixtures for Concrete

11. C979 - Standard Specification for Pigments for Integrally Colored Concrete

12. C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete

13. D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

14. D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

15. D3405 - Standard Specification for Joint Sealants, Hot-Applied, for Concrete and Asphalt Pavements

16. D5249 - Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints

17. D5893 - Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements

B. American Concrete Institute (ACI)

1. 301R-99 - Specifications for Structural Concrete

2. 304R - Placing and Handling Concrete, etc.

3. 309R-96 - Guide for Consolidating of Concrete

4. 330.1 - Standard Specifications for Plain Concrete Parking Lots

5. 330R-92 - Guide for Design & Construction of Concrete Parking Lots

6. 211.1R-91 - Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete

B. American Association of State Highway and Transportation Officials (AASHTO)

1. M182 - Standard Specifications for Burlap Cloth made from Jute for Kenaf

2. M153 - Standard Specifications for Preformed Sponge Rubber and Cork Expansion Joint Filler

1.06 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies: Perform work in accordance with local building and other applicable codes.

B. Installation: Performed only by skilled workmen with satisfactory record of performance on completed projects of comparable size and quality.

C. Inspection and Testing: Performed in accordance with Sections 01330, 01410, and 01451 unless otherwise specified:

1. Test cylinders - as per ASTM C-39.

a. Minimum of three (3) concrete test cylinders shall be taken for every 75 or less cubic yards of concrete placed.

b. Minimum of one (1) additional test cylinder shall be taken during any cold weather concreting, and be cured on job site under same conditions as the concrete it represents.

2. Slump test - as per ASTM C-143:

a. Minimum of one (1) slump test shall be taken for each set of test cylinders taken.

1.07 SUBMITTALS

A. Test Reports: Reports of concrete compression, yield, air content, and slump tests.

B. Certificates:

1. Manufacturer's certification that materials meet specification requirements.

2. Material content on a cubic yard basis of each class of concrete furnished.

a. Dry weights of cement.

b. Saturated surface-dried weights of fine and coarse aggregate.

c. Quantities, type and name of admixtures.

d. Weight of water.

3. Ready-mix delivery tickets, ASTM C-94.

C. Shop Drawings:

1. Show sizes and dimensions for fabrication and placing of reinforcing steel and bar supports.

2. Indicate bar schedules, stirrup spacing, and diagrams of bend bars.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcement to project site in bundles marked with metal tags indicating bar size and length.

B. Handle and store materials to prevent contamination.

1.09 JOB CONDITIONS

A. Allowable concrete temperatures:

1. Hot weather: Maximum 90°F as per ASTM C-94.

B. Do not place concrete during rain, unless protection is provided.

PART 2 - PRODUCTS

2.01 FILL

A. As specified in Section 02741 - Asphaltic Concrete Paving - General

2.02 SUBGRADE

A. As specified in Section 02741 - Asphaltic Concrete Paving - General

2.03 LIMEROCK BASE

A. As specified in Section 02741 - Asphaltic Concrete Paving - General

2.04 READY-MIXED CONCRETE

A. Cement: ASTM C-150, normal Type 1.

B. Aggregate: ASTM C 33, uniformly graded, from a single source.

C. Water/Ready Mix Concrete: ASTM C 94.

D. Admixtures: Certified by manufacturer to contain not more than 0.1 % water-soluble chloride ions by mass of cement and to be compatible with other admixtures, as follows:

1. Air-Entraining Admixture: ASTM C 260;

2. Water-Reducing Admixture: ASTM C 494, Type A;

3. Water-Reducing and High-Range Admixture: ASTM C 494, Type F;

4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E; and,

5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

6. Fly ash and pozzolans: ASTM C-618.

E. Coarse aggregate: Not less than 50% clean, hard, crushed stone conforming to requirements of Table 2, size number 467 ASTM C-33.

F. Slump Range: 2-4 inches - tested according to ASTM designation C-143 (AASHTO-T119).

G. Air content: 5% ± 1%.

H. Mix proportioning:

1. 28 day compressive strength of cured laboratory samples 3,000 psi.

2. Minimum cement content 5 sacks/cubic yard.

I. Calcium Chloride: The use of calcium chloride or admixtures containing more than 0.05% chloride ions is prohibited.

J. Curing Materials:

1. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry;

2. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet;

3. Water: Potable;

4. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete;

5. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B;

6. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B;

7. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.

K. Mixes:

1. ASTM C-94.

2. Mix concrete only in quantities for immediate use.

3. Do not retemper or use set concrete.

2.05 CONCRETE MIXES AND MIXING

A. Concrete Mixes: Prepare design mixes, proportioned according to ACI 211.1R-91 and ACI 304, with the following properties:

1. Compressive Strength (28 Days): 3,000 psi;

B. Coloring Agent: When required, add coloring agent to mix according to manufacturer's written instructions.

1. Expansion and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork; and,

2. Coloring Agent: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.

C. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94 and ASTM C 1116.

D. Project-Site Mixing: On-site mixing must be approved by the OWNER. Comply with requirements and measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

2.06 REINFORCEMENT

A. Reinforcing Steel Bars: 60 ksi yield strength; deformed billet steel bars; ASTM A-615, plain finish.

B. Welded Steel Wire Fabric: Plain type, ASTM A-185, hot dip galvanized, plain finish.

C. Tie Wire: FS QQ-W-461-G, annealed steel, black, 16 ga. minimum.

D. Bar Supports: Conform to "Bar Support Specifications," CRSI Manual of Standard Practice.

2.07 FORMWORK AND ACCESSORIES

A. Formwork: Matched, tight fitting and adequately stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of concrete, conform with ACU 347, Chapter 3, Material and Form Work.

B. Lumber:

1. Softwood framing lumber: Kiln dried, PS-20.

2. Boards less than 1-1/2 inch thick and 2 inches wide, used for basic forms and form liners: Kiln dried.

3. Grade marked by grading rules agency approved by American Lumber Standards Committee.

4. Light framing or studs for board or plywood forms, 2 inches to 4 inches width and thickness, construction standard grade.

5. Boards for basic forms, construction standard grade.

6. Board surface: Smooth.

C. Plywood:

1. Exterior type softwood plywood, PS 1-66.

2. Each panel stamped or branded indicating veneer grades, species, type and identification.

3. Wood faced plywood for Architectural concrete surfaces.

a. Panel veneer grades: B-C.

b. Mill-oiled sides and mill-sealed edges of panels.

D. Ties:

1. Material: Steel

2. Type: Snap ties

3. Depth of breakback: 1 in.

4. Maximum diameter, 1/4 in.

E. Form coatings:

1. Non-staining type.

2. Agent: Pine oil derivative.

2.08 ISOLATION AND CONTRACTION JOINTS

A. Minimum 3/4 inch thick asphaltic impregnated fiberboard as per ASTM D-1751.

2.09 JOINTS, FILLERS, AND SEALANTS

A. Joint-Sealant Backer Materials: ASTM D5249, Non-Staining, compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.

B. Joint Sealant: Non-priming, pourable self-leveling silicone sealant for concrete and asphalt.

1. Cold-Applied Joint Sealant ASTM D5893, self leveling silicone sealant. Crafco Inc. "Roadwaver Silicone-SL"; Dow Corning "888, or 890-SL"; Sonneborn "Sonomeric 1 Sealant"; Tremco "Vulkem 45"; or approved equal and,

2. Hot-Applied Joint Sealant: ASTM D3405, Polymeric sealant. Crafco Inc. "ROADSAVER 22"; W.R. Meadows, Inc. "SEALTIGHT HI-SPEC", or approved equal.

C. Joint Fillers: Resilient pre-molded bituminous impregnated fiberboard units complying with ASTM D 1751, asphalt-saturated cellulosic fiber, ASSHTO M 153, Type I: or ASTM D 1752, cork or self-expanding cork.

D. Exterior Concrete Sealant: Sonneborn "Kure-N-Seal 30" exterior acrylic sealer, or Euclid "Super Rez-Seal", or approved equal.

PART 3 - EXECUTION

3.01 BARRICADES

A. Provide substantial temporary barricades around all areas of operation and maintain until work under this section is completed and approved.

B. Install temporary traffic markers, signals, and signs as per D.O.T. Standard Specifications to:

1. Eliminate potentially hazardous conditions.

2. Maintain adequate traffic patterns free of conflict with work under this Contract.

3.02 PREPARATION OF SUBGRADE

A. Ensure rough grading has brought subgrade to required elevations.

B. Fill soft spots and hollows with additional fill.

C. Level and compact subgrade, to receive limerock base for concrete walks, curbs and gutters, to 98% compaction as per AASHTO T-180.

3.03 FORMWORK

A. CONTRACTOR is responsible for the design, construction, removal and complete safety of formwork and shoring.

B. Form construction shall be provided to shape, lines dimensions of members shown: substantial, tight enough to prevent leakage, and properly braced or tied to maintain position and size, form sides and bottoms of members unless specifically excepted.

C. Fill voids of plywood joints with sealant and tool smooth.

D. Form vertical surfaces to full depth and securely position to required lines and levels. Ensure form ties are not placed so as to pass through concrete.

E. Arrange and assemble formwork to permit easy dismantling and stripping, and to prevent damage to concrete during formwork removal.

F. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations.

1. Maintain sufficient quantity of forms to allow continuance of work so that forms remain in place a minimum of 24 hours after concrete placement;

2. Forms shall be cleaned and casted with form release agent thoroughly after each use and before concrete is placed; and,

3. Flexible or curved forms shall be used on curves. Forms shall be of full depth of the concrete and of a strength when staked, sufficient to resist the presence of the concrete and the loads resulting from the finish operations without springing, setting or losing their shape.

3.04 REINFORCING

A. Reinforce concrete curbs and gutters. Allow for minimum 1-1/2 inch concrete cover.

B. Do not extend reinforcing through expansion and contraction of joints. Provide dowelled joints through expansion and contraction joints, with one end of dowels fitted with capping sleeve to allow free movement.

3.05 FORMING EXPANSION AND CONTRACTION JOINTS

A. Construct pre-molded expansion and contraction joints, tied construction joints, thickened edge expansion joints, isolation joints, and construction joints, straight with face perpendicular to concrete surface. Construct transverse joints perpendicular to centerline unless otherwise detailed.

1. Expansion joints and contraction joints, pre-molded as indicated on the drawings:

   a. Provide joint filler for the entire depth of the slab section and not less than 1 inch below finished surface so as to allow for joint sealer.

   b. Provide thickened edge expansion joint as indicated on the drawings.

   c. Provide 1/2 inch contraction joints for curb and gutter at 10 feet on center.

   d. Provide 1/2 inch expansion joints for curb and gutter and sidewalk at 100 feet on center.

2. Tied construction joints: As indicated on drawings;

3. Control joints: Depth shall be equal to ¼ of the concrete thickness or 1 inch, whichever is deeper. For sidewalks, control joint spacing shall be equal to the sidewalk width. For concrete pavement, control joint spacing shall be placed as shown on the drawings, no greater than 15 feet on center either way;

   a. Form tooled joints in fresh concrete by grooving top portion with recommended tool and finishing edges with jointer.

   b. Form sawed joints using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete within 24 hours of the concrete placement and as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.

4. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for period of more than ½ hour, except where such placements terminate at expansion joints. Construct joints using standard metal keyway-section forms or as shown on the drawings;

5. Isolation Joints: Locate isolation joints as indicated on the drawings. Provide premolded joint filler for isolation joints abutting site lighting poles, concrete curbs, catch basins, maintenance access structures, inlets, structures, walks and other fixed objects;

6. Joint Fillers: Extend joint fillers full-width and depth of joint, and not less than ½ inch or more than 1 inch below finished surface where joint sealer is indicated. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together; and,

7. Joint Sealants: All joints shall be sealed with approved exterior pavement joint sealants and shall be installed per manufacturer's recommendations.

3.06 INSPECTION

A. Assure that excavation and formwork are completed, and excess water is removed.

B. Check that reinforcement is secured in place.

C. Verify that expansion joint material, anchors, and other embedded items are secured in position.

3.07 PREPARATION FOR PLACEMENT

A. Notify the ENGINEER and other inspectors at least 36 hours prior to inspection.

B. Equipment forms, and reinforcing shall be clean and wet down, reinforcing firmly secured in place, runways set up and not resting on or displacing reinforcing.

3.08 PLACING CONCRETE

A. Concrete Placement: Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete. Place concrete in a continuous operation within planned joints or sections.

1. Moisten subbase to provide a uniform dampened condition at time concrete is placed;

2. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping according to recommendations in ACI 309R;

3. Screed and initial-float concrete surfaces with darby or bull float before excess moisture or bleed water appears on the surface;

4. Protect concrete from cold or hot weather during mixing, placing, and curing; and,

5. All concrete walks and aprons shall be a minimum of 4 inches thick as shown on the drawings, with a turned down edge as detailed.

B. Evaporation Retarder: Apply to concrete surfaces if hot, dry, or windy conditions exist. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Pavement Tolerances: Comply with tolerances in ACI 330.1, Specification for Plain Concrete Parking Lots.

D. Place concrete, screed and wood float surfaces to a smooth and uniform finish, free of open texturing and exposed aggregate.

E. Avoid working mortar to surface.

F. Round all edges, including edges of expansion and contraction joints, with 1/2 inch of radius edging tool.

G. Where concrete curbs are adjacent to pavement slabs, make concrete curbs and gutters integral with slabs. Make expansion and contraction joints of curbs coincide with slab joints.

H. Ensure finished surfaces do not vary from true lines, levels or grade by more than 1/8 inch in 10 feet when measured with straightedge.

I. Apply curing compound on finished surfaces immediately after finishing. Apply in accordance with manufacturer's recommendations.

3.09 FINISHES AND CURING

A. All exterior concrete shall receive a medium broom finish.

B. Curing: Begin curing after finishing concrete, but not before free water has disappeared from concrete surface. Cure concrete by one or a combination of the following methods:

1. Moisture cure concrete by water, continuous fog spray, continuously wet absorptive cover, or by moisture-retaining-cover curing. Keep surfaces continuously moist for not less than 7 days; and,

2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

C. All exterior concrete surface shall receive one coat of exterior sealer.

3.10 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.

B. Protect concrete from damage. Provide adequate traffic control to prevent traffic from pavement for at least 14 days after placement.

C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than 2 days before date scheduled for substantial completion inspections.

D. Protection of Completed Work: During curing period, protect concrete from damaging mechanical disturbances, water flow, loading, shock, and vibration.

3.11 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

B. ACI Publications: Comply with ACI 301R-99 and ACI330R-92, unless modified by the requirements of the Contract Documents.

C. The OWNER shall provide and pay for testing services. A slump test and air test shall be performed for each load delivered. Four standard test cylinders shall be taken for each 55 cubic yards of concrete or each days pour, whichever is more frequent. Two cylinders shall be broken at 7 days and two cylinders shall be broken at 28 days.

3.12 CLEAN UP

A. Remove all debris and excess material immediately from project site.

B. Take down all barricades and temporary traffic markers, signals and signs only after all work included in this section is finished and inspected, and only after so directed by OWNER or ENGINEER.

C. Leave project area neat, orderly and free of any hazardous conditions.

END OF SECTION 02751

SECTION 02752

TELEVISION SURVEY

PART 1 - GENERAL

1.01 SCOPE

A. The work consists of furnishing all labor, materials, accessories, equipment, tools, transportation, services and technical competence for performing all operations required to execute the internal closed circuit television survey to inspect the entire barrel of sewers up to 30 inches in diameter.

B. The survey shall show all defects and determine amount of infiltration entering the sewer system.

1.02 GENERAL

A. After cleaning the pipe sections shall be visually surveyed by means of closed-circuit television in the presence of the CITY. The survey shall be performed one manhole-to-manhole section at a time.

B. Post-construction survey video on CD-ROM shall be delivered to the CITY on a "one line per CD-ROM" basis, accompanied with the corresponding work order, and post-TV log, for each sewer line surveyed. The video on CD-ROM shall be direct from a live video source into a video file, format Win Can, and of good quality for viewing. Video tapes shall not be accepted.

C. The television equipment operator shall be certified under the NASSCO (National Association of Sewer Survey Companies) PACP (Pipe Line Assessment and Certification Program).

1.03 SOFTWARE

A. The CITY plans to utilize a computer-based inspection software to facilitate the complex task of acquiring accurate and detailed field-inspection information. For this and future contracts the CITY has updated its data collection and data format specifications. The data collection software purchased and utilized by the CITY is WinCan™. All inspection information furnished by the CONTRACTOR shall be written to digital media and shall be submitted in printed hard copy and electronic data format utilizing WinCan™. The WinCan™ software shall support the NASSCO PACP coding. The WinCan™ system consists of an integrated proprietary software application designed for pipe inspection reporting, DVD/CD control video picture, mini-movie capture and full length (manhole to manhole) capture of underground utilities. The CITY will not accept data gathered utilizing other format. These records shall include, but not be limited to the following: Manhole reports, inclination reporting, inspection reports, lateral reports, and infiltration reports.

WinCan America Inc., can be contacted at 1730 Montano Road NW, Suite E, Albuquerque, NM 87107, Phone: (505) 341-0109.

1.04 EQUIPMENT

A. The television camera used for the survey shall be one specifically designed and constructed for such survey and shall be of the pan and tilt type. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing a minimum 700 line resolution color video picture. The CONTRACTOR shall maintain camera in clear focus at all times. Picture quality and definition shall be to the satisfaction of the CITY; and if unsatisfactory, equipment shall be removed and replaced with adequate equipment at no additional cost to the CITY.

B. The video camera shall include a titler feature capable of showing on the tape the following information:

1. City and State

2. Date/Time

3. CONTRACTOR's Name

4. Line Size, Material, and Depth

5. Manhole Identification (both manholes)

6. On-going Footage Counter

1.05 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings and other information in accordance with Section 01340 - Submittals. The CONTRACTOR's submittals shall include description of the software to be used and a sample of the video titles to be used, along with a sample of the television survey log to be used.

PART 2 - PRODUCTS

All inspection information and data (including video) written to digital media (CD-ROM).

PART 3 - EXECUTION

3.01 POST CONSTRUCTION SURVEY

A. Procedure

1. All sewer line(s) (from manhole to manhole) shall be televised. The camera shall be placed at the center of the manhole and videotaping shall commence prior to entering the pipe. The CONTRACTOR shall show the inside of the manhole walls and the pipe connection to the wall at both the upstream and downstream manhole.

2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case shall the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, powered rewinds and tractors or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If the camera is being pulled through the sewer line by a hydraulic cleaning unit hose the cleaning nozzle shall be located a minimum of eight (8) feet away from the camera to allow a clear, unobstructed view. Jet nozzle shall be used in front of camera while televising through a dip to draft out water. If, during the survey operation, the television camera will not pass through the entire manhole section, the CONTRACTOR shall set up his equipment so that the survey can be performed from the opposite manhole.

3. Whenever non-remote powered and controlled winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two manholes of the section being surveyed to insure good communications between members of the crew.

4. Measurement for location of defects shall be above ground by means of a meter device. Marking on the cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Measurement meters shall be accurate to tenths of a foot over the length of the section being surveyed. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, electronic distance meter or other suitable device. Manhole numbers and linear footage shall be shown on screen during taping.

5. Movement of the television camera shall be temporarily halted for a minimum of ten seconds at each visible point source of infiltration and/or inflow until the leakage rate from that source is quantified. The camera shall be stopped at all service connections and the service lateral shall be inspected with the pan and tilt camera. The camera shall also be stopped at active service connections where flow is discharging. If the discharge persists, the property involved shall be checked to determine whether or not the discharge is sewage. If no flows are being discharged from the building, it shall be considered that the observed flow is infiltration/inflow.

B. Field Documentation

1. Television Inspection Forms (Survey Logs). Printed and electronically stored location records shall be kept by the CONTRACTOR and will clearly show the location in relation to an adjacent manhole of each infiltration point observed during survey. Upstream footage at face of manhole (0) and downstream footage at face of manhole (e.g., 250) shall be shown on the log. The television inspection forms to be utilized by the CONTRACTOR shall be those mandated by NASSCO's PACP. Both the "Header" and "Details" information of the form shall be entered as indicated in the PACP standards. The survey logs shall include, but not be limited to the following information:

   a. Correct pipe segment/manhole numbers

   b. Correct address of manhole location

   c. Pipe size, length and material

   d. Manhole depth (up and downstream)

   e. Lift station service area number

   f. CD number and index

   g. Footage locations, descriptions and estimated leak rates for visible point sources of infiltration inflow

   h. Footage locations and descriptions of structural defects such as obstructions, any remaining root intrusion, offset joints, cracked pipe, fractured pipe, holes, collapses, sags, protruding service connections and/or blockages in the pipe.

   The terminology to be used shall follow NASSCO's PACP standards. All information will be recorded and a copy of such electronic records and a hard copy will be supplied to the CITY. Manhole identification shall begin with the Lift Station service area number (example B1, C1, D1, etc.), followed by the 3-digit manhole number.

2. Photographs. Digital photographs of the television picture of problems shall be taken by the CONTRACTOR upon request of the CITY.

3. Video Recordings. The purpose of video (CD-ROM) recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. CD-ROM recording playback shall be at the same speed that it was recorded. Slow motion or stop motion playback features shall be supplied by the CONTRACTOR. Once recorded, the CD-ROM becomes property of the CITY. The CONTRACTOR

shall have all CD-ROM and necessary playback equipment readily accessible for review by the CITY during the Project.

The observation terminology utilized during audio narration shall be consistent with NASSCO's PACP standards. The television inspection shall be video recorded on high quality CD-W. All video burning shall be performed using the Win Can™ system. The CD shall be clearly labeled with the lift station number and individual manhole numbers clearly listed. The CDs are to be furnished to the CITY with a printed hard copy (Survey Logs) and electronic data inspection report.

Video CDs displaying poor video quality will be deemed unacceptable and no payments will be made until lines are retelevised and a new CD is submitted. Poor video quality refers to, but is not limited to, the following: grease or debris on the lens, camera under water, picture too dark, excessive camera speed through the line, lines improperly cleaned, poor/no audio, etc.

4. Audio. All CD-ROM shall have audio record. As a preamble, at the beginning of the CD-ROM, the CONTRACTOR shall state the following: "(Contractor's Name) is performing a pre/post TV survey for Job No. 1609, City of Lake Worth". State date, time, operator's name, area, upstream manhole number to downstream manhole number, pipe size and material, upstream manhole depth, and TV survey will be from up- to downstream, or down- to upstream. The CONTRACTOR shall verbally state station and position of all laterals and defects. At the end of each line, state: "End of line", upstream manhole number to downstream manhole number, and total linear footage. Manhole identification shall begin with the Lift Station service area number (example B1, C1, D1, etc.), followed by the 3-digit manhole number.

END OF SECTION 02752

SECTION 02761

PAVEMENT MARKING AND CAR STOPS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 WORK INCLUDED

A. The work covered by this section shall include the furnishing of all labor, equipment and materials necessary to construct and install all existing pavement markings and striping damaged during construction, in accordance with these specifications.

1.03 RELATED WORK

A. Section 02741 - Asphaltic Concrete Paving - General.

B. Section 02751 - Portland Cement Concrete Paving.

1.04 PROJECT CONDITIONS

A. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 degrees F for oil base materials, 50 degrees F for water-based materials, and not exceeding 90 degrees F.

B. Surface Preparation: The surface shall be clean and free of dirt, grease, oil, or other contaminants which could interfere with adhesion.

1.05 QUALITY ASSURANCE

A. Perform all work in accordance with the requirements of local agencies.

PART 2 - PRODUCTS

2.01 Chlorinated rubber-alkyd type, as per Fed Spec. No. TT-P-115, Type III, or shall be Code T-1, conforming to Section 971-12.2 of the Florida Department of Transportation Standard Specifications.

A. Paint shall be factory mixed, quick drying and non-bleeding type.

B. Color shall be as per D.O.T. requirements.

C. Striping, arrows, lane markers and stop bars shall be provided with paint containing reflective additive.

2.02 Thermoplastic paint shall conform to the applicable Technical Specifications (Section 711) of the Florida Department of Transportation, City of Lake Worth, and Palm Beach County Standards.

2.03 Traffic paint shall conform to the applicable Technical Specifications (Section 710) of the Florida Department of Transportation, City of Lake Worth, and Palm Beach County Standards.

2.04 Reflectors shall be in accordance with City of Lake Worth and Palm Beach County Minimum Standards.

PART 3 - EXECUTION

3.01 TRAFFIC AND LANE MARKINGS

A. Sweep dust and loose material from the sealed surface.

B. Apply paint striping as indicated on the drawings, with suitable mechanical equipment to produce uniform straight edges.

1. Apply in not less than (2) two coats as per manufacturer's recommended rates of applications.

C. Protect pavement markings until completely dry in accordance with manufacturers recommendations.

3.02 TEMPORARY PAVEMENT MARKINGS

A. Temporary paint shall be applied in accordance with permanent pavement marking specifications. However, only 1 coat of paint shall be required to a clean, dry surface using template or a striping machine. The CONTRACTOR may also propose to utilize temporary/removable pavement marking tape, as approved by the OWNER.

B. Markings shall be applied using butyl adhesive pads or paint to clean dry pavement surfaces which are free of cracking, checking, spalling, or failure of underlying base material.

C. When required, removable marking tape or pavement marking paint shall be applied on clean dry surfaces at designated locations. Tape that has become damaged and is no longer serviceable shall be replaced without additional compensation.

D. All temporary markings and striping shall be removed when no longer required. Any pavement area that has been determined to be damaged as a result of the removal operation shall be repaired at no cost to the OWNER.

3.03 PAVEMENT MARKING REMOVAL

A. Existing pavement marking lines and symbols shall be removed as to not materially or structurally damage the surface or texture of the pavement. A motorized abrasive device shall be utilized to remove existing markings. The CONTRACTOR shall repair any damage to the pavement at no expense to the OWNER. The pavement surface shall be left in a condition that will not mislead or misdirect customers or motorists. Pavement marking removal within public rights of way shall be completed in accordance with the regulatory authority having jurisdiction and the specifications.

END OF SECTION 02761

SECTION 02775

CONCRETE SIDEWALK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 WORK INCLUDED

A. The work specified in this Section consists of the construction of concrete sidewalk damaged during construction, in accordance with these Specifications and the requirements of the owner in conformity with the lines, grades and dimensions of the existing sidewalk.

1.03 RELATED WORK

A. Section 02300 - Earthwork.

B. Section 02230 - Site Clearing.

C. Section 02751 - Portland Cement Concrete Paving.

D. Section 03050 - Concrete.

PART 2 - PRODUCTS

2.01 CONCRETE

A. Concrete shall be Class I Concrete, with a minimum compressive strength of 3,000 psi in accordance with Section 345, Florida Department of Transportation Standard Specifications for Road and Bridge Construction. Minimum concrete sidewalk thickness shall be 6”.

2.02 FORMS

A. Forms for this work shall be made of either wood or metal and shall have a depth equal to the plan dimensions for the depth of concrete being deposited against them. They shall be straight, free from warp or bends, and of sufficient strength when staked, to resist the lateral pressure of the concrete without displacement from lines and grade. Forms shall be cleaned each time they are used and shall be oiled prior to placing the concrete.

2.03 SUBGRADE AND GRADING

A. Excavation shall be made to the required depth, and the foundation material upon which the sidewalk is to be set shall be compacted to a firm, even surface, true to grade and cross-section, and shall be moist at the time that the concrete is placed.

2.04 JOINTS

A. Expansion joints between the sidewalk and the curb, and at all other locations indicated on the plans, shall be 1/4-inch wide, formed with a preformed joint filler. Preformed joint filler shall meet the requirements of AASHTO M153 or AASHTO M213.

B. Contraction joints may be of the open type or may be sawed. Open type contraction joints shall be formed by staking a metal bulkhead in place and depositing the concrete on both sides. After the concrete has set sufficiently to preserve the width and shape of the joint, the bulkhead shall be removed. After the sidewalk has been finished over the joint, the slot shall be edged with a tool having a 1/2-inch radius.

If the CONTRACTOR elects to saw the contraction joints, a slot approximately 1/8 inch wide and not less than 1-1/2 inches deep shall be cut with a concrete saw after the concrete has set, and within the following periods of time:

Contraction joints shall be constructed at not more than 20-foot intervals, and shall be in place within 12 hours after finishing.

2.05 ADA DETECTABLE WARNINGS

A. Detectable warnings shall be installed at all locations where required, compliant with ADA guidelines.

PART 3 - EXECUTION

3.01 PLACING

A. The concrete shall be placed in the forms to the required depth and shall be vibrated and spaded until mortar entirely covers its surface.

3.02 FINISHING

A. Screeding: The concrete shall be struck-off by means of a wood or metal screed, used perpendicular to the forms, and floated in order to obtain the required grade and remove surplus water and laitance.

B. Surface requirements: The concrete shall be given a broom finish. The surface variations shall not be more than 1/4 inch under a ten-foot straightedge, nor more than 1/8 inch on a five-foot transverse section. The exposed edge of the slab shall be carefully finished with an edging tool having a radius of 1-1/2 inch.

3.03 CURING

A. The concrete shall be continuously cured for a period of at least 72 hours. Curing shall be commenced after finishing has been completed and as soon as the concrete has hardened sufficiently, to permit application of the curing material without marring the surface.

B. Wet burlap, white-pigmented curing compound, waterproof paper or polyethylene sheets may be used for the curing.

C. CONTRACTOR shall protect against graffiti and other damages to the finish, prior to curing and acceptance.

D. No sidewalk installed by the CONTRACTOR with visible cracks will be accepted by the OWNER. Cracked sidewalk shall be removed, disposed of and replaced by the CONTRACTOR at no cost to the OWNER. Cracked sidewalk replacement shall consist of a minimum of one flag (5') of sidewalk.

END OF SECTION 02775

SECTION 02810

UNDERGROUND IRRIGATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Pipe and fittings, valves, sprinkler heads and accessories; and,

2. Irrigation control system.

1.03 WORK INCLUDED

A. The work is to include the furnishing of all labor, supplies, equipment and materials necessary to complete the installation of the pipe and fittings, valves, and sprinkler heads, controller, etc as shown on the Drawings as well as all other related responsibilities described in these Specifications and accompanying Plans.

B. The system is a fully automatic system comprised of zones operated by the controller. This system has been designed to provide 100% coverage. It is the responsibility of the Contractor to ensure the entire system is installed according to applicable laws, rules, regulations and conventions.

1.04 RELATED WORK

A. Section 02230 - Site Clearing

B. Section 02300 - Earthwork

C. Section 02305 - Excavation and Backfilling for Utilities

D. Section 02502 - Valves General

E. Section 02900 - Landscape Work

1.05 REFERENCE STANDARDS

A. American Society of Testing and Materials

1. ANSI/ASTM D2282 - Acrylonitrile-Butadiene-Styrene (ABS) Plastic pipe (SDR-PR);

2. ANSI/ASTM D2564 - Solvent Cement for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings;

3. ASTM B32 - Solder Metal;

4. ASTM B42 - Seamless Copper Pipe, Standard Sizes;

5. ASTM B88 - Seamless Copper Water Tube;

6. ASTM D1784 - Rigid and Chlorinated Polyvinyl Compounds

7. ATSM D2235 - Solvent Cement for Acrylonitrile - Butadiene - Styrene (ABS) Plastic Pipe and Fittings;

8. ASTM D2466 - Polyvinyl Plastic Pipe Fittings, Schedule 40; and,

9. ASTM D2467 - Polyvinyl Plastic Pipe Fittings, Schedule 80.

B. FS O-F-506 - Flux, Soldering; Paste and Liquid.

C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.06 QUALITY ASSURANCE

A. Responsibility for Assuring Quality Work:

1. The CONTRACTOR's Superintendent shall be well versed in standard plumbing procedures, PVC assembly procedures, blueprint reading and coordination with other contracts or services in the project area.

2. All employees shall be competent and highly skilled in their particular job in order to properly perform the work assigned to them. The CONTRACTOR shall be responsible for maintaining the quality of material on the job throughout the duration of his responsibility.

B. Requirements of Regulatory Agencies:

1. All work and materials shall be in full accordance with the latest rules and regulations of safety order of Division of Industrial Safety; the Florida Building Code, the Uniform Building Code and other applicable laws and regulations, including any regulatory authorities having jurisdiction, and Plumbing Codes; and,

2. Should the contract documents be at variance with the aforementioned rules and regulations, notify the OWNER for instructions before proceeding with work affected.

C. Testing:

1. Preliminary inspection of completed installation will be made prior to backfilling of trenches and during hydrostatic testing; and,

2. Final inspection shall be made in conjunction with the final inspection of lawn, shrub and tree planting.

D. Permits and Inspections:

1. Any permits for the installation or construction of any work included under this contract, which are required by any of the legally constituted authorities having jurisdiction, shall be obtained and paid for by the CONTRACTOR, each at the proper time; and,

2. The CONTRACTOR shall also arrange for and pay all costs in connection with any inspection and examination required by these authorities.

1.07 SUBMITTALS

A. Shop drawing or irrigation system design, including but not limited to piping, sprinkler heads, valves, wiring, and controls, if not provided in drawings.

B. CONTRACTOR shall furnish 2 manufacturer's service manuals to the OWNER. Manuals may be loose-leaf and shall contain complete drawings of all equipment installed showing components and catalog numbers together with the manufacturer's name and address.

C. Loose equipment to furnish: Loose irrigation equipment, operating keys and spare parts if shown on the drawings.

1. 3 quick coupler keys and matching swivel hose cells;

2. 2 valve keys for gate valves;

3. 2 keys for each controller;

4. 2 sets of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this project; and,

5. 2 cover lifting tools for valve boxes.

D. Record Drawings:

The CONTRACTOR shall maintain one record set of blue-line prints of the irrigation system in good condition at the site and mark on them the exact 'record'. The CONTRACTOR shall make a daily record of all work installed during each day. Drawings shall indicate the exact location of check valves, gate valves, wire locations, head layout, automatic valves, quick couplers, irrigation, drainage piping, etc. Locations should be shown by the triangular system of measurements from easily identified permanent features, such as buildings, curbs, fences, walks, and by GPS, etc. Drawings shall show approved substitutions if any, of material including manufacturer's name and catalogue number. Drawings shall be to scale and all information shall be recorded in a neat, orderly way.

1. At the time of the irrigation mainline test, the CONTRACTOR shall provide a preliminary set of 'Record' drawings to the OWNER; and,

2. On or before the date of substantial inspection, the CONTRACTOR shall deliver 2 sets of As-Built drawings to the OWNER. The delivery of the prints shall not relieve the CONTRACTOR of the responsibility of furnishing required information that may have been omitted.

3. Immediately upon installation of any work which deviates from what is shown on the prints, the CONTRACTOR shall clearly indicate such changes in red pencil on the prints. Such changes shall include, but not be limited to, changes in (1) material, (2) sizes of material, (3) location, and (4) quantities. Dimensions shall be used where required such as, but not limited to underground utilities.

G. Substitutions:

1. The CONTRACTOR shall use materials as specified herein. Material other than that specified will be permitted only after written application by CONTRACTOR and written approval by the OWNER;

2. Substitutions will only be allowed when in the best interest of the OWNER; and,

3. The installation of any approved substitution is the CONTRACTOR's responsibility. Any changes required for installation of any approved substitution must be made to the satisfaction of the OWNER and without additional cost to the OWNER.

1.08 LOCATION

A. Bidders shall personally examine the sites and fully acquaint themselves with all of the existing conditions in order that no misunderstanding may afterwards arise as to the character or as to the extent of the work to be done; and, likewise, in order to advise and acquaint themselves with all precautions to be taken in order to avoid injury to persons or property of another. No additional compensation will be granted because of any unusual difficulties which may be encountered in the execution or maintenance of any portion of the work.

PART 2 - MATERIALS

2.00 All materials to be as specified below or approved equal.

2.01 PIPE

A. Pipe locations shown on the plan are schematic and shall be adjusted in field.

B. All PVC pipe shall be new and free from defects and shall be continuously marked indicating size, schedule, type and Department of Commerce Standard Reference. Pipe shall be furnished in standard length of 20 feet.

C. Main: Main line shall be solvent weld schedule 40 PVC pipe sized as noted on plans.

D. Laterals: All lateral pipes shall be Polyvinyl Chloride (PVC) 1120-1120, Class 200. Threaded connections shall be schedule 80 unless noted otherwise on the Plans or Specifications.

E. Galvanized Steel Pipe: All pressure mains which are exposed to possible damage, such as above ground, shall be threaded end, standard weight, Schedule 40 galvanized or coated steel.

F. Sleeves: All sleeves to be Polyvinyl Chloride (PVC) Schedule 40 and sized as twice the size of the pipe it is carrying.

G. Chaseways: All chaseways shall be PVC Schedule 40 and sized as needed for present and future use.

2.02 PIPE FITTINGS AND JOINTS

A. All PVC lateral pipe shall have PVC solvent weld Schedule 40 fittings and joints. The primer and solvent glue shall be compatible with the pipe and fittings. No male threaded PVC fittings are to be used, with the exception of street ells and riser adapters.

B. Galvanized steel pipe shall have threaded standard, 150 pound galvanized malleable fittings. All sprinkler heads shall be connected to the supply line with flexible pipe and ells, (Rainbird flex pipe and barbed ells O.A.F.) or Schedule 80 swing joints as shown on the details.

C. Main line pipe joints shall be "belled" solvent-weld type.

2.03 SPRINKLER HEADS

A. Shrub heads and bubblers shall be installed on 1/2" schedule 40 PVC risers. Paint all risers with black paint. Shrub heads shall be installed to a standard height of 6" above plants, and shall be installed within planted masses to be less visible. Bubblers shall be installed at the base of trees for low level watering.

B. All pop-up heads shall be mounted on flexible type swing joints.

C. All pop up and shrub heads shall be pressure compensating.

D. Use screens in all heads.

2.04 IRRIGATION CONTROL WIRE

A. If necessary, all irrigation control wire from the controller to the electric valve shall be UL approved PE irrigation control wire, single conductor insulated utilizing low density high molecular weight polyethylene insulation suitable for operating at 600 volts and conductor temperatures up to 60° C. The conductor shall be soft drawn bare copper meeting the requirements of ASTM Specification B-3 or B-8. Temperature rating shall be from –55° to +60° C. Thickness of insulation for conductor size 14 AWG through 12 AWG solid shall be 3/64 inches. Wire size, number and color as follows: #12 White for Common; #14 Red for Hotwires; #14 Yellow for Spares.

2.05 WIRE CONNECTORS

A. All splices in irrigation control wire shall be accomplished by using 3M Dry Direct Bury Splice Kit or approved equal.

2.06 SLEEVING AND CONDUIT

A. Sleeving and conduit shall be PVC, Schedule 40 for pipe sizes through 3 inches, and Class 160 for sizes 4 inches diameter or greater. Size as required by code or as shown on the Plan, whichever is larger in size. Electric conduit shall be gray PVC with Underwriters' Laboratories label.

2.07 RISERS

A. Risers to be Schedule 40 NPT riser threshold, height to be determined by use.

2.08 AUTOMATIC CONTROL VALVES

A. Utilize the automatic valves that are noted on the plans or if not noted use Rainbird ESP series or approved equal.

2.09 GATE VALVES & ISOLATION VALVES

A. Gate valves 3 inches and smaller shall be NIBCO T-113 (screwed end) with all bronze body, wedge disc and non-rising stem, or approved equal.

B. Isolation valves shall be iron body resilient seat gate valves with modified wedge disc NRS type, with slip on joint ends installed with thrust blocks.

2.10 VALVE BOXES

A. Valve boxes shall be made of molded plastic as manufactured by Carson Industries or approved equal. Boxes shall be 9 in. x 9 in. x 6 in. and green with a green cover marked "Irrigation" on top.

2.11 PAINT FOR RISERS

A. All risers to be painted black.

2.12 CONTROLLER

A. Controller shall be Solatrol Inc.- LEIT 8000 or approved equal with stainless steel enclosure as specified on Contract Documents.

2.13 VACUUM BREAKER

A. Vacuum breaker shall be FEBCO 765Y or approved equal.

PART 3 - EXECUTION

3.01 GENERAL

A. The Irrigation Contractor shall carefully schedule his work with the Landscape Contractor and all other site developments.

B. Sleeves are required wherever piping or electrical wires are placed under paved surfaces. Install sleeves prior to commencement of paving.

C. No consideration will be given to any design changes. Should any changes be deemed necessary after award of contract, for proper installation and operation of the system, the OWNER shall negotiate such changes.

D. Lay out work as accurately as possible to the submitted shop drawings.

E. Full and complete coverage is required. CONTRACTOR shall make any necessary minor adjustments to layout as required to achieve full coverage of irrigated areas at no additional cost to the OWNER.

F. Where piping is shown on drawings to be under paved areas but running parallel and adjacent to planted areas, the intent is to install piping in planted areas. Do not install directly over another line in same trench.

G. It shall be the CONTRACTOR's responsibility to establish the location of all sprinkler heads in order to assure proper coverage of all areas. In no case shall spacing of sprinkler head exceed distances shown on the drawings and/or those specified. Pipe sizes shall conform to those shown on the drawings. No substitutions of smaller pipe sizes will be permitted, but substitutions of larger sizes may be approved. All pipe damaged or rejected because of defects shall be removed from the site at the time of said rejection, at not additional cost to the OWNER.

H. Install irrigation system after completion of site grading. The irrigation system shall be installed and completely operational three days prior to the installation of any planting operations.

3.02 PREPARATION

A. Layout of Main and Laterals: The sprinkler main lines and all laterals shall be laid out by the CONTRACTOR and approved by the OWNER or ENGINEER, prior to excavation. The sprinkler lines, as shown on the Plans, are drawn for clarity and are schematic in nature. No sprinkler lines shall be under paved areas unless in sleeves or specifically noted on the Plans. Any adjustment or site modification shall be done prior to the excavation operation.

B. Layout of Sprinkler Heads: All sprinkler heads locations shall be staked by the CONTRACTOR and approved by the OWNER or ENGINEER, prior to installation to ensure uniformity and correctness to both pattern and coverage.

C. Valve Locations: The location of all valves shall be in landscape areas. The location of all valves shall be staked by the CONTRACTOR and approved by the OWNER or ENGINEER, prior to installation to ensure ease of access for maintenance and to ensure that they do not conflict with other elements on the project. Each valve shall be installed in a separate valve box. The valve locations shown on the plan are drawn for clarity and are schematic in nature. Sequence all valves so that the farthest valve from the P.O.C. operates first and the closest to the P.O.C. operates last.

D. Valve boxes must be placed a minimum of 12 inches and a maximum of 15 inches from the edge of pavement and the top of the box shall be 2 inches above finish grade. Valve boxes to be installed in shrub beds only. Using 3 inches high number stencils, paint the valve number in white on the lid of each valve box.

E. Irrigation Plans: The irrigation system indicated on the drawings is drawn for clarity and is essentially diagrammatic. Spacing of the heads shown on the Plans shall not be modified unless approved in writing by the OWNER and ENGINEER.

3.03 TRENCHING

A. Perform all excavations as required for installation of work included under this Section, including shoring of earth banks, if necessary. Restore all surfaces, existing underground installation, etc., damaged or cut as a result of the excavations, to their original condition.

B. Should utilities not shown on the drawings be found during excavations, CONTRACTOR shall promptly notify the OWNER for instructions as to further action. Failure to do so will make the CONTRACTOR liable for any and all damage thereto arising from his operations subsequent to discovery of such utilities. Indicate such utility crossings on the record drawings promptly.

C. Trenches shall be open, vertical sided construction wide enough to provide free working space around work installed and to provide ample space for backfilling and compacting.

D. When 2 pipes are to be placed in the same trench, a 6 inch space is to be maintained between pipes. The CONTRACTOR shall not install 2 pipes with one directly above the other.

E. Backfill and compaction shall be in accordance with Section 02305, Excavation and Backfilling for Utilities. Depth of trenches shall be sufficient or provide a minimum cover above the top of the pipe as follows or as showing drawing if greater:

12 inches over non-pressure lateral lines
18 inches over non-pressure lateral lines under paving
18 inches over control wires
18 inches over sprinkler main line
24 inches over sprinkler main line under paving

F. The CONTRACTOR shall cut trenches for pipe to required grade lines and compact trench bottom to prove accurate grade and uniform bearing for the full length of the line.

G. All laterals and mainline shall be sufficiently sloped to provide positive drainage through drain valves.

H. The CONTRACTOR shall be held responsible for any damages caused by these operations and shall immediately repair or replace damaged parts.

3.04 INSTALLATION

A. Ground Level Areas: The CONTRACTOR shall do all necessary excavating and backfilling required for the proper installation of the work. Minimum depth of cover over lateral lines shall be 12 inches, over main line shall be 18 inches, over sleeves it shall be 24 inches. Backfill material shall be clean fill. If existing material has rock, then clean sand must be used. In rocky areas, the trenching depth shall be two inches below normal trench depth to allow for a 2 inch bed of sand below the pipe. There shall be no rock in contact with PVC pipe. The CONTRACTOR shall use backfilling equipment that will tamp backfill to its original density. He shall barricade or light the excavation to prevent hazards to the public. Objectionable materials such as coral rock, asphalt, limerock and bricks that are encountered during working operations shall be removed from the project by the CONTRACTOR.

B. Modifications Due to Field Conditions: Conditions that occur on the site that causes the system to be modified, shall be presented as shop drawings by the CONTRACTOR and approved by the ENGINEER, prior to construction.

C. The existence and location of utilities (overhead, above ground and underground) shall be thoroughly investigated and verified by the CONTRACTOR before the work begins in the area of said utilities. The CONTRACTOR shall exercise care in digging and working so as not to damage utilities or endanger the safety and lives of people. Should overhead, above ground or underground obstructions be encountered which interfere with the work, the ENGINEER shall be consulted in order for a decision to be made on the relocation of the work to clear such obstruction. The CONTRACTOR shall be responsible for the immediate repair of any damage to utilities caused by his work.

D. PVC Sleeves and Electrical Conduit

1. All PVC sleeves shall be a minimum of twice (2x) the diameter of the pipe to be sleeved; and,

2. All PVC control wire conduit shall be of sufficient size to hold the required quantity of control and common wires. Electrical wires are not to be placed in the same sleeve with water pipes.

3.05 PVC PIPE ASSEMBLY

A. All PVC pipe shall be cut to the proper length prior to assembly. The cut shall be neat and square, 90 degrees to the axis of the pipe. Prior to assembly, the cut end shall be de-burred. The fitting and pipe end shall both be cleaned with a PVC High Etch Primer. This primer shall have a purple tint to aid in visual inspection.

B. A thin even flow coat of slow drying, heavy duty PVC solvent/glue shall be applied to both the inside of the fitting and the pipe mating surface.

C. The pipe shall be inserted into the fitting until it bottoms, then given a quarter turn to ensure proper sealing. The pipe and fittings shall be out of service during the curing time as recommended by the manufacturer or 24 hours, whichever is longer. The finished joint shall be water-tight and shall have a strength equal to or greater than that of the pipe being joined. The direct tapping of PVC pipe or fittings shall not be permitted.

D. Threaded Joints for PVC Pipes

1. Use Teflon tape on all threaded PVC fittings;

2. Use strap-type friction wrench only. Do not use metal-jawed wrench; and,

3. At threaded joints between PVC and metal pipes, the metal shall contain the socket end and the PVC end shall contain the spigot. A metal spigot shall not, under any circumstances, be screwed into a PVC socket.

3.06 IRRIGATION CONTROL VALVES

A. Valves shall be carefully inspected during installation; they shall be opened wide and then tightly closed and tested for tightness. Special care shall be taken to prevent any foreign matter from becoming lodged in the valve seat. Valves shall be set plump at the locations indicated and in accordance with the details shown on the drawings.

B. Install control valves in valve boxes grouping together where practical. Place no closer than 12 inches to walk edges, buildings and walls.

C. Pressure regulating remote control valves shall be adjusted so that the most remote sprinkler heads operate at the pressure specified.

D. Valves shall be installed as shown in details and in accordance with manufacturer's instructions and the specifications.

3.07 QUICK COUPLING VALVES

A. Shall be set a minimum of 12 inches from walks, curbs or paved areas where applicable or as otherwise noted. Quick coupling valves shall be housed in valve boxes.

B. Valves shall be installed on 3 elbow PVC Schedule 80 swing joint assembly.

3.08 VALVE BOXES

A. Valve boxes shall be set flush with finish grade in lawn areas and ½ inch above finish grade in ground cover and shrub bed areas.

3.09 SPRINKLER HEADS

A. Sprinkler Heads: All sprinkler heads shall be installed as shown on the Drawings. Backfill around the sprinkler shall be free of rocks, roots, or debris. If finished grade has not been established, the line shall be temporarily capped at the head and a stake marker placed. After grading has been completed, the sprinkler head shall be set. The CONTRACTOR shall coordinate his operations with the various phases of the work. Adjust heads for proper coverage avoiding excess water on walks, walls and paving.

B. All sprinkler heads within a zone shall have matched precipitation rates.

C. All heads operating on one valve (zone) shall do so at the same pressure.

D. All heads shall be pop-up type heads. Permanent shrub risers are not permitted.

E. Do not mix different types of heads within zone.

F. Shrub beds and lawn areas are to be on separate valves (zones).

G. Place part-circle pop-up sprinkler heads 6 inches from edge of adjacent walks, curbs and mowing bands, or paved areas at time of installation.

H. All sprinkler nozzles shall be adjusted for the proper radius and direction of spray pattern. Make adjustments where possible to prevent over-spraying into walks, pavement or buildings.

I. Sprinkler heads and quick coupling valves shall be set perpendicular to finished grade unless otherwise designated on the drawings.

3.10 DRAIN VALVES

A. All laterals shall be provided with manual drain valves.

B. The mainline shall be drained with manual drain valves.

C. Drain valves are to be provided at sufficient intervals to provide complete drainage of all piping.

3.11 AUTOMATIC CONTROLLER

A. The automatic controller shall be installed at the approximate location shown on the irrigation drawings. Controller shall be wall mounted in a locking box. Suitable power supply will be supplied by the Electrical Subcontractor.

B. All regulatory authorities having jurisdiction and other applicable codes shall take precedence in connecting the 110-volt electrical service to the controller.

C. Install per regulatory authority having jurisdiction code, manufacturer's latest printed instructions, and as detailed.

D. Connect remote control valves to controller in sequence to correspond with station setting beginning with 1, 2, 3, etc.

E. Affix controller name (i.e., 'Controller A') on inside of controller cabinet door with letters minimum of 1 inch high. Affix a non-fading copy of irrigation diagram to cabinet door below controller name. Irrigation diagram is to be sealed between two sheets of 20 mil (minimum) plastic. Irrigation diagram shall be a reduced copy of the as-built drawing and shall show clearly all valves operated by the Controller, showing station number, valve size and type of planting irrigated.

3.12 CONTROL WIRING

A. Control Lines: All electric control lines shall be installed in the same trench with the pipe lines in a neat and orderly fashion. They shall be installed in the main and lateral trenching or in their own trenches, and where necessary, bundled together and taped every 5 feet.

B. Connections: any connections to existing pipe systems shall be made after consultation and approval of regulatory agencies.

C. All electrical equipment and wiring shall comply with regulatory authorities having jurisdiction and be installed by those skilled and licensed in the trade.

D. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible, and shall have a minimum of an 18 inch cover.

E. Control wires shall be installed to the side of the main line whenever possible. Placement over pipes is not permitted.

F. Where more than 1 wire is placed in a trench, the wiring shall be taped together at intervals of 10 feet.

G. An expansion curl shall be provided within 3 feet of each wire connection and at least every 100 feet of wire length on runs of more than 100 feet in length. Expansion curls shall be formed by wrapping at least 5 turns of wire around a 1 inch diameter pipe, then withdrawing pipe.

H. Control wire splices at remote control valves to be crimped and scaled with specified splicing materials. Line splices will be allowed only on runs of more than 500 feet and they must be located in 10 inch round splice boxes, which are green in color. The connector shall

be 3MD BY splice kit by 3M Corporation, or 'Snip-Snap' connector by Imperial, or equal. Use one splice per connector sealing packs.

I. Wire: Tape and bundle control wires every 10 feet and run alongside mainline. At all turns in direction make a 2 foot coil or wire. At all valve boxes coil wire around a ¾ inch piece of PVC to make a coil using 30 inches of wire. Provide 1 spare for every 10 hot wires – a minimum of 2 extra. Number all wires, using an electrical book of numbers, according to the plans. Number wires in all valve boxes, junction boxes and at the controller.

3.13 SHUT-OFF VALVES

A. Shall be located in the following locations:

1. After backflow preventer and prior to main supply loop;

2. Between mainline and each remote control valves; and,

3. To be located within planting and lawn areas.

B. All shut-off valves shall be located in valve boxes.

3.14 CLOSING OF PIPE AND FLUSHING OF LINES

A. All testing shall be done under the supervision of the OWNER or ENGINEER. Submit written requests for inspections to the OWNER at least 3 days prior to the anticipated inspection date.

1. Flushing: All lines shall be flushed prior to any installation of automatic sprinkler valves or sprinkler heads to remove all sand and other foreign matter with velocity of the flushing water not less than 4 feet per second. Flushing shall be terminated at the direction of the ENGINEER. The CONTRACTOR shall dispose of the flushing water without causing a nuisance or property damage.

2. Thoroughly flush out all water lines under a full head of water before installing heads, valves, quick couplers assemblies, etc. Maintain flushing for a minimum of three minutes at the valve located furthest from water supply;

3. After flushing, cap or plug all openings to prevent entrance of materials that would obstruct the pipe or clog heads. Leave in place until removal is necessary for completion of installation;

4. Test as specified below;

5. Upon completion of testing, complete assembly and adjust sprinkler heads for proper distribution; and,

6. All sprinkler heads and quick coupling valves shall be set perpendicular to finished grades unless otherwise designated on the drawings, or otherwise specified. Sprinkler heads adjacent to existing walls, curbs and other paved areas, shall be set to grade. Sprinkler heads, which are to be installed in lawn areas where the turf has not yet been established, shall be set 1 inch above the proposed finish grade. Heads installed in this manner will be lowered to grade when the turf is sufficiently established to allow walking on it without appreciable destruction. Such lowering of heads shall be done by this CONTRACTOR as part of the original contract with no additional cost to the OWNER.

3.15 TESTING

A. Pressure and Leakage Testing:

1. General: All pumps, gauges, and measuring devices shall be furnished, installed and operated by the CONTRACTOR and all such equipment and devices and their installation shall be approved by the ENGINEER.

2. Pressure Tests for Lines: Pressure piping installed under this contract shall be subjected to a pressure test after the pipe has been installed and partially backfilled for underground installations. Each pressure test shall be maintained for at least one hour at 150 psi during which time all joints shall be examined for leaks.

3. Before application of test pressure, all air shall be expelled from the pipe. If permanent air vents are not located at all high points, the CONTRACTOR shall install corporation cocks or fittings and valves at such points so the air can be expelled as the pipe system is slowly filled with water. After expulsion of air, the corporation cocks, or other blow-off devices shall be closed and the test pressure applied.

4. All exposed pipe, fittings, valves, and joints shall be carefully examined for leaks. All cracked, broken, or defective pipe, fittings, or valves discovered as a consequence of this pressure test shall be removed and replaced with sound material. All leaking, or defective joints shall be repaired, replaced, or corrected. After all necessary replacements and corrections, the test shall be repeated until satisfactory to the ENGINEER.

5. Leakage Testing for Pressure Piping: After completion of satisfactory pressure tests of piping, the lines shall be subjected to leakage tests. The duration of each leakage test shall be at least two hours and the pressures maintained during each leakage test shall be as specified above for the pressure tests.

6. Leakage is defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain the specified test pressure after the air

in the pipeline has been expelled and the pipe has been filled with water. The allowable limits for leakage of underground piping shall be determined by the following formula.

7. Allowable Limits for Leakage of Pressure Piping: The hydrostatic pressure tests shall be performed as hereinabove specified and no installation, or section thereof, will be acceptable until the leakage is less than the number of gallons per hour as determined by the formula:

$$L = \frac{SD(P)^{1/2}}{133{,}200}$$

in which,

L = Allowable leakage, in gallons per hour
S = Length of pipe being tested in feet
D = Nominal pipe diameter; in inches
P = Average test pressure during the test, in psi gauge

8. Water shall be supplied to the line during the test period as required to maintain the test pressure as specified. The quantity used, which shall be compared to the above allowable quantity, shall be measured by pumping from the calibrated container.

9. Where leakage exceeds the allowable limit, the defective pipe or joints shall be located and repaired. If the defective portions cannot be located, the CONTRACTOR shall remove and reconstruct as much of the work as is necessary in order to conform to the specified limits. No additional payment will be made for the correction of defective work, or to damage to other parts of the work resulting from such corrective work.

B. Balancing and Adjustment: The CONTRACTOR shall balance and adjust the various components of the sprinkler system so the overall operation of the system is most efficient. This includes a synchronization of the controllers, part circle sprinkler heads, and individual station adjustments on the controllers.

3.16 INSPECTION

A. The CONTRACTOR shall maintain proper facilities and provide safe access for inspection to all parts of the work.

B. Irrigation inspection shall consist of a minimum of:

1. Mainline pressure test;

2. Coverage test; and,

3. Final irrigation inspection.

C. If the laws, ordinances or any public authority require any work to be specifically tested or approved, the CONTRACTOR shall give the OWNER 3 days notice of its readiness for inspection.

D. The CONTRACTOR shall be solely responsible for notifying the OWNER where and when such work is in readiness for testing.

E. If any work should be covered up without approval of the OWNER it must be uncovered, if required, for examination at CONTRACTOR's expense.

F. No inspection will commence without 'Record' drawings and without completing previously noted corrections, or without preparing the system for inspection.

3.17 BACKFILL AND COMPACTING

A. After system is operating and required tests and inspections have been made, backfill excavations and trenches.

B. Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to the requirements of Section 02305, Excavation and Backfilling for Utilities.

C. Within all planting and lawn areas the existing 4 inch layer of topsoil shall be restored to its original condition and finish grade. After backfilling, the CONTRACTOR shall dispose of surplus earth offsite.

3.18 RESPONSIBILITY PRIOR TO FINAL ACCEPTANCE

The CONTRACTOR shall be responsible for maintenance until the inspection for completion and final acceptance. The responsibilities include the following:

A. Repair of all damage to installed material and equipment as needed.

B. Adjustment of all sprinkler heads with regard to proper height after landscape installation, arc coverage, radius and operation at least once a week.

C. The system shall be operational at least one month prior to Substantial Completion. Once a week after Substantial Completion, the CONTRACTOR shall clean, repair and adjust all

valves and other controls. Also, check to ensure that they are opening and closing properly.

D. Once a week the controllers shall be checked to ensure that the clocks have the right time, the program is properly set and that it is properly operating all of the valves correctly. Following inspections, the pump enclosure is to be locked.

END OF SECTION 02810

SECTION 02900

LANDSCAPE WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 WORK INCLUDED

A. The work included in this section consists of furnishing all labor, supplies, equipment and materials necessary to complete the installation and maintenance of all landscaping as shown on the Plans as base bid including the installation of sod, seeding, shrubbery, ground cover, trees, irrigation, etc. as shown, as well as all other related responsibilities as described in these Specifications and accompanying plans.

B. Installation: All plant materials included shall be of the specific size and quality indicated on the plans and in these specifications and shall be installed in strict accordance with sound nursery practices and shall include maintenance and watering for all work outlined on the plans and specifications until final acceptance. Contractor shall maintain and weed landscaped median and entry sign areas when they become unsightly.

C. Quantities and Locations: The ENGINEER reserves the right to adjust the number and locations of the designated types and species to be used at any of the locations shown in order to provide for any modifications which might become necessary.

1.03 RELATED WORK

A. Section 02919 - Topsoil.

B. Section 02922 - Sodding.

1.04 QUALITY ASSURANCE

A. Responsibility for Assuring Quality Work: The CONTRACTOR's Superintendent shall be well versed in Florida plant material, planting operations, reading design plans, and coordination with other performing contracts or services in the job area.

All employees shall be competent and highly skilled in their particular job in order to properly perform the work assigned to them. The CONTRACTOR shall be responsible for maintaining the quality of the material on the job throughout the duration of his responsibility.

B. Correct Grade of Plants: In the event that it becomes apparent that any nursery supplying plants for this work has knowingly and consistently represented the grade of plants as

being higher than their actual grades as determined under these provisions, all plants already delivered from such sources shall be removed from the job at the CONTRACTOR's expense, and no further plants will be accepted from such nursery until written evidence is submitted and confirmed that all material for delivery has been inspected and approved by inspectors of the State Plant Board as being of the grade as represented.

C. Authority for Nomenclature, Species, Etc.: All plant material shall conform to the names given in Hortus Third, 1976 edition. Names of varieties not included therein conform generally with names accepted in the nursery trade.

D. Grade Standards: All plant materials shall be nursery grown except where specified as collected material, and shall comply with all required inspections, grading standards and plant regulations as set forth by the Florida Department of Agriculture's "Grades and Standards for Nursery Plants" revised 1973, or with any superseding specifications that may be called for on the Plans or in the Specifications. All plants not listed in the grades and standards for nursery plants, shall conform to a Florida No. 1 as to: (1) Health and Vitality, (2) Condition of Foliage, (3) Root System, (4) Freedom from Pest or Mechanical Damage, (5) Heavily Branched and Densely Foliated according to the accepted normal shape of the species, or sport, (6) Form and branching habit.

E. Balled and Burlapped (B&B) and Wire Balled and Burlapped (WB&B) Plants: These plants shall be properly protected until they are planted. The plant shall be handled only by the earth ball and not be the plant itself.

Any B&B or WB&B plant which shows evidence of having been handled by a method other than the method outlined above, and resulting in a cracked or broken ball or of the roots being loosened within the ball shall be rejected.

For plants grown in soil of loose texture, which does not readily adhere to the root system, (especially in the case of large plant material), WB&B plants may be specified. For WB&B plants, before plant is removed from the hole, sound hog wire shall be placed around the burlapped ball and looped and tensioned until the burlapped ball is substantially packaged by the tightened wire netting to prevent disturbing the loose soil around the roots during handling. Any wire, synthetic material or chemically treated material will be removed from the rootball at planting time, and all ties shall be removed from the rootball and around the trunk at planting.

F. Container Grown Plants (CG): Any Container Grown (CG) plants, which have become "pot bound" or for which the top system is out of proportion (larger) to the size of the container, will not be acceptable.

With metal containers, unless the root-ball system slips easily and unbroken from the can, a nursery can-cutter shall be used to slit the can in such a way that the can may be opened fully.

CG plants shall not be removed from the can until immediately before planting, and with all due care to prevent damage to the root system.

G. Submit to the ENGINEER the names and locations of nurseries proposed as sources of acceptable plant material. The ENGINEER reserves the right to visit the nursery to inspect and/or select the specified material.

H. The ENGINEER will be included in the hand selecting of any Live Oaks for the project.

1.05 DELIVERY, STORAGE AND HANDLING

A. Inspection and Transporting: Movement of nursery stock shall comply with all Federal, State, and local laws and regulations. Therefore, required inspection certificates shall accompany each shipment, and shall be filed with the ENGINEER.

Wrap root balls with burlap. Wire wrap burlap if root ball is not sufficiently compacted. Palms will not require burlap wrapping if the following requirements are met:

1. Dug from marl or heavy soil that adheres to roots and retains shape without shattering.

2. Moistened material used to cover ball and roots not exposed to wind and sun.

3. Transport material on vehicles large enough to allow plants not to be crowded. Plants shall be covered to prevent wind damage during transit and shall be kept moist, fresh and protected at all times. Such protection shall encompass the entire period which the plants are in transit, being handled, or are in temporary storage.

B. All plant material shall not remain on the work site longer than two (2) days prior to being installed.

1.06 SUBSTITUTIONS

A. Substitutions of plant types or change in the size of plant material will only be permitted upon submission of documented proof that the particular plant type and size specified is not obtainable. The CONTRACTOR must submit substitutions that meet Palm Beach County Highway Construction & Engineering Division, Palm Beach County Environmental Protection Department, FP&L, and Palm Beach County Traffic Division requirements for canopy, trunk diameter, species, height, clear trunk, setbacks, etc.

B. Where B&B or WB&B plants are specified, CG plants of the same species, etc., will not be accepted. Where a B&B or WB&B is not specified on a particular plant material, B&B, WB&B or CG plants may be used provided they meet all specifications.

1.07 GUARANTEE

A. All plant material shall be guaranteed for a minimum of one (1) calendar year from the time of final acceptance, which will normally coincide with the Final Completion Certification at project completion.

1.08 REPLACEMENT

A. The guaranteeing of plant material shall be construed to mean the complete and immediate replacement of plant material if it is:

1. Not in a healthy growing condition.

2. There is a question to its survival ability at the end of the guarantee period.

3. It is dead.

1.09 SIZE, QUALITY AND GRADE OF REPLACEMENT

A. Replacement plant material shall be of the same species, quality and grade as that of the plant to be replaced. The size of the replacement shall not necessarily be the same size as the original specified plant at its initial planting but shall closely match specimens of the same species. Replacements shall be guaranteed for a period equal to the originally specified guarantee. This guarantee period shall begin at time of plant replacement.

1.10 GUARANTEE NULL AND VOID

A. The guarantee shall be null and void for plant material which is damaged or dies as a result of "Act of God" limited to hail, freeze, lightening, winds which exceed hurricane force, and lethal yellowing, providing the plant was in a healthy growing condition prior to these "Acts of God".

PART 2 - MATERIALS

2.01 PLANT MATERIAL

A. Florida No. 1: Except where another grade is specifically called for in the Plans, all plant material shall be no less than Florida No. 1 at the time of final inspection immediately prior to the acceptance by the OWNER.

B. Habit of Growth: All plant material shall have a habit of growth that is normal for that species and shall be sound, healthy, vigorous and free from insects, plant diseases, injuries, and dead limbs.

C. Branching, Leafing, Measurements and Ball Sizes:

1. Trees and Shrubs: Requirements for the measurement, branching character, ball diameter, depth and other standards shall follow the Code of Standards recommended by the American Association of Nursery Stock, Bulletin Z-60.1-1973 and as revised.

2. Palms: Requirements for the measurement of clear trunk, clear wood and graywood ball diameter and depth shall comply with requirements as set forth by

the Florida Department of Agriculture's "Grades and Standards for Nursery Plants, Part II for Palms and Trees".

D. Die-Back and Leaf-Drop: Plant material showing signs of die-back or leaf-drop will not be accepted and must be removed from the job immediately if so directed by the ENGINEER. Therefore, any plant material with tendencies toward leaf-drop or die-back must be root pruned early enough to provide a sound network of hair roots prior to relocation to the job site.

E. Mechanical Destruction of Foliage: Mechanical destruction of foliage resulting from root pruning shall not effect more than 10% of the total foliage prior to planting on the job site. Loss of foliage caused by seasonal change will be accepted.

F. Spanish Moss: If Spanish Moss (Tillandsia usneoides) exists on plant material, it shall be completely removed prior to planting on the job site.

G. Palms: Before transporting, see Delivery, Storage and Handling; for requirements related to wrapping of root balls:

1. Remove a minimum of fronds from the crown of the palms to facilitate transporting and handling.

2. Palms with burn marks, nail holes, and frond boots on trunk shall not be accepted.

3. Using untreated burlap strip or untreated cotton twine, tie Sabal Palmetto buds and leave in place until Palmetto is established. Tying shall be as set forth in Florida Department of Agriculture's "Grades and Standards for Nursery Plants". Tying of other palms shall be at the option of the CONTRACTOR.

4. To reduce head volume, Palm fronds may be taper trimmed by not more than one-third (1/3).

5. Palm trees showing cable or chain marks and equipment scars shall be rejected.

H. Chlorosis: The allowable level of Chlorosis in foliage shall be as set forth in the Florida Department of Agriculture's "Grades and Standards for Nursery Plants".

2.02 PLANTING SOILS

A. General Type: All plant material with the exception of Sabal Palmetto shall be planted with planting soil mixed with 50% original soil, if the soil is of good quality, as determined by the ENGINEER. The planting soils shall be sandy loam (50% sand, and 50% muck) typical of the locality. The soil must be taken from ground that has never been stripped, with a slight acid reaction (5.5 to 6.5 ph) and without an excess of calcium or carbonate. Soil shall be delivered in a loose friable condition.

B. Special Type: Planting soil for palms shall be a good grade of salt free sand, which is free of all weeds.

2.03 WATER

A. Water shall be potable, from municipal water supplies or other sources which are approved by a public health department.

2.04 MULCH

A. Mulch shall be Eucalyptus mulch or other approved non native tree bark mulch. It must be uniformly shredded and be free from large pieces of bark, foreign matter, weed seeds and any other organic or inorganic material. Submit sample for approval. CONTRACTOR shall apply one application at initial installation and a second application prior to final acceptance.

2.05 FERTILIZER

A. New Plant Material: Trees, palms and shrubs, fertilize with Agriform planting tablets, 20-20-5 formula, 21 grams.

B. New Ground Covers: Fertilize with an approved fertilizer 50% or greater organic 6-6-6 or 8-8-8 with minor elements including, but not limited to, iron zinc and manganese.

C. Composition of Quality: All fertilizer shall be uniform in composition and dry. Granular fertilizer shall be free flowing and delivered in manufacturer's standard container with name of material, weight and guaranteed analysis printed on container. Tabletized fertilizer shall be delivered in unopened containers or boxes. All bags, containers or boxes shall be fully labeled with the manufacturer's analysis. Submit labels to ENGINEER for approval prior to placement of fertilizer.

D. All fertilizer shall comply with the State of Florida fertilizer laws.

2.06 PRUNING PAINT

A. Pruning Paint shall be commercial tree paint, which is waterproof, antiseptic, adhesive, elastic and free of kerosene, water, cresol and any other substances harmful to plant material.

2.07 VEGETATIVE ROOT INHIBITOR

A. A vegetative root inhibitor shall consist of a polypropylene fabric with root control time release modules of Trifluralin with an effective life of 100 years.

B. Vegetative root inhibitor shall be Bio-Barrier as manufactured by Reemay, Inc. or approved equal.

PART 3 - EXECUTION

3.01 INSPECTION

A. Utilities: The location and existence of utilities (overhead and underground) shall be thoroughly investigated and verified by the CONTRACTOR before the work begins in the area of said utilities. The CONTRACTOR shall exercise care in digging and work so as not to damage existing utilities in said areas, such as underground pipes, cables, wires, etc. Should such overhead or underground obstructions be encountered which interfere with planting, the ENGINEER shall be consulted immediately in order for a decision to made on the relocations of plant material to clear such obstruction. The CONTRACTOR shall be responsible for the immediate repair of any damage to utilities caused by their work.

3.02 PREPARATION

A. Staking Plant Locations: Plant locations must be staked or marked prior to plant hole excavation or placing on deck, by scaling the plants from existing features found on-site and shown on the plans, and utilizing Sunshine State One Call locations. Stakes shall be removed prior to Final Completion.

B. Spacing of Shrubs: Shrub beds located next to another bed, walkway, structure, etc., shall have the plants along the perimeter spaced so that the plants can mature properly without growing into the other bed, walkway, structure, etc.

C. Excavation of Plant Holes: Excavation of plant holes shall be roughly cylindrical in shape with the sides approximately vertical. The ENGINEER reserves the right to adjust the size and shape of the plant hole and the location of the plant in the hole to compensate for unanticipated structures or unanticipated factors. All plant holes shall be sufficiently deep to allow the rootball to set on existing soil and have root collar at grade level. Plants shall be centered in the holes with the tree trunk locations scaled from existing permanent structures as shown on the drawings. Plants shall be set straight or plumb in locations. All plant holes to accommodate plants with ball sizes less than 24 inches in diameter shall be at least 18 inches greater than the diameter of the ball. All plant holes to accommodate plants with ball sizes 2 feet and larger in diameter shall be at least twice the diameter of the ball. The excavated material from the plant holes may not be used to back-fill around the plant material. Such material shall be disposed of either on the project site or off the site as directed by the ENGINEER. Plant holes for shrub material planted in mass shall meet all requirements listed above for plant holes. However, they shall not be individual holes but one continuous hole or excavation. Plant holes for hedge material shall also meet all requirements listed above for plant holes, however, a continuous trench shall be used in lieu of individual holes.

3.03 INSTALLATION

A. Setting of Plants:

1. When lowered into the hole the plant shall rest on the prepared hole bottom such that the roots after settlement are level, or slightly above the level of its previous growth condition and the final level of the ground around the plant shall conform to the surrounding grade. The plants shall be set straight or plumb or normal to the relationship of their growth prior to transplanting. The ENGINEER reserves the right to realign any plant material after it has been set.

2. Palms of the Sabal species may be set deeper than the depth of their original growth condition in order to lessen the necessity for support or bracing. For such deeper planting however, it will be required that the underlying soil be friable and that the clear trunk requirements set forth in the plant list be maintained from the finished grade and NOT from the previous grade of the palm trees before it was transplanted.

3. Plant material of the shrub category and smaller must be handled by the ball only. Plant material too large for hand handling, if moved by winch or crane, must be thoroughly protected from chain, rope or cable marks, girdling, bark slippage, limb breakage and any other damage that might occur by improper handling or negligence.

4. All palm trees handled by the trunks must be wrapped with burlap and wood battens, held in place by banding strips as called for in the details.

B. Backfilling:

1. Use planting soils specified in Article 2.02, Planting Soil. Backfill to the bottom two thirds of the planting hole and firmly tamp and settle by watering as backfilling progresses. After having tamped and settled the bottom two thirds (2/3) of the hole, thoroughly puddle with water and fill remaining one third (1/3) of the hole with planting soil, tamping and watering to eliminate air pockets.

C. Application of Fertilizer:

1. Fertilize New Planting (Trees, Palms and Shrubs) as follows:

(a) Specified Container Size	Application Rate
1 gallon container	1 tablet
3 gallon container	2 tablets
5 gallon container	3 tablets
7 gallon container	5 tablets

(b) Large tubs or boxes and B&B material shall receive one (1) tablet for each ½ inch of trunk diameter (measured 3 feet from ground). For large shrubs, one (1) tablet for each 1 foot of height or spread.

D. Mulch: Within 24 hours after planting, planting areas must be mulched as called for in these specifications. The mulch shall be uniformly applied to a depth of 3 inches over all shrub, tree and groundcover areas and any areas indicated on the plans.

E. Staking and Guying shall be installed within 24 hours; in accordance with details.

F. Initial Watering: Initially, water the plant material to develop uniform coverage and deep water penetration of at least 6 inches. Avoid erosion, puddling, and washing soil away from plant roots.

G. Hand Watering: Provide hand watering of plant material as necessary subject to weather conditions, to maintain healthy growing conditions until final acceptance. This shall be in addition to water received from irrigation system, if any.

H. Pruning:

1. The amount of general pruning shall be limited to the minimum necessary to remove dead or injured twigs and branches and to compensate for the loss of roots as a result of transplanting operations. Pruning shall be done in such a manner as not to change the natural habit of shape of a plant, and in accordance with National Arborist Association standards for pruning.

2. All broken or damaged roots shall be cut off smoothly. The tops of all trees shall be pruned in a manner complying with standard horticultural practices. All cut surfaces of ½ inch or more in diameter above ground level shall be treated with an approved commercial tree paint.

I. Weeding: In the event that weeds or undesirable vegetation becomes prevalent to such an extent that they threaten plant material or become unsightly, they shall be removed as directed by the ENGINEER. If necessary, the plant material and/or planting soil shall be replaced as needed to eliminate the weeds at the expense of the CONTRACTOR.

3.04 CLEANING AND PROTECTION

A. Disposal of Trash: All debris and other objectionable material created through planting operations and landscape construction shall be removed completely on a daily basis from the job or as directed by the ENGINEER. Excess soil shall be disposed of as directed by the ENGINEER.

B. Responsibility for Protection and Restoration of Property: The CONTRACTOR shall be responsible for all damage to property whether it is accidental or necessary for the completion of their contract.

C. Protection Against Mechanical Damage: The CONTRACTOR's responsibility for protection against mechanical damage shall include providing protection from vehicles and providing warning signs and barricades as might be necessary and they shall repair, restore and replace any planting areas which become damaged as a result of any negligence of the CONTRACTOR or their employees in complying with these requirements. Coordination shall be with the OWNER and the ENGINEER.

D. Responsibility Prior to Final Acceptance:

1. Maintenance shall begin immediately after each plant is planted and continue until final acceptance, which shall coincide with the Contractual Final Completion Certification.

2. Plants shall be watered by hose, soaking thoroughly each day for the first two weeks (14 calendar days) and every other day for the following two week period. Soaking then shall continue on a twice weekly basis for another period of three (3) weeks for material over 5 feet height, amounting to a total of 28 days after installation of planting under 5 feet and a total of 49 days for plants over 5 feet. All watering is required without regard to an irrigation system.

3. Plant maintenance shall include watering, pruning, weeding, cultivating, mulching, tightening and repairing of guys, stakes, braces, etc., replacement of sick or dead plants, resetting plants to proper grades or upright position and maintenance of the watering saucer, and all other care needed for proper growth of the plants. Plant material rejected during the course of the construction shall be removed within five working days and replaced before the inspection for completion will be scheduled. Weeding shall occur whenever planted areas become unsightly.

4. During the maintenance period and up to the issuance of Certificate of Final Completion, the CONTRACTOR shall do all seasonal spraying and/or dusting of all planting. Stakes shall be removed prior to Final Completion after tree is stable. The materials and methods shall be in accordance with the highest standard nursery practices and as recommended by the County Agent, or Horticultural engineer and approved by the ENGINEER, prior to implementation.

5. Planting areas and plants shall be protected against trespassing and damage. If any plants become damaged or injured they shall be treated or replaced, as directed and in compliance with this specification. No work shall be done within or over planting areas or adjacent to plants without proper safeguards and protection.

END OF SECTION 02900

SECTION 02919

TOPSOIL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to restore the landscape disturbed by construction, as indicated on the drawings, as specified herein or both.

B. Including but not necessarily limited to the following:

1. Topsoil Stripping.

2. Topsoil Mixing and Spreading.

C. There shall be no classification of excavation for measurement of payment regardless of materials encountered.

1.03 RELATED WORK

A. Section 02230 - Site Clearing.

B. Section 02300 - Earthwork.

C. Section 02922 - Sodding

PART 2 - PRODUCTS

2.01 TOPSOIL

A. Topsoil shall be obtained from any previously established stockpile on site, to the extent that suitable material is available.

B. Additional topsoil, if required, shall be obtained by mixing existing on-site sandy fill with imported muck or compost.

C. Topsoil, whether obtained from stockpile, or mixed as described in "B" above, shall be sandy loam, and shall have the following characteristics:

1. 95% of topsoil shall pass a ¼ inch sieve.

2. Topsoil shall be free of stones 1 inch in longest dimensions, earth clods, plant parts, and debris.

3. Organic matter content shall be 4% to 12% of total dry weight.

4. pH and nutrient content shall be adjusted as necessary to conform with recommendations made by testing laboratory. (See 2.01 (D))

D. Samples shall be submitted to OWNER for testing. Test shall indicate compliance with the specifications and recommendations as to the type and quantity of soil additives required to bring the nutrient content and pH to satisfactory levels for planting specified plant material. Tests shall be required at a rate of one per 500 cubic yards of material placed, for the first 5,000 cubic yards of material, and may be reduced at the ENGINEER's discretion thereafter. Sampling shall be done in the presence of the ENGINEER. The CONTRACTOR shall be responsible for the cost of testing.

PART 3 - EXECUTION

3.01 JOB CONDITIONS

A. Protection: Use all means necessary to protect existing objects and vegetation. In the event of damage, immediately make all repairs and replacements necessary to the acceptance of the ENGINEER.

3.02 FILLING AND GRADING:

A. Topsoil shall be spread in a uniform 2 inches layer after compaction, over all sodded and pervious areas, and finished to existing grades shown on the plans, making allowance, where necessary, for sod. Grades shown include 2 inches for thickness of sod in all sodded areas.

END OF SECTION 02919

SECTION 02922

SODDING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 WORK INCLUDED

A. The work included in this section consists of furnishing all labor, supplies, equipment and materials necessary to complete the installation of sod and associated materials hereinafter listed and as shown on the plans.

1.03 RELATED WORK

A. Section 02300 - Earthwork.

B. Section 02919 - Top Soil.

1.04 QUALITY ASSURANCE

A. Sodding work shall be performed by a firm specializing in sodding.

B. Substitutions: Do not make substitutions. If specified sod is not obtainable, submit proof of non-availability to ENGINEER, together with proposal for use of equivalent material.

C. Analysis and Standards: Package standard products with supplier's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.

1.05 SUBMITTALS

A. Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Plant and Material Certifications:

1. Certificate of inspection as required by governmental authorities.

2. Manufacturer's or vendor's certified analysis for soil amendments or fertilizer materials.

1.06 DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

B. Sod: Time delivery so that sod will be placed within 24 hours after stripping. Protect sod against drying.

C. Transporting:

1. Sod transported to the project in open vehicles shall be covered with tarpaulin or other suitable covers securely fastened to the body of the vehicle to prevent injury to the sod material. Closed vehicles shall be adequately ventilated to prevent overheating of the sod. Evidence of inadequate protection against drying out in transit shall be cause for rejection.

2. Sod shall be kept moist, fresh and protected at all times. Such protection shall encompass the entire period during which the sod is in transit, being handled, or in temporary storage.

3. Upon arrival at the temporary storage location or the site of work, sod shall be inspected for proper shipping procedures. Should the roots be dried out, the ENGINEER will reject the sod. When sod has been rejected, the CONTRACTOR shall remove it at once from the area of the work and replace it.

4. Unless otherwise authorized by the ENGINEER, the CONTRACTOR shall notify the ENGINEER at least 48 hours in advance of the anticipated delivery date of sod material. A legible copy of the invoice, showing species and variety of sod included for each shipment shall be submitted to the ENGINEER. Certificate of Inspection must accompany each sod shipment.

1.07 JOB CONDITIONS

A. Begin installation of sod after preceding related work is accepted.

B. Environmental Requirements:

1. Install sod during months acceptable to the ENGINEER.

2. Do not install sod on saturated soil.

C. Protection: Erect signs and barriers to control vehicular traffic.

D. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

1.08 SEQUENCING AND SCHEDULING

A. Correlate planting with specified maintenance periods to provide maintenance from date of Substantial Completion.

B. Coordination with sodding: Plant trees, palms and shrubs after final grades are established and prior to planting of sod, unless otherwise acceptable to ENGINEER. If planting of trees, palms and shrubs occurs after sod work, protect sod areas and promptly repair damage to lawns resulting from planting operations.

1.09 SPECIAL PROJECT WARRANTY

A. Warranty sod through specified lawn maintenance period, and until Final Certification.

PART 2 - PRODUCTS

2.01 PLANTING SOIL

A. Provide new planting soil that is fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stones larger than 1 inch in any dimension, and other extraneous or toxic matter harmful to plant growth.

B. Obtain planting soil from local sources or from areas having similar soil characteristics to that found at project site.

C. Refer to Section 162 of the "FDOT Standard Specifications for Road and Bridge Construction" dated 1991 for Topsoil Specifications.

2.02 COMMERCIAL FERTILIZER

A. For sod, provide fertilizer with percentage of nitrogen required to provide not less than 1 pound of actual nitrogen per 1,000 sq. ft. of lawn area and not less than 4% phosphoric acid and 2% potassium. Provide nitrogen in a form that will be available to sod during initial period of growth; at least 50% of nitrogen to be organic form.

2.03 SOD

A. Provide strongly rooted sod, not less than 2 years old, free of weeds and undesirable native grasses, and machine cut to pad thickness of 1-1/2 inch (plus or minus 1/4 inch), excluding top growth and thatch. Provide only sod capable of vigorous growth and development when planted (viable, not dormant).

B. Provide sod uniform pad sizes with maximum 5% deviation in either length or width. Broken pads with uneven ends will not be acceptable. Sod pads incapable of supporting their own weight when suspended vertically with a firm grasp on upper 10% of pad will be rejected.

C. Provide sod to match the existing sod and composed of the following:

1. St. Augustine Floritam

2. Argentine Bahia Grass

D. Sod shall be nursery grown on cultivated mineral agricultural soils. Sod shall have been mowed regularly and carefully maintained from planting to harvest.

E. American Sod Producers Association (ASPA) Grade: Nursery Grown or Approved. Field grown sod is not acceptable.

F. Furnished in pads:

1. Size:

a. Length: 24 inches plus or minus 5%.

b. Width: 18 inches plus or minus 5%

c. Thickness: 1-1/2 inches excluding top growth and thatch.

2. Not stretched, broken or torn.

G. Uniformly mowed height when harvested: 2 inches.

H. Thatch: Maximum 1/2 inch uncompressed.

I. Inspected and found free of disease, nematodes, pests, and pest larvae, by entomologist of State Department of Agriculture.

J. Weeds:

1. Free of Bermuda grass, nut grass or other objectionable weeds.

K. Uniform in color, leaf texture, and density.

2.04 WATER

A. Water shall be potable, from municipal water supplies or other sources which are approved by a public health department.

2.05 FERTILIZER

A. The fertilizer shall be suitable for the type of sod and area as recommended by the State Department of Agriculture.

2.06 HERBICIDES

A. As recommended by the State Department of Agriculture.

2.07 STAKES

A. Softwood, 3/4 inch diameter, 8 inch length.

PART 3 - EXECUTION

3.01 PREPARATION OF GROUND SURFACE

A. Before mixing, clean planting soil of roots, plants, sods, stones, clay lumps, and other extraneous material harmful or toxic to plant growth.

B. Mix specified fertilizers with planting soil as necessary at rates specified. Delay mixing fertilizer if planting will not allow placing of planting soil within a few days.

C. For sod, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.

3.02 PREPARATION OF PLANTING BEDS

A. Loosen subgrade of lawn areas to a minimum depth of 4 inches. Remove stones measuring over 1 1/2 inches in any dimension. Remove sticks, stones, rubbish, and other extraneous matter. Limit preparation to areas which will be planted promptly after preparation.

B. Spread planting soil to minimum depth of 2 inches or as required to meet lines, grades, and elevations shown, after light rolling and natural settlement. Add specified fertilizer and mix thoroughly into upper 4 inches of topsoil.

C. Place approximately 1/2 of total amount of top soil required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil. Add specified soil amendments and mix thoroughly into upper 4 inches.

D. Where sod is to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for lawn planting as follows: Till to a depth of not less than 6 inches. Apply fertilizers as specified. Remove high areas and fill in depressions. Till soil to a homogenous mixture of fine texture, free of lumps, clods, stones, roots and other extraneous matter.

E. Prior to preparation of unchanged areas, remove existing grass, vegetation and turf. Dispose of such material outside of OWNER's property. Do not turn existing vegetation over into soil being prepared for lawns.

F. Allow for sod thickness in areas to be sodded.

G. Apply specified commercial fertilizer at rates specified and thoroughly mix into upper 2 inches of topsoil. Delay application of fertilizer if lawn planting will not follow within a few days.

H. Fine grade sod areas to smooth, even surface with loose, uniformly fine texture. Roll, rake, and drag lawn areas, remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.

I. Moisten prepared sod areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting lawns. Do not create a muddy soil condition.

J. Restore sod areas to specified condition, if eroded or otherwise disturbed, after fine grading and prior to planting.

3.03 SODDING NEW LAWNS

A. Lay sod within 24 hours from time of stripping.

B. Lay sod to form solid mass with tightly fitted joints. Butt ends and sides of sod strips; do not overlap. Stagger strips to offset joints in adjacent courses. Work from boards to avoid damage to subgrade or sod. Tamp or roll lightly to ensure contact with subgrade. Work sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering of adjacent grass.

C. Anchor sod on slopes with wood pegs to prevent slippage.

D. Water sod thoroughly with a fine spray immediately after planting.

3.04 MAINTENANCE

A. Begin maintenance immediately after planting.

B. Maintain lawns for not less than 30 days after Substantial Completion Certification, and longer as required to establish an acceptable lawn.

C. Maintain sod by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.

D. Mowing:

1. Whenever grass reaches a height of 3 inches, it shall be cut back to 2 inches with all clippings removed.

2. After two mowings, CONTRACTOR shall topdress the sod with an application of fertilizer at the rate of 1 pound of actual nitrogen per 1,000 square feet.

3.05 CLEANUP AND PROTECTION

A. During sodding work, keep pavements clean and work area in an orderly condition.

B. Protect sodding work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged sod work as directed.

3.06 INSPECTION AND ACCEPTANCE

A. Sod areas will be accepted when in compliance with all the following conditions:

1. The roots are thoroughly attached to the soil.

2. Absence of visible joints.

3. All areas show a uniform stand of specified grass in healthy condition.

4. At least 30 days have elapsed since the completion of the work in this section.

B. When inspected sod work does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by ENGINEER and found to be acceptable. Remove rejected plants and materials promptly from project site.

C. Procedure:

1. The CONTRACTOR shall submit a request for acceptance in writing to the ENGINEER. Request must be received not less than 10 days before the anticipated date for final inspection.

2. Upon completion of all repairs and/or renewals required by ENGINEER at the inspection, the ENGINEER will verify the completeness of the work and then notify the OWNER in writing that the work is accepted.

3. Upon Final Completion, the OWNER will assume maintenance of all sod areas.

END OF SECTION 02922

APPENDIX A

From 11th Ave So to 12th Ave So

InfraMap CORP
Utility Locators • Surveyors • Consulting Engineers
1860 Old Okeechobee Road, Suite 291
West Palm Beach, Florida 33409
(561) 586-0790 (800) 314-8856 Fax (561) 586-1171

VACUUM TEST HOLE REPORT

PN: PF02115 TEST HOLE NO.: 1

PROJECT NAME:

LOCATE REQUESTED BY: CTA

REQUESTED: SIZE: 12" TYPE: GAS (WATER) ELEC TELE CATV SAN FM STORM STEAM OTHER:

FOUND: SIZE: 10" MATRL: (CI) DI STL W/STL CLAY AC RCP PCCP CMP PE PVC(GREEN) PVC(WHITE) PVC(GRAY) PVC(BLUE) COPPER CAST IN-PLACE CONC. PRECAST CONC. DBC VCPX OTHER: TYPE: GAS (WATER) ELEC TELE FO CATV SAN FM STORM STEAM

D.O.T. JOB# N/A WORK ORDER# N/A.

PROJECT LOCATION: (CITY, COUNTY, STATE) Lake Worth - Palm Bch. Fl

SHEET C-3 OF PROPOSED: Utility Work

FORM BY: B.P ASSISTED BY: E.R, AG # OF HOLES: 1

PAVING CONDITION: GOOD FAIR POOR (N/A) DATE DUG: 10/19/15

SOIL CONDITIONS: HARD (SOFT) WET MOIST (DRY) (SAND) CLAY ROCKY

UTILITY CONDITION: (GOOD) FAIR POOR SEE NOTE

INSTALLED: PK HUB & TAC STL PIN SPIKE CHS. "X" AT: (CROWN) EDGE TOP OF UTILITY.

RIBBON INSTALLED: RED (BLUE) YELLOW ORANGE GREEN PINK WHITE

ELEV SURVEY PIN

EXIST. GRADE

PAVING THICKNESS | PAVING MATERIAL

COVER (TOP): 1.85

ELEV. (TOP):

COVER (BOTTOM):

ELEV. (BOTTOM):

WIDTH: 11" ±

ROD CHECK
T 5.18
+B 1.85
- 7.03
L 7.03

DRAWING FACING: East

SURVEY PIN TO BE LOCATED BY: N/A

INC READING	ROD	COVER	OFFSET	ADJUSTMENT

NOTES:
REQUESTED 12" WM
FOUND 10" WM

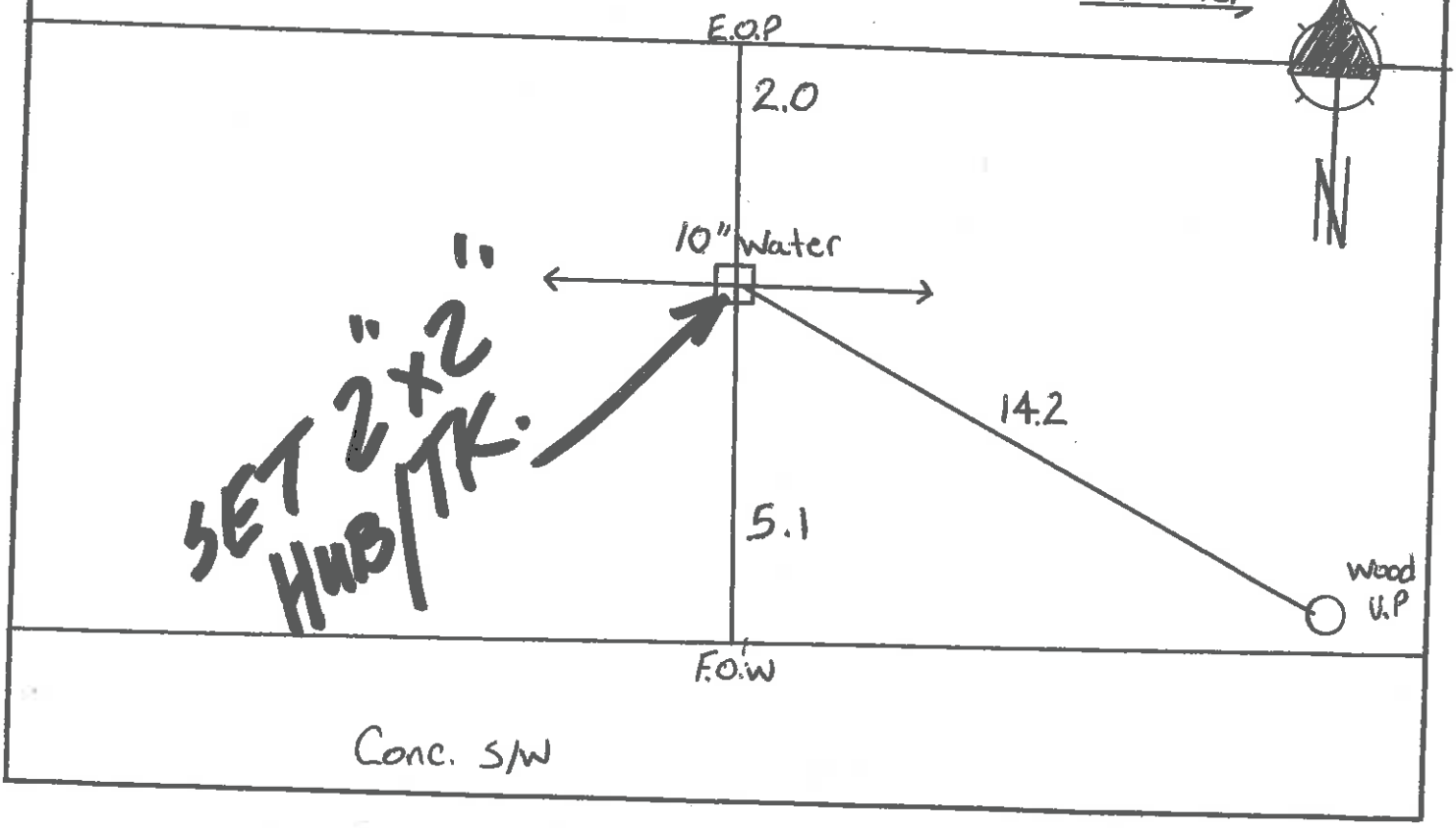
PRELIMINARY

inc

SHOW NEAREST CROSS STREET AND SURVEY STATION, AND INDICATE TYPE AND TREND OF UTILITY AND SIDE OF DUCT EXPOSED

12th Ave S. TO S. C Tes

NOT TO SCALE



From 11th Ave So to 12th Ave So

2

InfraMap CORP

Utility Locators · Surveyors · Consulting Engineers

1860 Old Okeechobee Road, Suite 201
West Palm Beach, Florida 33409
(561) 586-0790 (800) 314-8856 Fax (561) 586-1171

VACUUM TEST HOLE REPORT

PN: PF02115 TEST HOLE NO.: 2

PROJECT NAME:

LOCATE REQUESTED BY: CTA

REQUESTED: SIZE: TYPE: GAS WATER ELEC TELE CATV SAN FM STORM STEAM
OTHER: F.O

FOUND: SIZE: 2" MATRL: CI DI STL W/STL CLAY AC RCP PCCP CMP PE PVC(GREEN) PVC(WHITE) PVC(GRAY) PVC(BLUE) COPPER CAST IN PLACE CONC. PRECAST CONC. (SRC) VCPX
OTHER:
TYPE: GAS WATER ELEC TELE (FO) CATV SAN FM STORM STEAM

D.O.T. JOB# N/A WORK ORDER# N/A.

PROJECT LOCATION: (CITY, COUNTY, STATE) Lake Worth - Palm Bch. Fl

SHEET C-3 OF PROPOSED: Utility Work

FORM BY: B.P ASSISTED BY: E.R, AG # OF HOLES: 1

PAVING CONDITION: GOOD FAIR POOR (N/A) DATE DUG: 10/19/15

SOIL CONDITIONS: HARD (SOFT) WET MOIST (DRY) (SAND) CLAY ROCKY

UTILITY CONDITION: (GOOD) FAIR POOR SEE NOTE

INSTALLED: PK (HUB & TACK) STL PIN SPIKE CHIS. "X" AT: (CROWN) EDGE TOP OF UTILITY.

FLUSHMOUNT INSTALLED: RED BLUE YELLOW (ORANGE) GREEN PINK WHITE

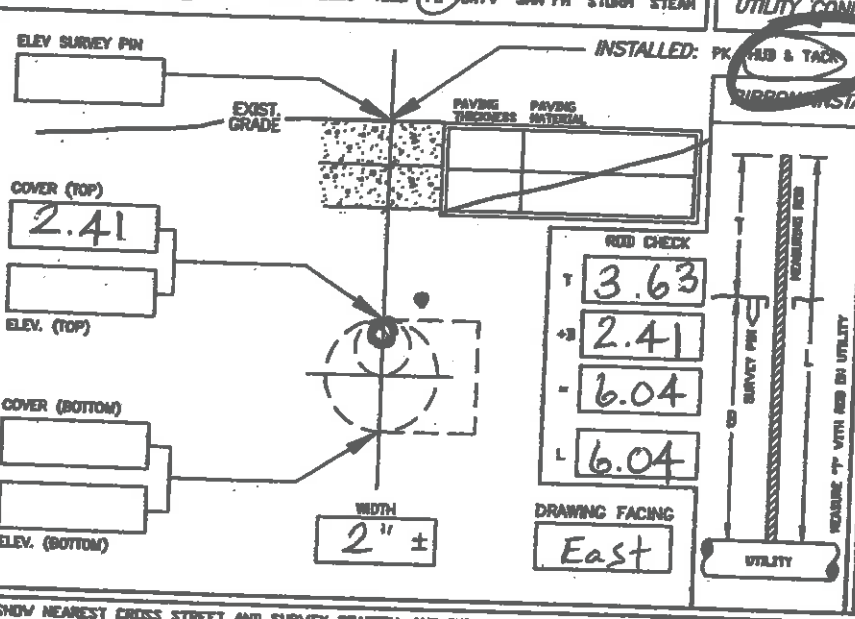
SURVEY PIN TO BE LOCATED BY: N/A

INC READING:	ROD:	COVER:	OFFSET:	ADJUSTMENT:

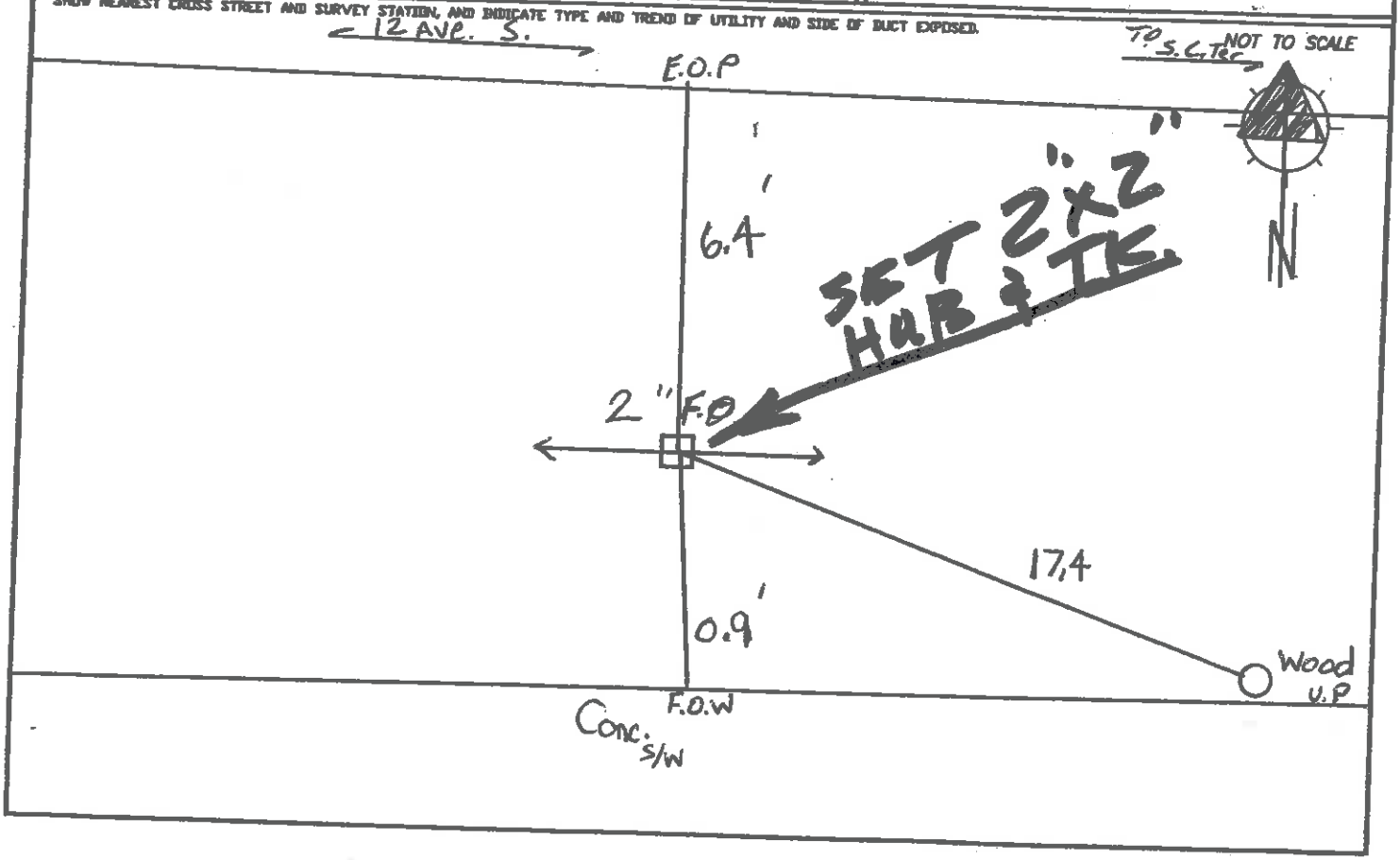
NOTES: TH also revealed 1" Irr. 0.50 South of hub. Cover; 0.57

PRELIMINARY

IMC 2



SHOW NEAREST CROSS STREET AND SURVEY STATION, AND INDICATE TYPE AND TREND OF UTILITY AND SIDE OF DUCT EXPOSED.



New Sidewalk & Water Main Replacement
From 11th Ave So to 12th Ave So

3

InfraMap CORP
Utility Locators · Surveyors · Consulting Engineers
1860 Old Okeechobee Road, Suite 201
West Palm Beach, Florida 33409
(561) 586-0790 (800) 314-8856 Fax (561) 586-1171

VACUUM TEST HOLE REPORT

PN: PF02115 TEST HOLE NO.: 3

PROJECT NAME:

LOCATE REQUESTED BY: CTA

REQUESTED: SIZE: TYPE: GAS WATER ELEC TELE CATV SAN FM STORM STEAM
OTHER:

FOUND: SIZE: 4" MATRL: CI DI STL W/STL CLAY AC RCP PCCP CMP PE PVC(GREEN) PVC(WHITE) PVC(GRAY) PVC(BLUE) COPPER CAST IN PLACE CONC. PRECAST CONC. IBC VCPX
OTHER:
TYPE: GAS WATER ELEC TELE FB CATV SAN FM STORM STEAM

D.O.T. JOB# N/A WORK ORDER# N/A.

PROJECT LOCATION: (CITY, COUNTY, STATE) Lake Worth - Palm Bch. Fl

SHEET C-3 OF PROPOSED: Utility Work

FORM BY: B.P ASSISTED BY: E.R, AG # OF HOLES: 1

PAVING CONDITION: GOOD FAIR POOR N/A DATE DUG: 10/19/15

SOIL CONDITIONS: HARD SOFT WET MOIST DRY SAND CLAY ROCKY

UTILITY CONDITION: GOOD FAIR POOR SEE NOTE

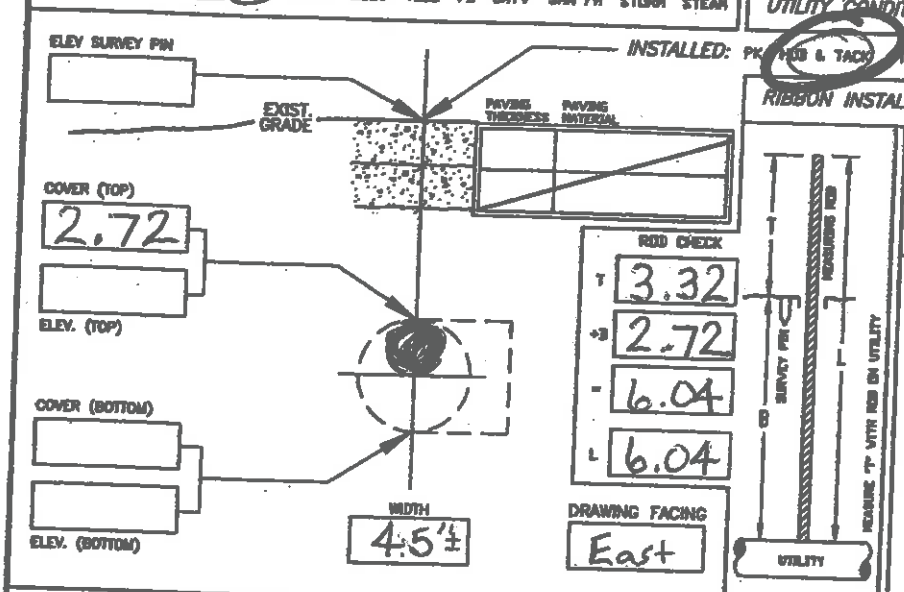
INSTALLED: PK NAIL & TACK SPIKE PIN SPIKE CHIS. "X" AT: CROWN EDGE TOP OF UTILITY.

RIBBON INSTALLED: RED BLUE YELLOW ORANGE GREEN PINK WHITE

SURVEY PIN TO BE LOCATED BY: N/A

INC READING	ROD	COVER	OFFSET	ADJUSTMENT

NOTES: ~~Fill other panel~~

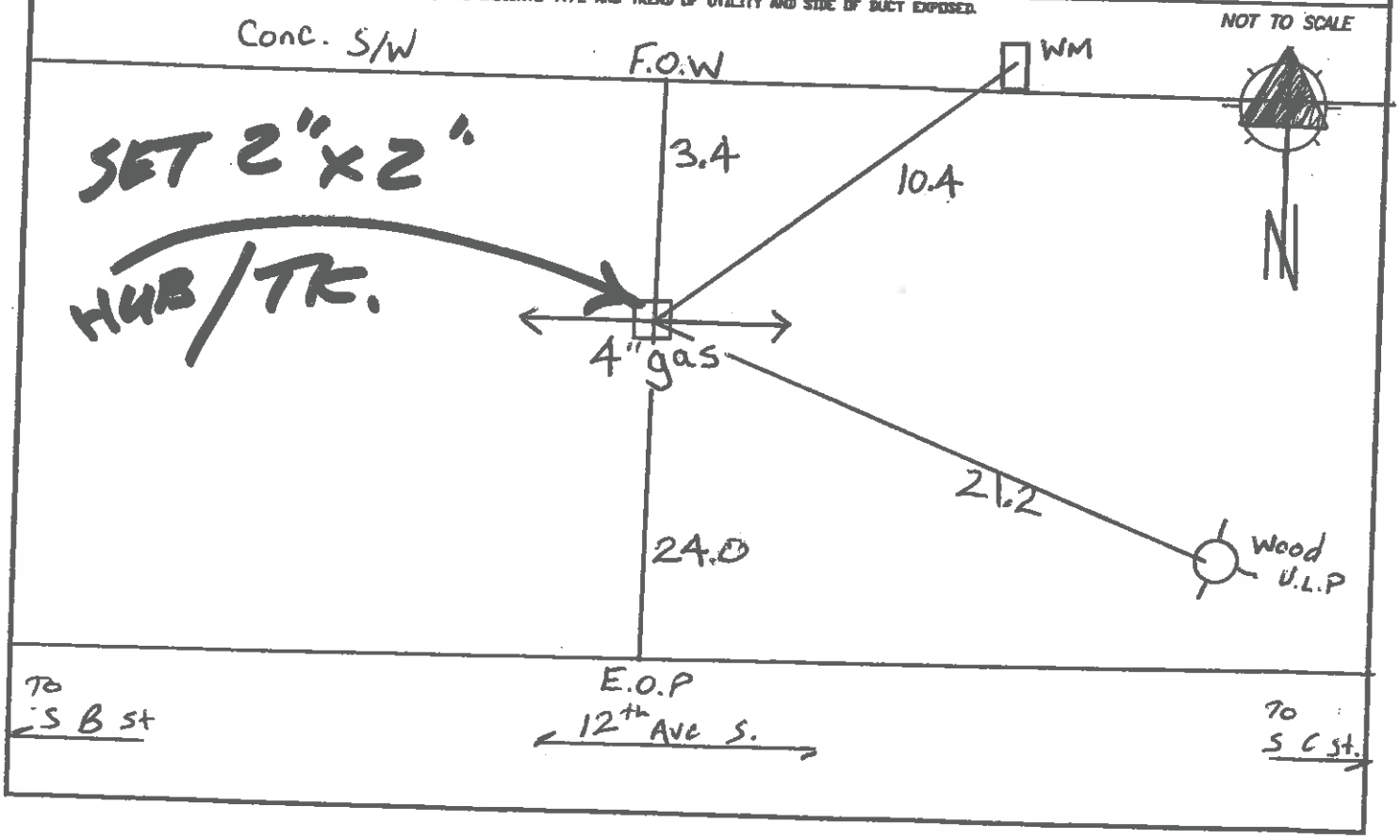


PRELIMINARY

IMC 3

SHOW NEAREST CROSS STREET AND SURVEY STATION, AND INDICATE TYPE AND TREND OF UTILITY AND SIDE OF DUCT EXPOSED.

NOT TO SCALE



[illegible] Replacement
From 11th Ave So to 12th Ave So

4

InfraMap CORP
Utility Locators · Surveyors · Consulting Engineers
1860 Old Okeechobee Road, Suite 201
West Palm Beach, Florida 33409
(561) 586-0790 (800) 314-8856 Fax (561) 586-1171

VACUUM TEST HOLE REPORT

PN: PF02115 TEST HOLE NO.: 4

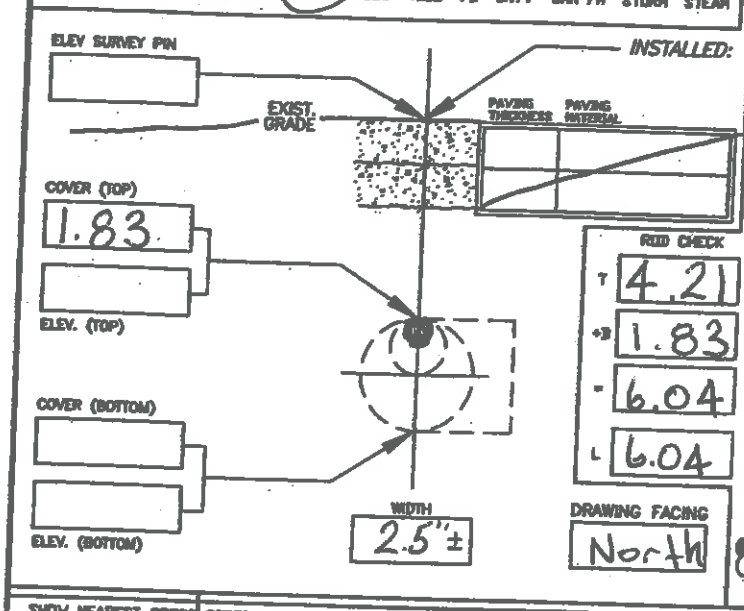
PROJECT NAME:

LOCATE REQUESTED BY: CTA

REQUESTED: SIZE: 2" TYPE: GAS (WATER) ELEC TELE CATV SAN FM STORM STEAM
OTHER:

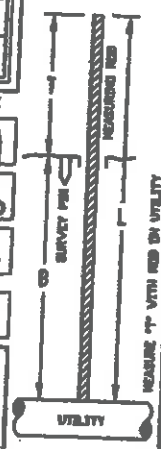
FOUND: SIZE: 2" MATRL: CI DI (STL) W/STL CLAY AC RCP PCCP CMP PE PVC(GREEN) PVC(WHITE) PVC(GRAY) PVC(BLUE) COPPER CAST IN PLACE CONC. PRECAST CONC. ZDC VCPX
OTHER:
TYPE: GAS (WATER) ELEC TELE FD CATV SAN FM STORM STEAM

D.O.T. JOB#: N/A WORK ORDER#: N/A.
PROJECT LOCATION: (CITY, COUNTY, STATE) Lake Worth - Palm Bch. Fl
SHEET C-3 OF PROPOSED: Utility Work
FORM BY: B.P ASSISTED BY: E.R, AG # OF HOLES: 1
PAVING CONDITION: GOOD FAIR POOR (N/A) DATE DUG: 10/19/15
SOIL CONDITIONS: HARD (SOFT) WET MOIST (DRY) (SAND) CLAY ROCKY
UTILITY CONDITION: (GOOD) FAIR POOR SEE NOTE
INSTALLED: PK (SUB & TACK) PIN SPIKE CHIS. "X" AT: (CROWN) EDGE TOP OF UTILITY.
RIBBON INSTALLED: RED (BLUE) YELLOW ORANGE GREEN PINK WHITE



ROD CHECK
T 4.21
+B 1.83
= 6.04
L 6.04

DRAWING FACING: North



SURVEY PIN TO BE LOCATED BY: N/A

INC READING	ROD	COVER	OFFSET	ADJUSTMENT

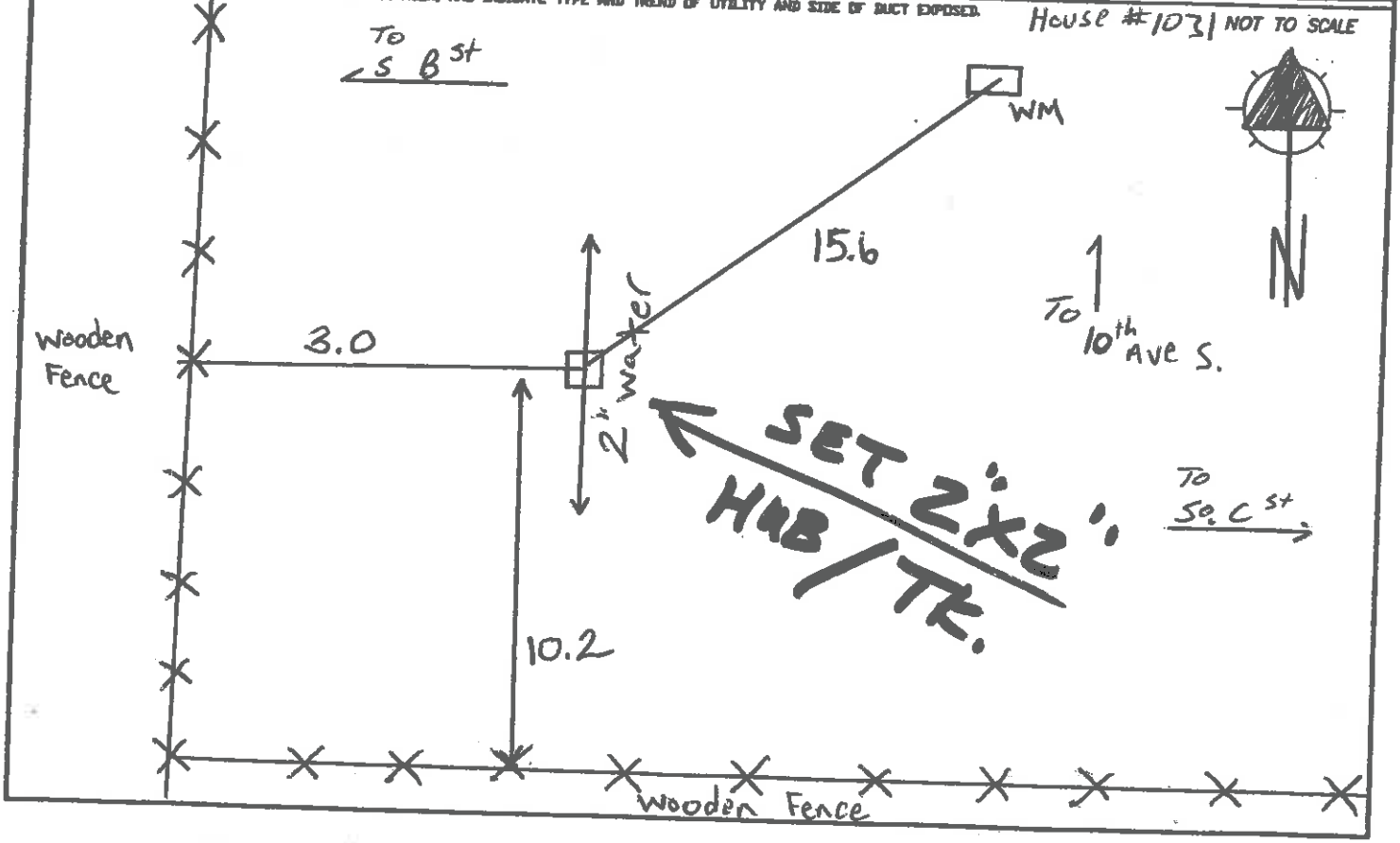
NOTES:

PRELIMINARY

IMC 4

SHOW NEAREST CROSS STREET AND SURVEY STATION, AND INDICATE TYPE AND TREND OF UTILITY AND SIDE OF DUCT EXPOSED.

House #1031 NOT TO SCALE



APPENDIX B

October 13, 2015

Craven Thompson & Associates, Inc.
3563 NW 53rd Street
Ft. Lauderdale, FL 33309-6311

Attention: Mr. Matt Cigale, P.E., LEED AP

Re: Geotechnical Engineering Services
11th Avenue South Sewer and Water Improvements
Lake Worth, Florida
TSF File No. 7111-15-305

Dear Matt:

Tierra South Florida, Inc. (TSF) has performed geotechnical data collection for the subject project. The geotechnical data collected is presented in this report. The purpose of this geotechnical data report is to provide some general information on the subsurface conditions at the subject project.

The scope of our services does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.

1. Subsurface Exploration

Project Information

We understand that the project consist of installation of new sanitary sewer and water main replacement along 11th Avenue South between South C Street and South B street in Lake Worth, Florida.

Soil Borings

The subsurface conditions within the areas was explored with one Standard Penetration Test (SPT) Boring drilled to a depth of 15 feet deep below existing grades.

The boring was located in the field by TSF personnel using hand-held GPS system and tape measurements. Approximate locations of the borings are presented in the Appendix. The samples of the in-place soils were placed in airtight jars and returned to our laboratory for classification by a

geotechnical engineer.

The boring was advanced using a CME 55 drill rig. In the borings samples of the in-place materials were obtained. The soil samples were returned to our laboratory for classification by a geotechnical engineer.

Based on a review of the Palm Beach County, Florida Soil Survey, the project location was mapped as follows:

- Paola sand, 0 to 8 percent slopes
- St. Lucie – Urban land complex

The USDA soil survey map is presented in Appendix.

The samples were visually classified in general accordance with USCS Soil Classification System. Soils encountered the below the topsoil consist of sand (SP). Soil profiles encountered in the borings are presented in the Appendix.

A geotechnical engineer bases soil stratification on a visual review of the recovered samples, laboratory testing, and interpretation of the field boring logs. The boring stratification lines represent the approximate boundaries between soil types of significantly different engineering properties; however, the actual transition may be gradual. In some cases, small variations in properties not considered pertinent to our engineering evaluation may have been abbreviated or omitted for clarity. The boring profiles represent the conditions at the particular boring location and variations do occur and should be expected among the borings.

2. Laboratory Testing

Representative soil samples collected from the SPT boring were classified and stratified in general accordance with USCS Soil Classification System. Our classification was based on visual inspection.

3. Groundwater Conditions

Groundwater was not encountered within the upper 15 feet of the boring and is indicated on the boring profiles in the Appendix.

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences (i.e. existing canals, swells, drainage ponds, under drains and areas of covered soils like, paved parking lots and sidewalks). Fluctuation should be anticipated. We recommend that the contractor determine the actual groundwater levels at the time of construction to determine groundwater impact on his construction procedure.

4. Engineering Evaluations And Recommendations

General

In general, the existing shallow subsurface soils encountered in the boring is suitable for supporting the proposed improvements after proper subgrade preparation. Site preparation should consist of normal clearing and grubbing followed by compaction of subgrade soils.

The removal of topsoil where required should be accomplished in accordance with the Florida Department of Transportation (FDOT) Standard Specifications Section 110 – Clearing and Grubbing. Backfill should consist of materials conforming to FDOT Standard Index 505 and compacted in accordance with Section 120-9 of the Standard Specification for Road and Bridge Construction, latest edition.

Excavations

All excavations should be performed in accordance with FDOT Standard Index 500, the latest Standard Specifications for Road and Bridge Construction, and in accordance with OSHA Standards. We recommend that sides of temporary excavations be sloped to 2H:1V or flatter or supported by temporary shoring.

5. Report Limitations

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted Geotechnical engineering principles and practices. This company is not responsible for the conclusions, opinions, or recommendations made by others based on this data. No other warranties are expressed or implied.

The scope of this geotechnical data collection was intended to obtain general information on the subsurface conditions for the drainage improvement. The analysis and recommendations submitted in this report are based upon the geotechnical data obtained from the soil borings performed at the locations indicated. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the planned improvements.

If you have any questions pertaining to this report, or if we may be of further service, please contact our office.

Very truly yours,

TIERRA SOUTH FLORIDA, INC.

Raj Krishnasamy, P.E.
Principal Engineer
FL. Registration No. 53567

Ramkumar Vedula, P.E.
Principal Engineer

Attachment: USDA Soil Survey Map
Location Plan/Soil Profile-Sheet 1

Soil Map—Palm Beach County Area, Florida
(11th Avenue South)

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Palm Beach County Area, Florida
Survey Area Data: Version 9, Sep 9, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 13, 2014—Dec 11, 2014

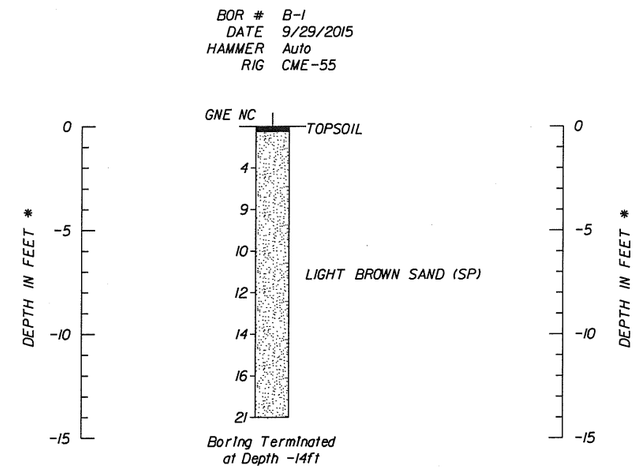
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Palm Beach County Area, Florida (FL611)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
41	St. Lucie-Paola-Urban land complex, 0 to 8 percent slopes	0.4	100.0%
Totals for Area of Interest		**0.4**	**100.0%**

BORINGS LOCATION PLAN

Approximate Location of Auger Borings



Topsoil

Sand

NOTES

▽ ENCOUNTERED GROUNDWATER TABLE

NC NUMBERS TO THE LEFT OF BORINGS INDICATE CORRECTED SPT VALUE FOR 12" PENETRATION USING AN AUTOMATIC HAMMER CORRECTION FACTOR OF 1.24

* DENOTES DEPTH IN FEET FROM EXISTING GROUND SURFACE

DRAWN BY: NG	APPROVED BY: RK	ENGINEER OF RECORD: RAJ KRISHNASAMY, P.E.	RAJ KRISHNASAMY, P.E. P.E. LICENSE NUMBER 53567 TIERRA SOUTH FLORIDA 2765 VISTA PARKWAY, S-10 WEST PALM BEACH, FL 33411 CERTIFICATE OF AUTHORIZATION 28073	SCALE: NTS	PROJECT NUMBER: 7111-15-305	GEOTECHNICAL ENGINEERING SERVICES NEW SANITARY GRAVITY SEWER INSTALLATION AND WATER MAIN REPLACEMENT LAKE WORTH, FLORIDA	Sheet: 1
CHECKED BY: JO	DATE: 10/06/2015	FLORIDA LICENSE NO.: 53567					

ngonzalez 10/7/2015 8:55:03 AM J:\Tierra Documents\Projects\TSF 2015\7111-15-305. New Sanitary Gravity Sewer Installation and Water Main Re-Placement (CTA)\borings.DGN

APPENDIX C

Notification of Acceptance of Use of a General Permit

Permittee:
Julie Parham, P.E.
Utilities Engineer
City Of Lake Worth
301 College Street
Lake worth, FL 33460
jparham@Lakeworth.org

Permit Number: 138272-208-DSGP
Issue Date: 06/23/2016
Expiration Date: 06/22/2021
County: Palm Beach
Project Name: City of Lake Worth New Sanitary Gravity Sewer Installation and Water Main Replacement
Water Supplier: City of Lake Worth
PWS ID: 4500773

Dear Ms. Parham:

On June 13, 2016 the Florida Department of Health-Palm Beach County, as an approved local program of the Florida Department of Environmental Protection, received a "*Notice of Intent to Use the General Permit for Construction of Water Main Extensions for PWSs*" [DEP Form No. 62-555.900(7)], under the provisions of Rule 62-4.530 and Chapter 62-555, Florida Administrative Code (F.A.C.). The proposed project includes:

Construct approximately 914 LF of 4" DIP water main to replace existing water main between South B Street and South C Street, from 10th Avenue South to 12th Avenue South in the City of Lake Worth, Florida.

Based upon the submitted Notice and accompanying documentation, this correspondence is being sent to advise that the Department does not object to the use of such general permit at this time. Please be advised that the permittee is required to abide by Rule 62-555.405, F.A.C., all applicable rules in Chapters 62-4, 62-550, 62-555, F.A.C., and the General Conditions for All General Drinking Water Permits (found in 62-4.540, F.A.C.).

When any existing asbestos cement (AC) pipes are replaced under this permit, the permittee shall do so in accordance with the applicable rules of the Federal Asbestos Regulation and Florida DEP requirements. For specific requirements applicable to AC pipes, the permittee should contact the Air and Waste Management section managers prior to commencing any such activities at (561) 837-5900 #3. Please be aware that a notification is required to be submitted to the Department for a regulated project.

The permittee shall comply with all sampling requirements specific to this project. These requirements are attached for review and implementation. Pursuant to Rule 62-555.345, F.A.C., the permittee shall submit a certification of construction completion [DEP Form No. 62-555.900(9)] to the Department and obtain approval, or clearance, from the Department before placing any water main extension constructed under this general permit into operation for any purpose other than disinfection or testing for leaks.

Within 30 days after the sale or legal transfer of ownership of the permitted project that has not been cleared for service in total by the Department, both the permittee and the proposed permittee shall sign and submit an application for transfer of the permit using Form 62-555.900(8), F.A.C., with the appropriate fee. The permitted construction is not authorized past the 30-day period unless the permit has been transferred.

This permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project, per Rule 62-4.030, F.A.C.

Sincerely,
For the Division Director

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

DG/JH/LM

c: Project Engineer: Matthew J. Cigale, P.E.
Utility: Same

Civil Penalty May Be Incurred
if this project is placed into operation before obtaining a clearance from this office.

Requirements for clearance upon completion of projects are as follows:

1) Clearance Form
Submission of a fully completed Department of Environmental Protection (DEP) Form 62-555.900(9) *Certification of Construction Completion and Request for Clearance to Place Permitted PWS Components into Operation.*

2) Record Drawings, if deviations were made
Submission of the portion of record drawings showing deviations from the DEP construction permit, including preliminary design report or drawings an specifications, if there are any deviations from said permit (Note that it is necessary to submit a copy of only the portion of record drawings showing deviations and not a complete set of record drawings.).

3) Bacteriological Results
Copies of satisfactory bacteriological analysis (a.k.a. Main Clearance), taken within sixty (60) days of completion of construction, from locations within the distribution system or water main extension to be cleared, in accordance with Rules 62-555.315(6), 62-555.340, and 62-555.330, F.A.C. and American Water Works Association (AWWA) Standard C 651-92, as follows:

- Connection to an existing system
- The end point of the proposed addition
- Any water lines branching off a main extension
- Every 1,200 feet on straight runs of pipe

Each location shall be sampled on two consecutive days, with sample points and chlorine residual readings clearly indicated on the report. A sketch or description of all bacteriological sampling locations must also be provided. **All samples shall be collected by an employee of a state certified laboratory or a certified operator and be reported on DEP Reporting Format 62-550.730.**

For further clarification contact:
Jay Hardman, P.E.
Florida Department of Health Palm Beach
Plan Review & Permit Section
800 Clematis Street, 4th Floor
West Palm Beach, FL 33401
561-837-5900 #5

June 23, 2016

In the Matter of an
Application for Permit by:

PERMITTEE:
Julie Parham, P.E.
Utilities Engineer
City Of Lake Worth
301 College Street
Lake worth, FL 33460
jparham@Lakeworth.org

PERMIT NUMBER: 138292-209-DWC
COUNTY: Palm Beach
PROJECT NAME: City of Lake Worth New Sanitary Gravity Sewer Installation and Water Main Replacement
WASTEWATER TREATMENT:ECRWWTF
FACILITY ID: FL0041360

NOTICE OF PERMIT ISSUANCE

Enclosed is Permit Number 138282-209-DWC to construct a domestic wastewater collection/transmission system, issued pursuant to 403.087(1), Florida Statutes.

The Department's proposed agency action shall become final unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, Florida Statutes, within fourteen days of receipt of notice. The procedures for petitioning for a hearing are set forth below.

A person whose substantial interests are affected by this permit may petition for an administrative proceeding (hearing) in accordance with Sections 120.569 and 120.57, F.S.

The petition must contain the information set forth below and must be filed (received) in this Office, Division of Environmental Public Health, Florida Department of Health Palm Beach County, 800 Clematis Street, West Palm Beach, Florida 33401. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen (14) days of receipt of this notice of permit. Petitions filed by any other person must be filed within fourteen (14) days of publication of the public notice or within fourteen days of receipt of this notice of permit whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the discretion of the presiding officer upon the filing of a motion in compliance with rule 28-5.207 of the Florida Administrative Code.

June 23, 2016

A petition must contain the following information:

a. The name, address and telephone number of each petitioner, the Permit File Number and the county in which the subject matter or activity is located;

b. A statement of how and when each petitioner received notice of the Department's action or proposed action;

c. A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

d. A statement of the material facts disputed by the petitioner, if any;

e. A statement of facts that the petitioner contends warrant reversal or modification of the Department's action or proposed action;

f. A statement of which rules or statutes the petitioner contends require reversal or modification of the Department's action; and

g. A statement of the relief sought by petitioner, stating precisely the action the petitioner wants the Department to take.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the final action of the Department may be different from the position taken by it in this permit. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation under Section 120.573 of the Florida Statutes is not available for this proceeding.
This permit is final and effective on the date filed with Clerk of the Department unless a petition is filed in accordance with the above. Upon timely filing of a petition this permit will not be effective until further Order of the Department.

Any party to the order has the right to seek judicial review of the order under Section 120.68 of the Florida Statutes, by filing a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the Clerk of the Department in this Office, Division of Environmental Public Health, Florida Department of Health Palm Beach County, 800 Clematis Street, West Palm Beach, Florida 33401; and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice of appeal must be filed within thirty (30) days from the date the final order is filed with the Clerk of the Department.

Executed in Palm Beach County, Florida.

FLORIDA DEPARTMENT OF HEALTH
PALM BEACH COUNTY

Darrel J. Graziani, P.E., R.S., Environmental Administrator
Division of Environmental Public Health
800 Clematis Street, West Palm Beach, FL 33401
(561) 837-5900

June 23, 2016

FILING AND ACKNOWLEDGMENT

FILED, on this date, under Section 120.52, Florida Statues, with the designated deputy clerk, receipt of which is hereby acknowledged.

Clerk Stamp

CERTIFICATE OF SERVICE

The undersigned hereby certifies that this NOTICE OF PERMIT ISSUANCE was mailed by certified mail and all copies were electronically sent before the close of business on June 23, 2016 to the listed persons.

[Clerk] 6/23/16 [Date]

Copies furnished to:

Matthew J. Cigale, P.E.
DIANE PUPA, FDEP

STATE OF FLORIDA
DOMESTIC WASTEWATER COLLECTION/TRANSMISSION INDIVIDUAL PERMIT

PERMITTEE:
Julie Parham, P.E.
Utilities Engineer
City Of Lake Worth
301 College Street
Lake worth, FL 33460
jparham@Lakeworth.org

PERMIT NUMBER: 138272-209-DWC
ISSUANCE DATE: June 23, 2016
EXPIRATION DATE: June 22, 2021
COUNTY: Palm Beach
PROJECT NAME: City of Lake Worth New Sanitary Gravity Sewer Installation and Water Main Replacement
WASTEWATER TREATMENT: ECRWWTF
FACILITY ID: FL0041360

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Chapters 62-4 and 62-604, Florida Administrative Code (F.A.C.).

The above named permittee is hereby authorized to construct the facilities shown on the application and other documents on file with the Department and made a part hereof and specifically described as follows:

DESCRIPTION OF PROJECT:

Construct approximately 361 LF of 8" gravity sewer, two (2) manholes, one (1) lift station and approximately 80 LF of 2" force main to serve eleven (11) residential units and a church.

LOCATION OF PROJECT:

Between South B Street and South C Street, from 10th Avenue South to 12th Avenue South in the City of Lake Worth, Florida

IN ACCORDANCE WITH: The limitations, requirements and other conditions set forth in pages 1 through 2 of this permit.

PERMIT CONDITIONS:

1. This permit is subject to the general conditions of Rule 62-4.160, F.A.C., as applicable. This rule is available at the FDEP's Internet site at: http://www.dep.state.fl.us/water/rulesprog.htm#ww [62-4.160]

2. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Florida Department of Health Palm Beach County DEP DEP Form 62-604.300(8)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the FDEP's Internet site at: http://www.dep.state.fl.us/water/wastewater/forms.htm [62-604.700(2)]

3. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. [62-604.700(3)]

4. Permit revisions shall only be made in accordance with Rule 62-4.050(4)(s), F.A.C. Request for revisions shall be made to the Department in writing and shall include the appropriate fee. Revisions not covered under Rule 62-4.050(4)(s), F.A.C., shall require a new permit. [62-604.600(8)]

5. Abnormal events shall be reported to the Florida Department of Health- Palm Beach County **(561) 837-5900 during business hours; all other times (561) 471-2502** in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER, (800) 320-0519, as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Florida Department of Health- Palm Beach County Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. [62-604.550]

6. This permit is for CONSTRUCTION ONLY of the collection/transmission system project. This permit does not authorize the connection of this collection/transmission system project to the designated wastewater treatment plant. This permit shall not be construed to infer that the clearance necessary for connection shall be granted. Any such clearance shall be granted only when reasonable assurance is given that adequate treatment and disposal is available in accordance with Department rules, regulations, and permits. Partial clearance may be granted, if required. [62-604.130(1) and 62-604.600(7)]

Executed in *Palm Beach County, Florida.*

FLORIDA DEPARTMENT OF HEALTH
PALM BEACH COUNTY

Timothy G. Mayer, R.S., MPH, Director,
Division of Environmental Health

DATE: *June 23, 2016*