

**SPECIFICATIONS &
CONTRACT DOCUMENTS
FOR
CITY OF PANAMA CITY BEACH
“LIFT STATION #21 IMPROVEMENTS”**



CITY OF PANAMA CITY BEACH
110 SOUTH ARNOLD ROAD
PANAMA CITY BEACH, FLORIDA 32413

September 2018

RELEASED FOR BID

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SECTION 00010

ADVERTISEMENT FOR BIDS

NOTICE TO RECEIVE SEALED BIDS

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

This project includes the partial demolition and rehabilitation of an existing duplex, submersible-style lift station, associated piping, bypass pumping and sitework. Quantities are subject to change. The Contractor shall provide all materials, equipment and labor to complete the project.

Plans and specifications will be available on September 27, 2018 and can be obtained or examined at the City of Panama City Beach Utilities Department at 116 South Arnold Road, Panama City Beach, Florida 32413. The bid must conform to Section 287.133(3) Florida Statutes, with respect to Public Entity Crimes.

There will be no cost for Plans and Specifications (digital copy only on CD). Partial sets will NOT be issued.

Bids will be received until **2:00 p.m. Central Time, October 30, 2018 at City of Panama City Beach City Hall, 110 South Arnold Road, Panama City Beach, Florida, 32413** and will be opened and read publicly immediately thereafter. All Bids shall be submitted in an envelope clearly marked “Sealed Bid – Panama City Beach Lift Station #21 Improvements” – A Bid Bond in the amount of 5% of the total amount of the Bid shall accompany the Bid. The City of Panama City Beach (“City”) reserves the right to reject any and all Bids. All Bids shall be firm (including all labor and material prices) for a period of 30 days after opening.

The City shall award the Contract to the lowest responsive and responsible bidder; provided, however, the City reserves the right to award the Contract to a Bidder who is not the lowest responsive and responsible bidder if the City determines in its reasonable discretion that another Bid offers the City a better value based upon the reliability, quality of service, or product of such other Bidder.

There will not be a pre-bid conference for this project. Point of Contact will be Mark Shaeffer, P.E., City of Panama City Beach Utilities Department; 110 South Arnold Road, Panama City Beach, Florida, 32413 Email mshaeffer@pcbgov.com. Telephone (850)230-5054, extension 2321 or Fax (850) 230-5116. Each bidder must comply with all applicable state and local laws concerning licensing, registration, and regulations of contractors doing business in Florida.

Advertisement Dates: September 27th and October 4th, 2018.

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

Notice to Publisher – Please forward the original “Proof of Publication” and the invoice to:

City of Panama City Beach
110 South Arnold Road
Panama City Beach, Florida 32413

[END OF SECTION 00010]

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

SECTION 00020

INFORMATION FOR BIDDERS

BIDS will be received by City of Panama City Beach City Hall (herein called the "OWNER"), at **2:00 p.m. Central Time, October 30, 2018 at City of Panama City Beach City Hall, 110 South Arnold Road, Panama City Beach, Florida, 32413** then opened and read publicly promptly thereafter.

Each BID must be submitted in a sealed envelope addressed to City of Panama City Beach, **2:00 p.m. Central Time, October 30, 2018 at City of Panama City Beach City Hall, 110 South Arnold Road, Panama City Beach, Florida, 32413**. Each sealed envelope containing a BID must be plainly marked on the outside as "**SEALED BID Panama City Beach – LIFT STATION #21 IMPROVEMENTS.**" and the envelope should bear on the outside the BIDDER'S name, address and license number if applicable, and the name of the project for which the BID is submitted. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the OWNER - City of Panama City Beach, at 110 South Arnold Road, Panama City Beach, Florida 32413)].

All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. **Two original BID forms are required.**

A complete BID response shall consist of:

1. An executed Bid Proposal Form – Section 00030
2. The required Bid Bond – Section 00040
3. An executed copy of the Statement Under Section 287.087, Florida Statutes, On Preference To Businesses With Drug-Free Workplace Programs – Section 0095
4. An executed copy of the Trench Safety Act Compliance Document – Section 00096
5. An executed copy of the Public Entity Crimes Statement – Section 00097
6. Copies of all Addenda signed by Bidder evidencing receipt

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn by the BIDDER prior to the above scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered, no exceptions. No BIDDER may withdraw a BID within 30 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period the time may be extended by mutual agreement between the OWNER and the apparent successful BIDDER.

This is a Lump Sum Contract. BIDDERS must satisfy themselves of the accuracy of any estimated quantities in the BID Schedules or Contract Documents by examination

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of the site and a review of the drawings and specifications including any ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done. **The CONTRACTOR shall visit the entire site before submitting a BID.**

The OWNER shall provide to BIDDERS prior to BIDDING, information which is pertinent to, and delineates and describes, the land upon which the WORK is to be performed, including its ownership and rights-of-way acquired or to be acquired.

If necessary, ADDENDA will be issued to the Contract Documents. The BIDDERS must submit all questions, if any, in writing at least seven (7) days prior to the BID date.

The CONTRACT DOCUMENTS contain the provisions required for construction of the WORK. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the successful BIDDER or relieve the successful BIDDER from fulfilling all of their obligations under the contract.

No Bid shall be considered or accepted unless at the time the Bid is submitted to OWNER the same shall be accompanied by a cashiers check, a cash bond posted with the City Clerk, a certified check payable to Owner on some bank or trust company located in the State of Florida insured by the Federal Deposit Insurance Corporation, or Bid Bond, in an amount not less than 5% of **the bidder's maximum possible award (base bid plus all add alternates)** (collectively referred to herein as the "Bid Deposit"). The Bid Deposit shall be retained by Owner as liquidated damages if the successful Bidder fails to execute and deliver to Owner the unaltered Agreement, or fails to deliver the required Performance and Payment Bonds or Certificates of Insurance, all within ten (10) calendar days after receipt of the Notice of Award. Bid Bonds shall be executed by a corporate surety licensed under the laws of the State of Florida to execute such bonds, with conditions that the surety will, upon demand, forthwith make payment to Owner upon said bond.

As soon as the BID prices have been compared, the OWNER will return the BID DEPOSITS (if requested) of all except the three lowest responsive and responsible (or best value as hereafter provided) BIDDERS. When the required Agreement has been executed by the successful BIDDER and delivered to OWNER, together with the required Certificate(s) of Insurance, Performance Bond and Payment Bond, the BID DEPOSITS of the successful BIDDER and two remaining unsuccessful BIDDERS will be returned (if requested).

A PERFORMANCE BOND and a PAYMENT BOND each in the amount of 100 percent of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract.

Attorneys-in-fact who sign BID BONDS or PAYMENT BONDS and PERFORMANCE BONDS must file with each BOND a certified and effective dated copy of their power of attorney.

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The party to whom the contract is awarded will be required to obtain the required insurance, PAYMENT BOND and PERFORMANCE BOND, execute the AGREEMENT and deliver to OWNER said executed AGREEMENT together with the required Certificate of Insurance and the PERFORMANCE BOND and PAYMENT BOND, within ten (10) calendar days after the date the NOTICE OF AWARD is delivered to the BIDDER; the required forms for such AGREEMENT being set forth in Section 00050, the required form for the PERFORMANCE BOND being set forth in Section 00060, the required form for the PAYMENT BOND being set forth in Section 00070 and the required form for the Certificate of Insurance being set forth in Section 00099. In case of failure of the successful BIDDER to execute and deliver to OWNER, within said ten (10) day period the required AGREEMENT, together with the required Certificates of Insurance, PERFORMANCE BOND and PAYMENT BOND, the OWNER may consider the BIDDER in default, in which case the entire amount of the BID DEPOSIT accompanying the BID shall be paid to the OWNER. The BID DEPOSIT shall be retained by Owner as liquidated damages if the successful Bidder fails to execute and deliver to Owner the unaltered Agreement, or fails to deliver the required Performance and Payment Bonds or Certificate(s) of Insurance, all within ten (10) calendar days after receipt of the Notice of Award.

If the OWNER intends to accept the successful BIDDER'S BID and enter into the contract with them, the OWNER, within thirty (30) days or such longer period of time the OWNER and successful BIDDER may mutually agree to in writing) of receipt of an acceptable PERFORMANCE BOND, PAYMENT BOND, Certificate(s) of Insurance, and AGREEMENT signed by the successful BIDDER to whom the AGREEMENT was awarded, shall sign the AGREEMENT and return to such party an executed duplicate of the AGREEMENT. BIDDER acknowledges and agrees that unless and until the OWNER executes the AGREEMENT and returns the executed copy to the BIDDER, no contract or agreement between the OWNER and BIDDER shall exist. Should the OWNER not execute the AGREEMENT within such period, the BIDDER shall provide OWNER an additional seven days written notice of BIDDER'S intent to withdraw its signed copy of the AGREEMENT. If OWNER fails to execute the AGREEMENT within such seven days, the AGREEMENT shall be deemed withdrawn and BIDDER shall be released from its BID as of the date of the written notice.

The OWNER or its agents may make such investigations as deemed necessary to determine the ability of each BIDDER to perform the WORK, and the BIDDER shall furnish to the OWNER and its agents all such information and data for this purpose as the OWNER or its agents may request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the AGREEMENT and to complete the WORK contemplated therein.

A conditional or qualified BID may be rejected by OWNER.

The OWNER shall award the Contract to the lowest responsive and responsible BIDDER as determined by OWNER; provided, however, OWNER reserves the right to

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award the Contract to a BIDDER who is not the lowest responsive and responsible BIDDER if OWNER determines in its reasonable discretion that another BID offers OWNER a better value based upon the reliability, quality of service, or product of such other BIDDER. In the event OWNER awards the Contract to a BIDDER other than the lowest responsive and responsible BIDDER, OWNER shall state the basis upon which the award is being made.

Each BIDDER may attach to its BID any information or documentation it believes is relevant to addressing the factors of reliability, quality of service and product, as such factors pertain to the WORK to be provided under the AGREEMENT to be awarded pursuant to this Information for Bidders. Any such information or documentation is to consist of no more than 12 pages, single sided, each page no larger than 8" x 11". OWNER reserves the right, either before or after BID opening, but prior to contract award, to request from any BIDDER such information or documentation addressing the factors of reliability, quality of service or product, as OWNER may determine is reasonably necessary to assist it in deciding which bid offers OWNER the better value. Further, each BIDDER by submitting its BID is deemed to have authorized OWNER to conduct such investigations as OWNER may determine are reasonably necessary to assist it in deciding which BID offers OWNER the better value. OWNER in making any decision as to which BID offers OWNER the better value may rely upon any such information or documentation provided by a BIDDER, and by submitting any such information or documentation, upon request from OWNER, the BIDDER will be deemed to have certified and warranted to OWNER the accuracy and correctness of any such information and documentation. Further, in making any decision as to which BID offers OWNER the better value, OWNER also may rely upon its own investigations or its own records and knowledge concerning the BIDDER, including the BIDDER's personnel, work product and prior work history. All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the WORK shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the AGREEMENT, PLANS, SPECIFICATIONS, and other CONTRACT DOCUMENTS, prior to submitting their BID. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to its BID.

The successful BIDDER of each contract shall supply the names and addresses of major material SUPPLIERS and SUBCONTRACTORS when required to do so by the OWNER.

Each BIDDER shall provide a separate line item in their BID identifying the cost of compliance with the applicable trench safety standards set forth in the Trench Safety Act.

END OF SECTION 00020

SECTION 00030

BID PROPOSAL FORM

This proposal of _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____, doing business as _____ (a corporation, a partnership or an individual), whose Florida contractor's license number is _____ is hereby submitted to the CITY OF PANAMA CITY BEACH (hereinafter called "OWNER").

In compliance with the requirements of the Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the **LIFT STATION #21 IMPROVEMENTS** project in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID, each party thereto certifies as to its own organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under the CONTRACT DOCUMENTS within ten (10) calendar days after the NOTICE TO PROCEED to be issued by Owner in writing and achieve Substantial Completion of the WORK within the following completion schedule in consecutive calendar days thereafter.

<u>Completion Milestone</u>	<u>Calendar Days Following Notice to Proceed</u>
Construct all improvements for Lift Station 21	120

Final Completion of the WORK shall be achieved by BIDDER within the calendar days specified in the General Conditions after the date of Substantial Completion.

BIDDER further agrees to pay as liquidated damages, the sum of \$250 for each calendar day that expires after the Contract Time for Substantial Completion as more

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fully set forth in Section 15 of the General Conditions. Liquidated damages can accrue concurrently.

BIDDER acknowledges receipt of the following ADDENDUM:

Addendum No. _____
Addendum No. _____
Addendum No. _____

BASE BID

BIDDER agrees to perform all the WORK described in the CONTRACT DOCUMENTS for the following lump sum (Total Base Bid from Page 00030-3):

_____.

Total Additive Alternate 1: _____

The BIDDER proposes and agrees, if this Proposal is accepted, to contract with the OWNER in the required form of the Agreement, Section 00050, to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor necessary to complete the WORK in full and in accordance with the shown, noted, described and reasonably intended requirements of the CONTRACT DOCUMENTS according to the following schedule:

PANAMA CITY BEACH – COLONY CLUB LIFT STATION 8 AND 18 REPLACEMENT

BID SCHEDULE

BASE BID

Item No.	Description	Unit	Quantity	Unit Price	Cost
BASE BID					
GENERAL					
1	Mobilization/Demobilization (Not to exceed 3% of the total base bid)	LS			\$
2	Bonds and Insurance (not to exceed 2% of the total base bid)	LS			\$
3	Prevention, Control and Abatement of Erosion and Water Pollution	LS			\$
4	Surveying, Record Drawings and O&M Manuals (Not to exceed 1.5% of the total base bid)	LS			\$
5	Selective Demolition of Lift Station 21 and Salvage of Components Indicated	LS			\$
6	Sitework for Lift Station 21	LS			\$
7	Construct Proposed Lift Station 21, Wetwell Top Slab, Hatches, Pump, Control & RTU Panels, Valve Vault, Piping, All Electrical, Etc.	LS			\$
8	Construct All Other Improvements for Lift Station 21	LS			\$
9	Testing Allowance	Allowance			\$ 2,000.00
10	Permit Fee Allowance	Allowance			\$ 500.00
11	Gulf Power Allowance	Allowance			\$ 2,000.00
12	Hold Harmless	LS			\$ 10.00
TOTAL BASE BID					
ADDITIVE ALTERNATE					
1	Furnish and Install High Performance Protective Coating (Spectrashield) on Lift Station 21 Interior	LS			\$
TOTAL ADDITIVE ALTERATE 1					\$

- BIDS shall include sales tax and all other applicable taxes and fees. The OWNER may elect to utilize the Sales Tax Exemption Addendum (Section

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- 00098) for material at its sole discretion.
2. BIDS shall be on the basis of a lump sum price as noted above, and shall be the total compensation to be paid by OWNER for the complete WORK. Final contract value will be adjusted based upon actual cost of allowance items.
 3. Bid unit prices and quantities, shall be applicable for any revisions to the WORK (either additions or omissions). In addition, these unit prices and quantities shall be reflected in the Schedule of Values as specified in the General Conditions. All unit prices are understood to include all associated charges for layout, insurance, taxes, field office and supervision, overhead and profit, bonds and miscellaneous items.
 4. The OWNER reserves the right to reject any and all bids received.
 5. **Failure to insert a bid amount for any item in the Bid Schedule will be considered grounds for the OWNER to determine the BID is non-responsive. Total Base Bid shall prevail for the lump sum bid amount.**
 6. By submitting this BID, the BIDDER and the BID BOND surety, are deemed to have stipulated and agreed that any and all claims, demands, actions or suits whatsoever, arising under this BID and/or BID BONDS, shall be subjected to the sole and exclusive jurisdiction and venue of the Circuit Court of Bay County, Florida. The BIDDER and BID BOND surety do agree, by submittal of this BID, that the sole and exclusive jurisdiction and venue in said forum is proper and appropriate since performance of the underlying contract to be awarded is to be accomplished within Bay County, Florida.

Bidder's Certification

BIDDER certifies that it has thoroughly familiarized itself with and inspected the site and has read and is thoroughly familiar with the CONTRACT DOCUMENTS. Additional site investigation, if deemed necessary by the BIDDER, shall be performed prior to BID submittal at the BIDDER's sole expense. Bidder certifies that the BID submitted is complete and is sufficient for the Bidder to provide a fully operational and working system in accordance with the CONTRACT DOCUMENTS. Furthermore, BIDDER certifies its understanding that neither the OWNER, PROJECT REPRESENTATIVE, nor ENGINEER shall provide any labor, equipment or materials of any kind, which may be required for the performance of the WORK, unless otherwise specifically directed by OWNER. Likewise, BIDDER certifies that it shall provide all equipment, materials, labor and services necessary to complete the WORK in accordance with the CONTRACT DOCUMENTS whether or not such equipment, material, labor, or service is expressly identified. Such occurrences are deemed subsidiary obligations of the contract for which complete compensation is made under the Lump Sum. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to its BID.

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As required, the following documents are submitted with this Bid Proposal:

1. Bid Bond – Section 00040
2. Executed Statement Under Section 287.087, Florida Statutes, On Preference To Businesses With Drug-Free Workplace Programs – Section 0095
3. Executed Trench Safety Act Compliance Document – Section 00096
4. Executed Public Entity Crimes Statement – Section 00097
5. All acknowledged Addenda
6. Sales Tax Exemption Addendum – 00808

CONTRACTOR:

Address

Phone Number

Date

[END OF SECTION 00030]

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SECTION 00040

BID BOND

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned,

_____, as Principal, and _____,

as Surety, are hereby held and firmly bound unto the City of Panama City Beach, as

OWNER, in the penal sum of _____

for the payment of which, will and truly be made, we hereby jointly and severally bind

ourselves, successors and assigns. Signed this ____ day of _____, 20__.

The Condition of the above obligation is such that whereas the principal has submitted

to the OWNER a certain BID, attached hereto and hereby made a part hereof to enter

into a contract in writing, for the construction of the Lift Station #21 Improvements

project.

NOW THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver the Agreement in the form of contract as set forth in Section 00050 (properly completed in accordance with said BID) and shall furnish a BOND for faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform its obligations created by OWNER's acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.
- (c) NOW, THEREFORE, if the OWNER shall accept the BID of the Principal and the Principal shall execute and deliver to OWNER the required Agreement and within ten days after the date of a written Notice of Award in accordance with the terms of such BID, and within said ten days deliver to OWNER the required Certificates(s) of Insurance, together with the required

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Performance and Payment Bonds in an amount of 100% the total Contract Amount as specified in the Bidding Documents or Contract Documents with good and sufficient surety for the faithful performance of the Agreement and for the prompt payment of labor, materials and supplies furnished in the prosecution thereof or, in the event of the failure of the Principal to execute and deliver to OWNER such Agreement or to give such bond or bonds, and deliver to OWNER the required certificates of insurance, if the Principal shall pay to OWNER the fixed penal sum of \$ [REDACTED] noted above as liquidated damages, and not as a penalty, as provided in the Instructions for Bidders, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may have to accept said BID; and Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Principal

Surety

By:

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Florida.

[END OF SECTION 00040]

SECTION 00050

AGREEMENT

THIS AGREEMENT is made this ____ day of _____, 2018 by and between THE CITY OF PANAMA CITY BEACH, FLORIDA, (hereinafter called "OWNER") and _____, doing business as a _____ (an individual), or (a partnership), or (a corporation), having a business address of _____ (hereinafter called "CONTRACTOR") , for the performance of the Work (as that terms is defined below) in connection with the construction of **LIFT STATION #21 IMPROVEMENTS** ("Project"), to be located at the City of Panama City Beach, Florida, in accordance with the Drawings and Specifications prepared by the City of Panama City Beach, the Engineer of Record (hereinafter called "Engineer") and all other Contract Documents hereafter specified.

OWNER and CONTRACTOR, for the consideration herein set forth, agree as follows:

1. The CONTRACTOR shall furnish, at its sole expense, all supervision, labor, equipment, tools, material, and supplies to properly and efficiently perform all of the work required under the Contract Documents and shall be solely responsible for the payment of all taxes, permits and license fees, labor fringe benefits, insurance and bond premiums, and all other expenses and costs required to complete such work in accordance with this Agreement (collectively the "Work"). CONTRACTOR'S employees and personnel shall be qualified and experienced to perform the portions of the Work to which they have been assigned. In performing the Work hereunder, CONTRACTOR shall be an independent contractor, maintaining control over

and having sole responsibility for CONTRACTOR'S employees and other personnel. Neither CONTRACTOR, nor any of CONTRACTOR'S sub-

contractors or sub-subcontractors, if any, nor any of their respective employees or personnel, shall be deemed servants, employees, or agents of OWNER.

2. The CONTRACTOR will commence the Work required by the Contract Documents within ten (10) calendar days after the date of the NOTICE TO PROCEED to be issued by OWNER in writing within thirty (30) calendar days from the date of this Agreement and will achieve Substantial Completion of the Work within of the required commencement date as follows, except to the extent the period for Substantial Completion is extended pursuant to the terms of the Contract Documents (“Contract Time”):

<u>Completion Milestone</u>	<u>Calendar Days Following Notice to Proceed</u>
Construct all improvements for proposed Lift Station 21	90

Final Completion of the Work shall be achieved by CONTRACTOR within the time period set forth in Section 15.2 of Section 00100, General Conditions.

3. The CONTRACTOR agrees to pay the OWNER, as liquidated damages, the sum of \$500 for each calendar day that expires after the Contract Time for Substantial Completion for Lift Station 8 and \$250 for each calendar day that expires after the Contract Time for Substantial Completion for Lift Station 18 as more fully set forth in Section 15 of the General Conditions. Liquidated damages can accrue concurrently.
4. The CONTRACTOR agrees to perform all of the Work described in the

Contract Documents and comply with the terms therein for the sum of \$527,069.00 as shown in the BID SCHEDULE, included within the Bid Proposal Form, as said amount may be hereafter adjusted pursuant to the terms of the Contract Documents (“Contract Price”).

5. The term "Contract Documents" means and includes the following documents, all of which are incorporated into this Agreement by this reference:

Section 00010	ADVERTISEMENT FOR BIDS
Section 00020	INFORMATION FOR BIDDERS
Section 00030	BID PROPOSAL FORM
Section 00040	BID BOND
Section 00050	AGREEMENT
Section 00060	PERFORMANCE BOND
Section 00070	PAYMENT BOND
Section 00080	NOTICE OF AWARD
Section 00090	NOTICE TO PROCEED
Section 00095	STATEMENT UNDER SECTION 287.087, FLORIDA STATUTES, ON PREFERENCE TO BUSINESSES WITH DRUG-FREE WORKPLACE PROGRAMS
Section 00096	TRENCH SAFETY ACT CERTIFICATE OF COMPLIANCE
Section 00097	PUBLIC ENTITY CRIMES STATEMENT
Section 00099	CERTIFICATE OF INSURANCE
Section 00100	GENERAL CONDITIONS
Section 00800	SUPPLEMENTAL CONDITIONS

DRAWINGS prepared by the City of Panama City Beach (civil/mechanical) and Baskerville Donovan, Inc. (electrical) Numbered G-000 through E-003 and dated September 2018.

SPECIFICATIONS prepared or issued by the City of Panama City Beach
Dated September 2018.

ADDENDA

No. _____, dated _____, 20____

No. _____, dated _____, 20____

No. _____, dated _____, 20____

The Contract Documents also includes any written amendments to any of the above signed by the party to be bound by such amendment. The Contract Documents are sometimes referred to herein as the "Agreement".

6. The OWNER will pay the Contract Price to the CONTRACTOR in the manner and at such times as set forth in Contract Documents.
7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.
8. This Agreement shall be governed by the laws of the State of Florida.
9. All notices required or made pursuant to this Agreement shall be in writing and, unless otherwise required by the express terms of this Agreement, may be given either (i) by mailing same by United States mail with proper postage affixed thereto, certified, return receipt requested, or (ii) by sending same by Federal Express, Express Mail, Airborne, Emery, Purolator or other expedited mail or package delivery, or (iii) by hand delivery to the appropriate address as herein provided. Notices to OWNER required hereunder shall be directed to the following address:

If to Owner:

City of Panama City Beach

110 South Arnold Road

_____ Panama City Beach, FL 32413
ATTENTION: _____ Mario Gisbert, City Manager
Fax No.: _____ (850) 233-5108

If to Contractor:

ATTENTION: _____
Fax No.: _____

Either party may change its above noted address by giving written notice to the other party in accordance with the requirements of this Section.

10. CONTRACTOR recognizes that OWNER is exempt from sales tax and may wish to generate sales tax savings for the Project. Accordingly, to the extent directed by and without additional charge to OWNER, CONTRACTOR shall comply with and fully implement the sales tax savings program as more fully described in the Sales Tax Exemption Addendum. If required by OWNER, the Sales Tax Exemption Addendum shall be made a part of the Contract Documents, the form of which is set forth in Section 00808.
11. The failure of OWNER to enforce at any time or for any period of time any one or more of the provisions of the Agreement shall not be construed to be and shall not be a continuing waiver of any such provision or provisions or of its right thereafter to enforce each and every such provision.
12. Each of the parties hereto agrees and represents that the Agreement comprises the full and entire agreement between the parties affecting the Work contemplated, and no other agreement or understanding of any nature concerning the same has been entered into or will be recognized, and that all negotiations, acts, work performed, or payments made prior to the execution

hereof shall be deemed merged in, integrated and superseded by this Agreement.

13. Should any provision of the Agreement be determined by a court with jurisdiction to be unenforceable, such a determination shall not affect the validity or enforceability of any other section or part thereof.
14. Unless the context of this Agreement otherwise clearly requires, references to the plural include the singular, references to the singular include the plural. The term “including” is not limiting, and the terms “hereof”, “herein”, “hereunder”, and similar terms in this Agreement refer to this Agreement as a whole and not to any particular provision of this Agreement, unless stated otherwise. Additionally, the parties hereto acknowledge that they have carefully reviewed this Agreement and have been advised by counsel of their choosing with respect thereto, and that they understand its contents and agree that this Agreement shall not be construed more strongly against any party hereto, regardless of who is responsible for its preparation.
15. For this Project, OWNER has designated a Project Representative to assist OWNER with respect to the administration of this Agreement. The Project Representative to be utilized by OWNER for this Project, shall be Mr. Mark E. Shaeffer, P.E. – Utilities Engineer.
16. CONTRACTOR acknowledges and agrees that no interruption, interference, inefficiency, suspension or delay in the commencement or progress of the Work from any cause whatever, including those for which the OWNER, PROJECT REPRESENTATIVE, or ENGINEER may be responsible, in whole or in part, shall relieve CONTRACTOR of its duty to perform or give rise to any right to damages or additional compensation from OWNER.

CONTRACTOR expressly acknowledges and agrees that it shall receive no damages for delay. CONTRACTOR's sole remedy, if any, against OWNER will be the right to seek an extension to the Contract Time; provided, however, the granting of any such time extension shall not be a condition precedent to the aforementioned "No Damage For Delay" provision. This section shall expressly apply to claims for early completion, as well as to claims based on late completion. Notwithstanding the foregoing, if the Work is delayed due to the fault or neglect of OWNER or anyone for whom OWNER is liable, and such delays have a cumulative total of more than 90 calendar days, CONTRACTOR may make a claim for its actual and direct delay damages accruing after said 90 calendar days as provided in Section 00805 Supplemental Conditions, Contract Claims and Changes. Except as expressly set forth in this section, in no event shall OWNER be liable to CONTRACTOR whether in contract, warranty, tort (including negligence or strict liability) or otherwise for any acceleration, soft costs, lost profits, special, indirect, incidental, or consequential damages of any kind or nature whatsoever.

17. INSURANCE - BASIC COVERAGES REQUIRED

The CONTRACTOR shall procure and maintain the following described insurance on policies and with insurers acceptable to OWNER. Current Insurance Service Office (ISO) policies, forms, and endorsements or equivalents, or broader, shall be used where applicable.

These insurance requirements shall not limit the liability of the CONTRACTOR. The insurance coverages and limits required of CONTRACTOR under this Agreement are designed to meet the minimum requirements of OWNER and the OWNER does not represent these types or

amounts of insurance to be sufficient or adequate to protect the CONTRACTOR'S interests or liabilities. CONTRACTOR alone shall be responsible to the sufficiency of its own insurance program.

The CONTRACTOR and the CONTRACTOR'S subcontractors and sub-subcontractors shall be solely responsible for all of their property, including but not limited to any materials, temporary facilities, equipment and vehicles, and for obtaining adequate and appropriate insurance covering any damage or loss to such property. The CONTRACTOR and the CONTRACTOR'S sub-contractors and sub-subcontractors expressly waive any claim against OWNER arising out of or relating to any damage or loss of such property, even if such damage or loss is due to the fault or neglect of the OWNER or anyone for whom the OWNER is responsible. The CONTRACTOR is obligated to include, or cause to be included, provisions similar to this paragraph in all of the CONTRACTOR'S subcontracts and its subcontractors' contracts with their sub-subcontractors.

The CONTRACTOR'S deductibles/self-insured retention's shall be disclosed to OWNER and are subject to OWNER'S approval. They may be reduced or eliminated at the option of OWNER. The CONTRACTOR is responsible for the amount of any deductible or self-insured retention

applicable to any claim or loss shall be the responsibility of CONTRACTOR and shall not be greater than \$25,000, unless otherwise agreed to, in writing, by OWNER.

Insurance required of the CONTRACTOR or any other insurance of the CONTRACTOR shall be considered primary, and insurance of OWNER shall be considered excess, as may be applicable to claims or losses which arise

out of the Hold Harmless, Payment on Behalf of OWNER, Insurance, Certificates of Insurance and any Additional Insurance provisions of this agreement, contract or lease.

WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY INSURANCE COVERAGE

The CONTRACTOR shall purchase and maintain workers' compensation and employers' liability insurance for all employees engaged in the Work, in accordance with the laws of the State of Florida, and, if applicable to the Work, shall purchase and maintain Federal Longshoremen's and Harbor Workers' Compensation Act Coverage. Limits of coverage shall not be less than:

\$1,000,000	Limit Each Accident
\$1,000,000	Limit Disease Aggregate
\$1,000,000	Limit Disease Each Employee

The CONTRACTOR shall also purchase any other coverage required by law for the benefit of employees.

The CONTRACTOR shall provide to OWNER an Affidavit stating that it meets all the requirements of Florida Statute 440.02 (15) (d).

COMMERCIAL GENERAL LIABILITY COVERAGE

CONTRACTOR shall purchase and maintain Commercial General Liability Insurance on a full occurrence form. Coverage shall include, but not be

limited to, Premises and Operations, Personal Injury, Contractual for this Agreement, Independent Contractors, Broad Form Property Damage, Products and Completed Operation Liability Coverages and shall not exclude coverage for the “X” (Explosion), “C” (Collapse) and “U” (Underground) Property Damage Liability exposures. Limits of coverage shall not be less than:

Bodily Injury, Property Damage & Personal Injury	\$1,000,000 Combined Single Limit Each Occurrence, and
Liability	\$2,000,000 Aggregate Limit

The General Aggregate Limit shall be specifically applicable to this Project. The Completed Operations Liability Coverages must be maintained for a period of not less than three (3) years following OWNER’S final acceptance of the project.

The CONTRACTOR shall add OWNER as an additional insured through the use of Insurance Service Office Endorsements No. CG 20.10.10.01 and No. CG 20.37.10.01 wording or equivalent, or broader, an executed copy of which shall be attached to or incorporated by reference on the Certificate of Insurance to be provided by CONTRACTOR pursuant to the requirements of the Contract Documents.

BUSINESS AUTOMOBILE LIABILITY COVERAGE

The CONTRACTOR shall purchase and maintain Business Automobile Liability Insurance as to ownership, maintenance, use, loading and unloading of all of CONTRACTOR’S owned, non-owned, leased, rented or hired

vehicles with limits not less than:

Bodily Injury & Property Damage	\$1,000,000 Combined Single Limit Each Accident
------------------------------------	--

EXCESS OR UMBRELLA LIABILITY COVERAGE

CONTRACTOR shall purchase and maintain Excess Umbrella Liability Insurance or Excess Liability Insurance on a full occurrence form providing the same continuous coverages as required for the underlying Commercial General, Business Automobile and Employers' Liability Coverages with no gaps in continuity of coverages or limits with OWNER added by endorsement to the policy as an additional insured in the same manner as is required under the primary policies, and shall not be less than \$10,000,000, each occurrence and aggregate as required by OWNER.

ADDITIONAL INSURANCE

The OWNER requires the following additional types of insurance.
[Either list any required insurance (e.g. Professional Liability Insurance) or indicate that none is required at this time]

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK.]

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

IN WITNESS WHEREOF, the parties hereto have executed or caused to be executed by their duly authorized officials, this Agreement in two (2) copies each of which shall be deemed an original on the date first written above.

(SEAL)

OWNER:

CITY OF PANAMA CITY BEACH,
FLORIDA

ATTEST:

BY:

City Clerk – Diane Fowler

NAME: Mario Gisbert
(Please type)

TITLE: City Manager

City Attorney (as to form only)

CONTRACTOR:

ATTEST:

BY:

NAME: _____
(Please Type)

NAME _____
(Please Type)

ADDRESS: _____

[END OF SECTION 00050]

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

SECTION 00060

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal and
(Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto:

City of Panama City Beach

(Name of Owner)

110 South Arnold Road (SR 79), Panama City Beach, Florida 32413

(Address of Owner)

hereinafter called OWNER in the total aggregate penal sum of _____
(\$_____) in lawful money of the United States, for payment of which, we bind ourselves,
our heirs, personal representatives, executors, administrators, successors, and assigns,
jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that if the Principal performs its
duties, all the undertakings, covenants, terms, and conditions of that certain Contract
between the Principal and the OWNER, dated the _____ day of _____, 2018, a copy
of which is hereto attached and made a part hereof for the construction of:

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

“PROJECT NAME(s)”

during the original term thereof, and any extensions thereof which may be granted by
the OWNER, with or without notice to the SURETY and during the guaranty period and

if the PRINCIPAL shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said SURETY, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying same shall in any way affect its obligation on this BOND, and does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that it is expressly agreed that the BOND shall be amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the Contract Price more than twenty percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, or the CONTRACT DOCUMENTS, shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the rights of OWNER hereunder. The OWNER is the only beneficiary hereunder.

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK.]

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

IN WITNESS WHEREOF, this instrument is executed in three (3) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 2018.

Principal

(Principal) Secretary

(SEAL)

BY _____

(Address)

Witness as to Principal

(Address)

(Surety)

ATTEST:

Witness to Surety

BY _____
Attorney-In-Fact

(Address)

(Address)

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

NOTE: Date of BOND must not be prior to date of Contract.

Contractor's Surety shall use this form along with their personal documentation.

If CONTRACTOR is partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

[END OF SECTION 00060]

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

SECTION 00070

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal and
(Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto:

City of Panama City Beach

(Name of Owner)

110 South Arnold Road (SR 79), Panama City Beach, Florida 32413

(Address of Owner)

hereinafter called OWNER, and unto all persons, firms and corporations who or which may furnish labor, or who furnish materials to perform as described under the Contract and to their successors and assigns in the total aggregate penal sum of Five Hundred Twenty Seven Thousand and Sixty Nine Dollars and Zero Cents (\$ 527,069.00) in lawful money of the United States, for the payment of which, we bind ourselves, our heirs, personal representatives, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that if the PRINCIPAL properly makes payment to all claimants, as defined in Section 255.05(1), Florida Statutes, supplying Principal with labor, materials or supplies, used directly or indirectly by the Principal in the prosecution of the WORK provided for under that certain contract between the Principal and the OWNER, dated the ____ day of July, 2016, a copy of which is hereto attached and made a part hereof for the construction of:

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

“PROJECT NAME(S)”

and any authorized extensions or modification thereof, including all amounts due for materials, lubricants, fuel, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and for all labor cost incurred in such WORK including that by a SUBCONTRACTOR or SUPPLIER of any tier, and to any construction lien holder whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to WORK to be performed thereunder or SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, every suit instituted upon the BOND shall be brought in a court of competent jurisdiction for the county or circuit in which the Contract was to be performed. Owner shall not be joined as a party in any such suit. The notice and time limits of Section 255.05, Florida Statutes, are incorporated herein.

PROVIDED, FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the Contract Price more than twenty percent so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this BOND and whether referring to this BOND, or the CONTRACT DOCUMENTS shall include any change, alteration, addition, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the rights of the OWNER hereunder.

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK.]

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

WITNESS WHEREOF, this instrument is executed in **three (3)** counterparts, each one of which shall be deemed an original, this the _____ day of _____, 2018.

Principal

(Principal) Secretary

(SEAL) BY _____

(Address)

Witness as to Principal

(Address)

(Surety)

ATTEST:

Witness as to Surety

BY _____
Attorney-In-Fact

(Address)

(Address)

NOTE: Date of BOND must not be prior to date of Contract.

If CONTRACTOR is partnership, all partners should execute BOND. Contractor's Surety shall use this form along with their personal documentation.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the Project is located.

[END OF SECTION 00070]

SECTION 00080

NOTICE OF AWARD

TO:

PROJECT DESCRIPTION:

LIFT STATION #21 IMPROVEMENTS

The City of Panama City Beach (“City”) has considered the BID submitted by you for the above described Project in response to its Advertisement for Bids dated _____, 2018, and associated Information for Bidders.

You are hereby notified that your Bid in the amount of \$_____ has been accepted by the City. Provided, however, nothing in this Notice or your delivery to the City of the Agreement executed by you (with the required Bonds and Certificates of Insurance) shall in any manner or way be deemed to create any contract between you and the City. No such contract shall be created unless and until the City signs the Agreement.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance Bond, Payment Bond, and Certificates of Insurance within ten (10) calendar days from the date of this Notice.

If you fail to execute said Agreement, together with the required Certificates of Insurance and Bonds, within ten (10) calendar days from the date of this Notice, City will be entitled to consider all your rights arising out of City’s acceptance of your BID as abandoned and as a forfeiture of your Bid Deposit. The City will be entitled to all other rights and remedies as may be available to it at law.

You must return an acknowledged copy of this Notice of Award to the City, with the executed Agreement and required Certificates of Insurance and Bonds, within the above noted ten (10) calendar day period.

Dated this ____ day of _____, 2018..

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK.]

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

CITY OF PANAMA CITY BEACH
Owner

By _____

Name: Mario Gisbert

Title: City Manager

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged

By _____

This the _____ day of _____, 20____.

Name _____

Title _____

[END OF SECTION 00080]

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

SECTION 00090

NOTICE TO PROCEED

TO: _____

PROJECT DESCRIPTION:

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 2018 on or before _____, 2018, and you are to substantially complete the WORK within the following schedule in consecutive calendar days thereafter:

<u>Completion Milestone</u>	<u>Calendar Days Following Notice to Proceed</u>
Construct all improvements for proposed Lift Station 21	120

The date of Substantial Completion is therefore _____.
You are to achieve Final Completion days of achieving Substantial Completion. You must return and acknowledge a copy of this Notice to Proceed to the City within five (5) calendar days of your receipt of this Notice.

CITY OF PANAMA CITY BEACH

By: _____

Name: Mario Gisbert

Title: City Manager

ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged

By _____
(Company Name)

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

This the _____ day of _____, 2018.

(Signature)

(Type or Print Name)

(Title)

[END OF SECTION 00090]

SECTION 00095

STATEMENT UNDER SECTION 287.087
FLORIDA STATUTES, ON PREFERENCE TO BUSINESSES WITH
DRUG-FREE WORKPLACE PROGRAMS

IDENTICAL TIE BIDS: Preference shall be given to businesses with drug-free workplace programs. Whenever two or more BIDS which are equal with respect to price, quality and service are received by the OWNER for this PROJECT, a bid received from a BIDDER that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business' 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. Give each employee engaged in providing the commodities or contractual services that are under BID a copy of the statement specified in paragraph (1).
4. In the statement specified in paragraph (1), notify the employees that, as a condition of working on the commodities or contractual services that are under BID, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo 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 not later than five (5) days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program is such is available in the employee's community, by an employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this Section.

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

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

BIDDER SIGNATURE

[END OF SECTION 00095]

SECTION 00096

CERTIFICATE OF COMPLIANCE WITH THE
FLORIDA TRENCH SAFETY ACT

Bidder acknowledges sole responsibility for complying with the Florida Trench Safety Act (Act). Section 553.60, Florida Statutes. Bidder further acknowledges that included in the various items of its BID and in its Total Lump Sum Bid are costs for complying with the Florida Trench Safety Act. The Bidder further identifies the costs to be summarized below:

Trench Safety Method (Description)	Units of Measure (LF, SY)	Quantity	Unit Cost	Extended Cost	Unit Extended
A. _____	_____	_____	_____	_____	_____
B. _____	_____	_____	_____	_____	_____
C. _____	_____	_____	_____	_____	_____
D. _____	_____	_____	_____	_____	_____
				Total	\$_____

Failure to complete the above may result in your BID being declared non-responsive. The costs indicated above are provided to comply with the Act and shall not constitute grounds for any additional compensation to that listed for the separate line items of the Bid Form.

Bidder _____
By: _____
Its _____

Date _____

Authorized Signature

[END OF SECTION 00096]

SECTION 00097

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

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY
PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS AND
SUBMITTED WITH THE BID

1. This sworn statement is submitted to _____
by _____
For _____
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 Section 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 with the United States, including, but not limited to, any bid, proposal, reply, or contract for goods or services, any lease for real property, or any contract for the construction or repair of a public building or public work, involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

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

3. I understand that "affiliate" as defined in Section 2871.33 (1)(a) , Florida Statutes, means:
- (a.) A predecessor or successor of a person convicted of a public entity crime, or
 - (b.) 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,

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

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.

4. I understand that a "person" as defined in Section 287.133 (1)(e), Florida Statute, means any natural person or any 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 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.

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

_____Neither the person submitting this sworn statement nor any affiliate of the person has been charged with and convicted of a public entity crime causing such person or affiliate to be placed on the convicted vendor list within the last thirty-six (36) months.

_____The person submitting this sworn statement or an affiliate of the person has been charged with and convicted of a public entity crime causing such person or affiliate to be placed on the convicted vendor list within the last thirty-six (36) months.

_____The person submitting this sworn statement or an affiliate of the person has been charged with and convicted of a public entity crime causing such person or affiliate to be placed on the convicted vendor list within the last thirty-six (36) months. However, it has been determined, pursuant to Section 287.133, Florida Statutes, that it was not in the public interest to place the person submitting this sworn statement or its affiliate on the convicted vendor list. [Attach a copy of the final order].

6. I understand by my execution of this document, I acknowledge that the person submitting this sworn statement has been informed by the City of Panama City Beach, of the terms of Section 287.133(2)(a) of the Florida Statutes which read as follows:

"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, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; 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 for CATEGORY TWO for a period of 36 months following the date of being placed on the convicted vendor list."

7. I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THE PUBLIC ENTITY ONLY AND THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY IMMEDIATELY OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK.]

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

By: _____

Print name: _____

Its: _____

Sworn to and subscribed before me this _____ day of _____, 20____.

Personally known _____ OR Produced identification _____

Notary Public- State of _____

My commission expires _____

[printed, typed or stamped
Commissioned Name of Notary Public]

[END OF SECTION 00097]

SECTION 00099
CERTIFICATE OF INSURANCE

(Attached)

Certificate of Insurance

In consideration of the premiums charged for the insurance policies shown in this certificate, this certificate of insurance is issued to the certificate holder shown below. This certificate does not amend, extend or alter the coverage afforded by the policies listed below except as shown below.

NAME AND ADDRESS OF AGENCY	COMPANIES AFFORDING COVERAGES
	COMPANY LETTER A
NAME AND ADDRESS OF INSURED	COMPANY LETTER B
	COMPANY LETTER C
	COMPANY LETTER D
	COMPANY LETTER E

This is to certify that the insurance policies listed below have been issued to the insured and are in force at this time. It is agreed that none of these policies will be cancelled, non-renewed or reduced in coverage (except in the application of the aggregate liability limits provision) until after 30 days written notice of such action has been delivered to the certificate holder at its address shown below. The policies shown in this certificate are primary to any insurance carried by the certificate holder or any self insurance thereof, with respect to the activities of the insured named above.

COMPANY LETTER	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	ALL LIMITS IN THOUSANDS	
					EACH OCCURRENCE	AGGREGATE
	GENERAL LIABILITY <input type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> OCCURRENCE <input type="checkbox"/> OWNER'S & CONTRACTORS PROTECTIVE <input type="checkbox"/> X.C.U. COVERAGES <input type="checkbox"/> _____ <input type="checkbox"/> _____				GENERAL AGGREGATE \$ _____ PRODUCT COMP. OPS AGGREGATE \$ _____ PERSONAL & ADVERTISING INJURY \$ _____ EACH OCCURRENCE \$ _____ FIRE DAMAGE (ANY ONE FIRE) \$ _____ MEDICAL EXPENSE (ANY ONE PERSON) \$ _____ SPECIFIC AGGREGATES *(SEE BELOW) \$ AS ABOVE	
	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS <input type="checkbox"/> GARAGE LIABILITY <input type="checkbox"/> _____				BODILY INJURY (EACH PERSON) \$ _____ BODILY INJURY (EACH ACCIDENT) \$ _____ PROPERTY DAMAGE \$ _____ BODILY INJURY AND PROPERTY DAMAGE COMBINED \$ _____	
	EXCESS LIABILITY <input type="checkbox"/> UMBRELLA FORM <input type="checkbox"/> OTHER THAN UMBRELLA FORM <input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> OCCURRENCE				BODILY INJURY AND PROPERTY DAMAGE COMBINED \$ _____	
	WORKER'S COMPENSATION and EMPLOYER'S LIABILITY				STATUTORY (EACH ACCIDENT) \$ _____ (DISEASE POLICY LIMIT) \$ _____ (DISEASE EACH EMPLOYEE) \$ _____	
	OTHER					

The City of Panama City Beach is included as an additional insured as respects the General, Automobile, and Excess Liability Policies described herein.

DESCRIPTION OF OPERATIONS/VEHICLE/SPECIAL ITEMS:

*SPECIFIC AGGREGATE LIABILITY LIMITS APPLY TO:

NAME AND ADDRESS OF CERTIFICATE HOLDER <p style="text-align: center;">CITY OF PANAMA CITY BEACH Address: 110 S. Arnold Road Panama City Beach, FL 32413</p> PHONE: (850) 233-5100 FAX: (850) 233-5108	Date issued:
	Authorized Representative: <div style="text-align: center;">(Original Signature Required)</div>
	<div style="text-align: center;">(Print/Type Name)</div>
	Address:
	Telephone # FAX #

City of Panama City Beach, Florida

INSTRUCTIONS TO AGENTS ON COMPLETING THE CITY CERTIFICATE OF INSURANCE

The Florida Department of Insurance has approved the general form and substance of the City's Certificate of Insurance form for use in the State of Florida. For further information, please contact the City's Public Works Department.

In order to prevent unnecessary follow-up work on the Certificate or delay in the start of your insured's activity under its contract with the City, please follow these instructions:

1. Complete the City's Certificate of Insurance as required in your insured's contract with the City.
2. Show the full name of your insured as shown in its contract with the City.
3. Show the full names of the insurance companies providing coverages.
4. Under the General Liability section, show the coverages applicable by checking the appropriate boxes.
5. If required in your insured's contract with the City, the Specific General Aggregate Limit for the Certificate holder's project or location must be included in the Commercial General Liability Policy and must be shown with a description of the project or location on the line beginning near the bottom of the Certificate titled "Specific Aggregate Liability."
6. Automobile Liability Coverage should be shown as applicable to "any auto" and "hired and non-owned autos" by checking the appropriate boxes.
7. Indicate whether Excess Liability is written on a "claims made" or "occurrence" form. If employers' Liability Coverage is not included, please indicate.
8. Included a brief description of the contract involving your insured in the space provided under the Description of Operations.
9. The liability policies must include the City as an additional insured.
10. Complete the signature section, showing the mailing address, telephone number, and FAX number of the Authorized Representative. Please also type the Authorized Representative's name under the signature. Facsimile signature is not acceptable; a manual signature of the Authorized Representative is required.
11. If time is of the essence in submitting this document, you may send a facsimile transmittal; however, you must provide a cover sheet for the document stating the Agent's signature was manually produced and not a "stamped" signature and you must follow-up by mailing the original document back to the Department indicated in the lower left corner of the Certificate.

SECTION 00100

GENERAL CONDITIONS

- | | | | |
|-----|---|-----|---|
| 1. | Definitions | 25. | Engineer's Authority |
| 2. | Additional Instructions
and Detail Drawings | 26. | Land and Right-of-Ways |
| 3. | Schedules, Reports and
Records | 27. | Guarantee |
| 4. | Intent of the Contract
Documents, Drawings and
Specifications | 28. | Claims and Disputes |
| 5. | Shop Drawings | 29. | Taxes |
| 6. | Materials, Services, and
Facilities | 30. | Contract Time, Schedule of the Work,
and Time Extensions |
| 7. | Inspection and Testing | 31. | Use of Site |
| 8. | Substitutions | 32. | Temporary Facilities |
| 9. | Patents | 33. | Clean Up and Disposal of Waste
Materials |
| 10. | Surveys, Permits,
Regulations, and Project
Layout | 34. | Warranty of Title |
| 11. | Protection of Work,
Property, Persons | 35. | Ownership of Hidden Valuable Materials |
| 12. | Supervision by Contractor | 36. | As-Built Plans and Documents to be
kept at the Site |
| 13. | Changes in the Work | 37. | Silence of Specifications |
| 14. | Changes in Contract Price | 38. | Gratuities |
| 15. | Time for Completion and
Liquidated Damages | 39. | Audit and Access to Records |
| 16. | Correction of Defective Work | 40. | Equal Opportunity Requirements |
| 17. | Suspension of Work,
Termination, and Delay | 41. | Changed Conditions |
| 18. | Payments to Contractor | 42. | Compliance with Laws |
| 19. | Acceptance of Final
Payment as Release | 43. | Public Entity Crimes |
| 20. | Contract Security | 44. | Insurance Requirements |
| 21. | Assignments | | |
| 22. | Indemnification | | |
| 23. | Separate Contracts | | |
| 24. | Subcontracting | | |

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

1.0 DEFINITIONS

- 1.1 Unless otherwise expressly noted, wherever used in the Contract Documents the following terms shall have the meanings indicated and shall be applicable to both the singular and plural thereof:
- 1.2 ADDENDA - Written or graphic instruments, issued by Owner or Engineer prior to the execution of the Agreement, which modify or interpret any of the Contract Documents by additions, deletions, clarifications, or corrections.
- 1.3 BID - The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
- 1.4 BIDDER - Any person, firm, or corporation submitting a Bid for the Work.
- 1.5 BONDS - Bid, Performance, and Payment Bonds and other instruments or surety, furnished by the Contractor and the Contractor's surety in accordance with the Contract Documents.
- 1.6 CHANGE ORDER - A written order to the Contractor issued in accordance with the procedures set forth in the Contract Documents, authorizing an addition, deletion, or revision in the Work within the general scope of the Contract Documents, or authorizing an adjustment in the Contract Price or Contract Time.
- 1.7 CONSTRUCTION CHANGE DIRECTIVE – A Construction Change Directive is a written order prepared by the Engineer and signed by the Owner, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Price or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Agreement, order changes in the Work within the general scope of the Agreement consisting of additions, deletions or other revisions, the Contract Price and Contract Time being adjusted accordingly.
- 1.8 CONTRACT DOCUMENTS – Collectively the Agreement, Proposal Form, Payment Bond, Performance Bond, General Conditions, Supplemental Conditions, if any, Notice of Award, Notice to Proceed, Drug Free Workplace Program Statement, Trench Safety Act Certificate of Compliance, Public Entity Crimes Statement, Sales Tax Exemption Addendum, Certificate of Insurance, Release and Affidavit from Contractor, Release and Affidavit from Subcontractor, Application and Certificate for Payment, Certificate of Substantial Completion, Contract Change Order(s), Construction Change Directives, Field Orders, Drawings, Specifications and Addenda. The Contract Documents are sometimes referred to herein as the Agreement.
- 1.9 CONTRACT PRICE - The total compensation payable by Owner to Contractor

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

under the terms and conditions of the Contract Documents.

- 1.10 CONTRACT TIME - The total period of time beginning with the date of commencement of the Work as authorized by the City and ending on the required date for Substantial Completion of the Work. The Contract Time is set forth with more specificity in Section 2 of the Agreement.
- 1.11 CONTRACTOR - The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative.
- 1.12 CITY or OWNER – The City of Panama City Beach, Florida, acting through its City Council and Charter Officers.
- 1.13 DRAWINGS - The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.
- 1.14 ENGINEER - The person, firm or corporation named as such in the Agreement.
- 1.15 FIELD ORDER - A written order effecting a clarification or change in the Work not involving an adjustment in the Contract Price or an extension of the Contract Time, issued by Engineer or Owner to Contractor during construction.
- 1.16 NOTICE OF AWARD - The written notice of the acceptance of the Bid from the City to the successful Bidder.
- 1.17 NOTICE TO PROCEED - Written communication issued by the City to the Contractor authorizing it to proceed with the Work and establishing the date for commencement of the Work.
- 1.18 OWNER - Same as CITY; same as City of Panama City Beach, Florida.
- 1.19 PROJECT – The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the City or by separate contractors, and is formally known as the Colony Club Lift Stations 8 and 18 Replacement project.
- 1.20 PROJECT ADMINISTRATION MANUAL (sometimes referred to herein as the "MANUAL") – The City's manual of forms and standard administrative procedures regarding project administration. Contractor acknowledges and agrees it has received a copy of the current Manual and shall incorporate any modifications or updates issued by the City into its copy of the Manual to

ensure the Manual is kept up to date.

- 1.21 PROJECT REPRESENTATIVE -The Project Representative shall be the City's representative with respect to the Project and may be a City employee or an outside consultant. The Project Representative shall have authority to transmit instructions, receive information, and interpret and define the City's policies and decisions with respect to the Work. However, except as may be otherwise expressly authorized in writing by the City, the Project Representative is not authorized on behalf of the City to issue any verbal or written orders or instructions to Contractor that would have the affect, or be interpreted to have the affect, of amending or modifying the terms or conditions of the Contract Documents or modifying or amending in any way whatever the: (1) scope or quality of Work to be performed and provided by Contractor as set forth in the Contract Document; (2) the time within which Contractor is obligated to complete the Work; or (3) the amount of compensation the City is obligated or committed to pay Contractor as set forth in the Contract Documents.
- 1.22 SHOP DRAWINGS - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.
- 1.23 SPECIFICATIONS - The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.
- 1.24 SUBCONTRACTOR - An individual, firm, or corporation having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the site.
- 1.25 SUBSTANTIAL COMPLETION - That date certified by the Engineer when the Work or an Owner specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the Work or the Owner specified part thereof can be utilized by Owner for the purposes for which it is intended.
- 1.26 SUPPLEMENTAL CONDITIONS - Modifications to the General Conditions required by Owner, set forth in the Section 00800 series of documents.
- 1.27 SUPPLIER - Any person or organization who supplies materials or equipment for the Work for or on behalf of Contractor, including those fabricated to a special design, but who does not perform labor at the site.
- 1.28 WORK - The term "Work" means the construction and services required by the

Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

2.0 ADDITIONAL INSTRUCTION AND DETAIL DRAWINGS

2.1 From time to time, Contractor may be furnished additional instructions and detail drawings by the Engineer as necessary to permit Contractor to carry out the Work required by the Contract Documents.

2.2 Any such additional drawings and instructions supplied to Contractor shall be issued as a Field Order. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions.

3.0 SCHEDULES, REPORTS AND RECORDS

3.1 The Contractor shall submit to the City such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the Contract Documents for the Work to be performed.

3.2 Contractor shall prepare and provide its construction progress schedule ("Construction Schedule") prior to submitting its first Application for Payment, showing the order in which the Contractor proposes to carry on the Work, including dates at which the various parts of the Work will be started, estimated date of completion of each part and, as applicable, the dates at which special drawings will be required and dates for submission of Shop Drawings, the beginning of manufacture, the testing and the installation of materials, supplies and equipment. Further, the Construction Schedule shall not only include the overall progress schedule for the Work to be provided by Contractor hereunder, but also shall include reasonable time periods for Engineer's performance, as accepted by Engineer. The Construction Schedule and any other schedules required by the City hereunder shall be updated monthly. The Construction Schedule and all updates to it shall not exceed the time periods established in the Contract Documents and shall be subject to the City's and Engineer's review and comment. Contractor's submittal of a satisfactory Construction Schedule and updates thereto and the City's acceptance of same shall be a condition precedent to the City's obligation to pay Contractor; provided, however, the acceptance of any such schedule or update by Owner shall not be deemed an admission by Owner that such schedule or update is reasonable, accurate or correct.

3.3 The Contractor shall also submit a schedule of payments, for Owner's review and approval that the Contractor anticipates will be earned during the course of

the Work.

4.0 INTENT OF THE CONTRACT DOCUMENTS, DRAWINGS AND SPECIFICATIONS

4.1 It is the intent of the Contract Documents to describe a functionally complete Project (or portion thereof) to be constructed in accordance with the Contract Documents. Any work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not specifically called for in the Contract Documents. If the Contract Documents include words or terms that have a generally accepted technical or industry meaning, then such words or terms shall be interpreted to have such standard meaning unless otherwise expressly noted in the Contract Documents. Reference to standard specifications, manuals or codes of any technical society, organization or association or to the laws or regulations of any governmental authority having jurisdiction over the Project, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, law or regulation in affect at the time the Work is performed, except as may be otherwise specifically stated herein. Provided, however, in the event the standard specification, manual, code, law or regulation is changed after the Agreement has been executed by the parties, a Change Order shall be issued equitably adjusting the Contract Price and/or Contract Time to the extent such change materially impacts the Contract Time and/or Contract Price.

4.2 Contractor shall perform the Work consistent with the intent of the Drawings, Specifications, and other Contract Documents, and Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the Work in accordance with the Contract Documents and all incidental items necessary to complete the Work in an acceptable manner, ready for use, occupancy or operation by the City.

4.3 Drawings are intended to show general arrangements, design and extent of Work and are not intended to serve as shop drawings. Specifications are separated into divisions for convenience of reference only and shall not be interpreted as establishing divisions for the Work, trades, subcontracts or extent of any part of the Work. In the event of a discrepancy between or among the Drawings, Specifications or other Contract Document provisions, Contractor shall be required to comply with the provision which is the more restrictive or stringent requirement upon Contractor, as determined by the City.

4.4 If during the performance of the Work Contractor discovers a conflict, error or discrepancy in the Contract Documents, including the Drawings and Specifications, Contractor immediately shall report same to Engineer and Owner in writing, and before proceeding with the Work affected thereby, shall

obtain a written interpretation or clarification from Engineer. Work done by the Contractor after discovery of such conflict, error, or discrepancy without such written interpretation or clarification from Engineer, shall be done at the Contractor's risk. Prior to commencing the Work, Contractor shall first take all necessary field measurements and verify the applicable field conditions. After taking such measurements and verifying such conditions, Contractor shall carefully compare such measurements and conditions with the requirements of the Contract Documents, taking into consideration all other relevant information known to Contractor, for the purpose of identifying and bringing to Engineer's and City's attention all conflicts or discrepancies with the Contract Documents. Contractor is solely responsible for verifying all field measurements and conditions.

4.5 Contractor shall comply with the City's standard forms and procedures as set forth in the City's Project Administration Manual relating to Project administration. To the extent there is no form or procedure for a particular matter, then Contractor shall comply with the form or procedure reasonably required by the City. Once a standard form has been executed by Contractor and Owner as necessary, the executed copy shall become part of the Contract Documents.

5.0 SHOP DRAWINGS

5.1 The Contractor shall provide shop drawings as may be necessary for the prosecution of the Work as required by the Contract Documents. The Engineer shall promptly review all shop drawings. The Engineer's approval of any shop drawing shall not release the Contractor from responsibility for deviations from the Contract Documents. Any shop drawing which deviates from the requirements of the Contract Documents must be first authorized by a Change Order.

5.2 When submitted for the Engineer's review, shop drawings shall bear the Contractor's certification that it has reviewed, checked and approved the shop drawings and that they are in conformance with the requirements of the Contract Documents.

5.3 Portions of the Work requiring a shop drawing or sample submission shall not begin until the shop drawing or submission has been approved by the Engineer. A copy of each approved shop drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

6.0 MATERIALS, SERVICES AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the Contract

Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete and deliver the Work within the Contract Time.

- 6.2 Materials and equipment shall be stored by Contractor to ensure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work shall be located so as to facilitate prompt inspection.
- 6.3 Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used cleaned and conditioned as directed by the manufacturer.
- 6.4 Materials, supplies, and equipment shall be in accordance with samples submitted by the Contractor and approved by the Engineer.
- 6.5 Materials, supplies and equipment to be incorporated into the Work shall not be purchased by the Contractor or the Subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest or lien is retained by the seller.

7.0 INSPECTION AND TESTING

- 7.1 All materials and equipment used in the construction of the Project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents or required by applicable governmental law, rule or regulation.
- 7.2 The City, Engineer, their respective representatives, agents and employees and governmental agencies with jurisdiction over the Project shall have access at all times to the Work whether the Work is being performed on or off of the Project site, for their observation, inspection and testing. Contractor shall provide proper and safe conditions for such access, and also for any inspection or testing thereof. Contractor shall provide the City and Engineer with timely prior written notice (at least 48 hours) of the readiness of the Work for all required inspections, tests or approvals. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all Work, materials, payrolls, personnel records, material invoices, and other relevant data and records.
- 7.3 The Contractor shall provide at the Contractor's expense all testing and inspection services required by the Contract Documents or any applicable governmental law, rule or regulation. Re-inspection and re-testing fees and

costs of all testing failures shall be at the Contractor's expense.

- 7.4 If the Contract Documents or any applicable governmental law, rule, or regulation requires any portion of the Work to specifically be inspected, tested, or approved, Contractor shall assume full responsibility therefore, pay all costs in connection therewith and furnish the Engineer the required certificates of inspection, testing or approval. All inspections, tests or approvals shall be performed in a manner and by organizations acceptable to the City and Engineer.
- 7.5 Neither observations by Engineer or the City, nor inspections, tests or approvals by the Engineer or others shall relieve the Contractor from the obligations to perform the Work in accordance with the requirements of the Contract Documents.
- 7.6 If any Work is covered contrary to the written instruction of the Engineer, it must, if requested by the Engineer, be uncovered for the Engineer's observation and replaced at the Contractor's expense.
- 7.7 If any Work that is to be inspected, tested or approved pursuant to the Contract Documents or any applicable governmental law, rule or regulation is covered without such inspection, testing or approval having been satisfactorily obtained by Contractor and without obtaining the written concurrence from Engineer, Contractor shall uncover, expose or otherwise make available the Work for such observation, inspection or testing as directed by Engineer, and Contractor shall be responsible for all such costs of uncovering, exposing, observation, inspection, testing, and reconstruction.
- 7.8 If the Engineer considers it necessary or advisable that covered Work be inspected or tested by others that was not otherwise required to be tested or inspected by the terms of the Contract Documents or any applicable governmental law, rule or regulation, the Contractor, at the Engineer's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the Work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such Work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such Work is not found to be defective, the Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate Change Order shall be issued.
- 8.0 SUBSTITUTIONS

8.1 Whenever a material, article, or piece of equipment is identified on the Drawings or Specifications by reference to brand name or catalogue numbers, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function may be considered. The Contractor may recommend the substitution of a material, article, or piece of equipment of equal substance, quality, and function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Engineer, such material, article, or piece of equipment is of equal substance, quality and function to that specified, the Engineer may allow its substitution and use by the Contractor. If the Contractor based its bid on "or equal" products and the City and/or Engineer determine that one or more of the Contractor's proposed "or equal" products included in its bid fails to meet the requirements of the Contract Documents, Contractor may be required, at City's sole discretion, to provide products conforming with the requirements of the Contract Documents at no additional cost to the City per the City's direction.

8.2 If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall certify that the proposed substitute shall perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. Contractor shall also certify that the evaluation and acceptance of the proposed substitute will not prejudice Contractor's achievement of Substantial Completion of the Work within the Contract Time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for the Project) to adapt the design to the proposed substitute and whether or not incorporation or use by the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service shall be indicated. Contractor shall also provide an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs for redesign and claims of other contractors affected by the resulting change, all of which shall be considered by Engineer in evaluating the proposed substitute. Engineer or Owner may require Contractor to furnish at Contractor's expense additional data about the proposed substitute. Further, Contractor shall reimburse Owner for the changes of Engineer and Engineer's consultants for evaluating each proposed substitute submitted after the effective date of the Agreement and all costs resulting from any delays in the Work while the substitute was undergoing review.

9.0 PATENTS

9.1 The Contractor shall pay all applicable royalties and license fees, and shall

defend all suits or claims for infringement of any patent rights and save the City harmless from loss on account thereof, except that the City shall be responsible for any such loss when a particular process, design, or product of a particular manufacturer or manufacturers is specified. Provided, however, if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, the Contractor shall be responsible for such loss or claim unless the Contractor promptly gives such information in writing to the Engineer and City.

10.0 SURVEYS, PERMITS, REGULATIONS, AND PROJECT LAYOUT

10.1 The City shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the Work together with a suitable number of bench marks adjacent to the Work as shown in the Contract Documents. From the information provided by the City, unless otherwise specified in the Contract Documents, the Contractor shall develop and make all detail surveys needed for construction such as slope stakes, batten boards, stakes for pipe locations and other working points, lines, elevations and cut sheets.

10.2 The Contractor shall carefully preserve benchmarks, reference points and stakes. Contractor is solely responsible for maintaining all benchmarks, reference points, and stakes, and is solely responsible for any mistake that may be caused by their loss or disturbance. The Contractor shall be held responsible for all mistakes that may be caused by the loss or disturbance of any such benchmarks, reference points or stakes.

10.3 The Contractor shall engage for the performance of Project layout and control, a Professional Land Surveyor registered in the State of Florida to practice land surveying. Said surveyor must carry Professional Liability Insurance in the amount of at least one million dollars (\$1,000,000) per occurrence. The land surveyor employed for this Project must comply with the Minimum Technical Standards for Surveying and Mapping pursuant to Florida Statute 472.027.

10.4 Should the Contractor in the course of its Work find that the points, grades and levels which are shown upon the Drawings are not conformable to the physical conditions of the locality at the proposed work or structure, it shall immediately inform the Engineer of the discrepancy between actual physical conditions of the locality of the proposed work, and the points, grades and levels which are shown on the drawings. No claim shall be made by the Contractor against the City for compensation or damage by reasons of failure of the Engineer to represent upon the Drawings points, grades and levels conformable to the actual physical conditions of the locality of the proposed work.

10.5 All permits and licenses necessary for the prosecution of the Work shall be

secured and paid for by the Contractor unless otherwise expressly noted in the Contract Documents. These shall include all building permits, burn permits, debris disposal permits, etc. All licenses, easements and variances for permanent structures or permanent changes in existing facilities shall be secured and paid for by the City, unless otherwise specified in the Contract Documents. The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and governmental permits and approvals bearing on the conduct of the Work as drawn and specified. If the Contractor observes that the Contract Documents are at variance therewith, the Contractor shall promptly notify the Engineer and City in writing, and any necessary changes shall be adjusted as provided in Section 13 below.

11.0 PROTECTION OF WORK, PROPERTY, AND PERSONS

11.1 The Contractor is responsible for the safety and protection of all persons and property on or about the Project site during the progress of the Work, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

Further, it is Contractor's responsibility to protect from damage or loss all material and equipment to be incorporated into the Work whether in storage on or off the Project site. Contractor shall initiate, maintain and supervise all safety precautions and programs in connection with the Work and shall develop and implement, in accordance with the requirements of the Contract Documents, a safety plan for the Work. Contractor's safety plan shall include a hurricane protection plan. Contractor's duties and responsibilities for the safety and protection of the Work shall continue until such time as the Work is completed and final acceptance of same by the City has occurred.

11.2 The Contractor will comply with all applicable codes, laws, ordinances, rules, regulations and orders of the City and any public body having jurisdiction over the Work, including the Occupational Safety and Health Administration (OSHA) and any State Safety and Health agency requirements and all of their safety codes, laws, ordinances, rules and regulations. The Contractor will erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. Contractor shall notify owners of adjacent property and of any underground structures or improvements and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation or replacement of their property. The Contractor will remedy all damage, injury or loss to any property caused by the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone of whose acts any of them be liable.

11.3 Barricades, Guards and Safety Provisions: To protect persons from injury and to avoid property damage, adequate barricades, construction signs, torches,

red lanterns and guards shall be placed and maintained during progress of construction work and until it is safe for both pedestrians and vehicular traffic. Rules and regulations of local authorities regarding safety provisions shall be observed.

- 11.4 In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instructions or authorization from the Engineer or City, shall act to prevent threatened damage, injury or loss. The Contractor will give the Engineer prompt written notice of any such emergency and to the extent the emergency was not caused by the fault or neglect of Contractor or anyone for whom Contractor is responsible, a Change Order shall be issued covering the necessary and reasonable changes and deviations involved.
- 11.5 At all times during the performance of the Work at the Project site, Contractor shall have designated, and located on a full time basis at the Project site, a qualified individual whose responsibility shall be to monitor and enforce Contractor's safety program at the Project site; such individual shall be deemed to be the Contractor's Project Superintendent. However, Contractor may designate by written notice to the City another individual, reasonably acceptable to the City, who shall be Contractor's safety representative at the Project site.
- 11.6 Alcohol, drugs and all illegal substances are strictly prohibited on the Project site and any City property. All employees of Contractor, as well as those of all Subcontractors and those of any other person or entity for whom Contractor is legally liable (collectively referred to herein as "Employees"), shall not possess or be under the influence of any such substances while on the Project site or any City property. Further, employees shall not bring on to the Project site or any City property any gun, rifle or other firearm, or explosives of any kind. Provided, however, to the extent explosives are reasonably required with respect to the performance of the Work, Contractor shall strictly comply with the Contract Documents and any and all rules and regulations of Owner or of any applicable governmental agency as it relates to the storage, handling and use of such explosives.
- 12.0 SUPERVISION BY CONTRACTOR
- 12.1 The Contractor will supervise and direct the Work. Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor will employ and maintain on the Project site on a full time basis a qualified superintendent acceptable to the City. The superintendent and his or her designees shall have full authority to act on behalf of the Contractor and all communications given to the superintendent or his or her designee shall be as binding as if given to the Contractor. The

superintendent or his or her designee shall be present on the site at all times when any portion of the Work is being performed to ensure adequate supervision and coordination of the Work.

13.0 CHANGES IN THE WORK

13.1 The City may at any time during the progress of the Work, as the need arises and in its sole discretion, order changes within the general scope of the Work without invalidating the Agreement. Promptly after being notified of a change, but in no event more than fourteen (14) days after its receipt of such notification (unless the City has agreed in writing to a longer period of time), Contractor shall submit an itemized estimate of any cost or time increases or savings it foresees as a result of the change. Except in an emergency endangering life or property, no addition or changes to the Work shall be made except upon a properly issued Change Order, Construction Change Directive or Field Order. No officer, employee or agent of the City is authorized to direct any extra or changed work without a properly issued Change Order, Construction Change Directive, or Field Order.

13.2 All changes to the Work must be authorized by means of a written Change Order that is mutually agreed to by the City and Contractor or a Construction Change Directive issued by the City or a Field Order issued by the City or Engineer. If the change is to be accomplished through a Change Order, the Change Order, in the form set forth in the City's Project Administration Manual, shall be prepared by Contractor, reviewed by Engineer and the City, and executed promptly by the parties after an agreement is reached between Contractor and the City concerning the requested changes. Contractor shall promptly perform changes authorized by duly executed Change Orders. The Contract Price and Contract Time shall be adjusted in the Change Order in the manner as the City and Contractor shall mutually agree. The Change Order shall identify the changed work. Also, where the Contract Price is based upon unit prices, a Change Order may be used for work for which quantities have been altered from those shown in the bidding schedule, as well as decreases or increases in the quantities of installed units which are different than those shown in the bidding schedule because of final measurements. All changes must be recorded on an executed Change Order before they can be included in a monthly Application for Payment.

13.3 To the extent the Contract Price is based on unit prices, the City reserves the right to increase or decrease a unit price quantity as may be deemed reasonable or necessary in order to complete the Work contemplated by this Agreement.

13.4 If the City and Contractor are unable to agree on a Change Order for the requested change, Contractor shall, nevertheless, promptly perform the

change as directed by the City in a written Construction Change Directive. In that event, the Contract Price and Contract Time shall be adjusted in the Construction Change Directive as determined by the City. If Contractor disagrees with the City's adjustment determination, Contractor must make a claim strictly in accordance with the terms of the Contract Documents or else be deemed to have waived any claim it might otherwise have had on that matter.

13.5 The City shall have the right to conduct an audit of Contractor's books and records, as well as those of its Subcontractors and Suppliers, to verify the accuracy of Contractor's estimates or claims with respect to Contractor's cost and time impacts associated with any Change Order or Construction Change Directive.

13.8 The Engineer or City at any time may direct Contractor to make changes to the Work by issuing a Field Order, so long as such changes do not require or result in any adjustment to the Contract Price or Contract Time, and are generally within the scope of the Work. Contractor shall proceed with the performance of any changes in the Work so ordered by the Engineer or City unless the Contractor believes that such Field Order entitles the Contractor to a change in the Contract Price or Contract Time, or both. In the event Contractor believes the Field Order requires a change to the Contract Price or Contract Time, it must provide written notice to the Engineer and City within five (5) business days of receipt of the Field Order and before starting with any changed Work. Failure to provide such notice waives Contractor's right to claim such work requires a change in the Contract Price or Contract Time. Once Contractor has provided timely written notice, it shall proceed as directed by City in writing, and thereafter shall file a claim in accordance with the procedures required herein.

14.0 CHANGES IN CONTRACT PRICE

14.1 The Contract Price may be changed only by a Change Order or Construction Change Directive issued in accordance with the terms of the Contract Documents. If the Change Order or Construction Change Directive provides for an adjustment to the Contract Price, the adjustment shall be based on one of the following methods: mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation; or unit prices stated in the Contract Documents or subsequently agreed upon; or cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or on a time and material basis.

14.2 In the event the Owner elects to proceed with changed work on a time and material basis, the following provisions shall apply:

- 14.2.1 For all labor, including a foreman in direct charge of the specified operations, the Contractor shall receive a sum equal to the current standard local rate of wages actually paid for every hour that the labor is actually engaged in such changed work, plus the actual cost of social security taxes, unemployment insurance, and workmen's compensation insurance based on the actual wages paid for such labor, to which cost shall be added an amount equal to ten percent (10%) thereof for all overhead and profit (including all general supervision and for furnishing and repairing small tools and ordinary equipment used in doing the changed work).
 - 14.2.2 For all materials used, the Contractor shall receive the actual cost of such materials, including freight charges as shown by original receipted bills, to which cost shall be added an amount equal to ten percent (10%) thereof for all overhead and profit.
 - 14.2.3 For any construction equipment or special equipment including fuel and lubricants therefor, required for the economical performance of the changed work, the Engineer shall allow the Contractor a rental price, to be agreed upon in writing before such work is begun, for every hour that such construction equipment or special equipment is actually operated on the work, which rental price shall include all overhead and profit. Such hourly rental price shall not exceed 1/176 part of the monthly rate stated for such equipment in the latest edition of the "Compilation of Rental Rates for Construction Equipment" by Associated Equipment Distributors.
 - 14.2.4 Subcontractors are subject to the above and the Contractor mark-up for overhead and profit shall not exceed five percent (5%) of the amount due to the Subcontractor.
 - 14.2.5 The Contractor shall keep and present, in such form as the Engineer may prescribe, an itemized accounting of all time and material costs, together with appropriate supporting data.
- 15.0 TIME FOR COMPLETION AND LIQUIDATED DAMAGES
- 15.1 Time is of the essence in the performance of the Work under this Agreement. The date of beginning and the time for completion of the Work are essential conditions of the Contract Documents. The required date of commencement of the Work shall be established in the Notice to Proceed to be issued by the City. As noted in the Agreement, Contractor shall commence the Work within ten (10) calendar days after the required date of commencement. Any Work performed by Contractor prior to the required date of commencement shall be at the sole risk of Contractor. The Notice to Proceed shall be issued within

thirty (30) days of the execution of the Agreement by the City. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement of the City and Contractor. If the Notice to Proceed has not been issued within the thirty (30) day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party by providing the City written notice of such termination, in which event such termination shall be deemed a termination for convenience of the City as set forth in Section 17.5 below. Provided, however, notwithstanding anything in the Contract Documents to the contrary, in the event of such termination pursuant to this Section 15.1, Contractor acknowledges and agrees that no payments will be due Contractor nor shall the City make any payments to Contractor for any Work that would have been authorized under the Agreement once executed by both parties.

- 15.2 The Contractor will proceed with the Work at such rate of progress to ensure Substantial Completion within the Contract Time. It is expressly understood and agreed, by and between the Contractor and the City, that the Contract Time for Substantial Completion of the Work is a reasonable period of time. The Construction Schedule shall include the date the Work must be substantially completed by Contractor and all interim milestones required by the City. Substantial Completion of the Work shall be achieved when the Work has been completed to the point where the City can occupy or utilize the Work for its intended purpose. The Engineer shall certify the date Substantial Completion of the Work is achieved. If the City has designated portions of the Work to be turned over to the City prior to Substantial Completion of the entire Work as provided in Section 15.3 below, the Engineer shall certify the date as to when Substantial Completion of such designated portions of the Work have been achieved. The entire Work shall be fully completed and ready for final acceptance by the City within 30 calendar days after Substantial Completion of the Work or thirty (30) days after Contractor's receipt of the punch list, whichever date occurs last.

15.2.1 Once the Contractor believes it has achieved Substantial Completion of the Work, it shall notify the City and Engineer in writing and request a substantial completion inspection. Concurrent with its delivery of such written notice, Contractor shall submit its initial punch list for the City's and Engineer's review. Any Work remaining to be completed or any defective work to be remedied shall be listed on the punch list. Once the substantial completion inspection has been made, Owner and Engineer shall modify the Contractor's initial punch list to include all items to be completed or repaired by Contractor in order to achieve final acceptance of the Work. Thereafter, the Engineer shall provide Contractor a copy of the final punch list. Such final punch list shall be in compliance with the Contract Documents and all applicable laws, including Section 218.735 of the Florida Statutes.

Accordingly, if the Contract Price is less than \$10 million, Engineer shall provide the final punch list to Contractor within 30 calendar days after Contractor has achieved Substantial Completion. If the Contract Price is \$10 million or more, Engineer shall provide the final punch list to Contractor within 60 calendar days after Contractor has achieved Substantial Completion. Contractor acknowledges and agrees that the failure to include any corrective work or pending items not yet completed on the punch list does not alter the responsibility of Contractor to complete all the Work required under this Contract.

15.3 The City may take early occupancy of all or any portions of the Work, at the City's election, by designating in writing to Contractor the specific portions of the Work to be occupied and the date such occupancy shall commence. If any such specific early occupancy was not expressly identified in the bidding documents issued with respect to this Agreement (as they may have been modified by any applicable Addenda) and such early occupancy adversely impacts Contractor's cost or time of performance, Contractor shall be entitled to an equitable adjustment to the Contract Price and the Contract Time, all in accordance with the other terms and conditions of the Contract Documents.

15.4 The City and Contractor recognize that, since time is of the essence for this Agreement, the City will suffer financial loss if the Work is not substantially completed within the Contract Time, as said time may be adjusted as provided for herein. In such event, the total amount of the City's damages, will be difficult, if not impossible, to definitely ascertain and quantify, because this is a public construction project that will, when completed, benefit the public. It is hereby agreed that it is appropriate and fair that the City receive liquidated damages from Contractor, if Contractor fails to achieve Substantial Completion of the Work within the required Contract Time. Should Contractor fail to substantially complete the Work within the Contract Time, the City shall be entitled to assess, as liquidated damages, but not as a penalty, the amount for liquidated damages as specified in the Agreement for each calendar day thereafter until Substantial Completion is achieved. Contractor hereby expressly waives and relinquishes any right which it may have to seek to characterize the above noted liquidated damages as a penalty, which the parties agree represents a fair and reasonable estimate of the City's actual damages at the time of contracting if Contractor fails to achieve Substantial Completion of the Work within the Contract Time.

15.4.1 In the event the Work is not fully completed within 30 days from the date of Substantial Completion, the City reserves the right to assess against Contractor its actual damages incurred as a result of such delay by Contractor.

16.0 CORRECTION OF DEFECTIVE WORK

- 16.1 Work not conforming to the requirements of the Contract Documents shall be deemed defective Work. If required by the City or Engineer, the Contractor shall as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the defective Work has been rejected by the City or Engineer, remove it from the site and replace it with non-defective Work in accordance with the Contract Documents and without additional expense to the City. Further, Contractor shall bear the expense of making good all work of other contractors performing work on the Project destroyed or damaged by such removal or replacement. Contractor shall bear all direct, indirect and consequential costs of such correction or removal (including, but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby, and shall hold the City and Engineer harmless for same. Notwithstanding anything herein to the contrary, the City may determine, at its sole discretion, to accept defective Work. If such determination is rendered prior to final payment, a Change Order or Construction Change Directive shall be executed evidencing such acceptance of such defective Work, incorporating the necessary revisions in the Contract Documents and reflecting an appropriate decrease in the Contract Price. If the City accepts such defective Work after final payment, Contractor shall promptly pay the City an appropriate amount determined by the City to adequately compensate the City for its acceptance of the defective Work.
- 16.2 If the Contractor does not take action to correct defective Work or to remove and replace rejected defective Work or if Contractor fails to comply with any of the provisions of the Contract Documents within ten (10) days after receipt of written notice from the City or Engineer, the City may correct and remedy any such deficiency at the expense of the Contractor. To the extent necessary to complete corrective and remedial action, the City may exclude Contractor from any or all of the Project site, take possession of all or any part of the Work, and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Project site and incorporate in the Work all materials and equipment stored at the Project site or for which the City has paid Contractor but which are stored elsewhere. Contractor shall allow the City, Engineer and their respective representatives, agents, and employees such access to the Project site as may be necessary to enable the City to exercise the rights and remedies under this Section. All direct, indirect and consequential costs of the City in exercising such rights and remedies shall be at Contractor's expense, and a Change Order or a Construction Change Directive shall be issued, incorporating the necessary revisions to the Contract Documents, including an appropriate decrease to the Contract Price. Such direct, indirect and consequential costs shall include, but not be limited to, fees and charges of engineers, architects, attorneys and other professionals, and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of Contractor's

defective Work. Contractor shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by the City of the City's rights and remedies hereunder.

17.0 SUSPENSION OF WORK, TERMINATION, AND DELAY

17.1 The City shall have the right to suspend the Work or any portion thereof for a period of not more than ninety (90) days or such additional time as agreed upon by the Contractor, upon giving Contractor written notice of such suspension to the Contractor. The City or Engineer shall fix the date on which Work shall be resumed. The Contractor will resume that Work on the date so fixed unless otherwise directed by the City. Provided Contractor strictly complies with the Change Order and Claims procedures set forth in the Contract Documents, Contractor will be entitled to a Change Order adjusting the Contract Price and Contract Time, as provided in the Contract Documents, to the extent attributable to any such suspension, unless said suspension is due to the fault or neglect of Contractor or anyone for whom Contractor is responsible.

17.2 If, through no act or fault of the Contractor, the Work is suspended for a period of more than ninety (90) days by the City or under an order of court or other public authority, or the Engineer fails to act on any request for payment within thirty (30) days after it is submitted, or the City fails to pay the Contractor any undisputed amounts within thirty (30) days of its approval, then the Contractor may after ten (10) days from delivery of a written notice to the City and the Engineer and the City's failure to cure such default (or a maximum of sixty (60) days in the event the default cannot reasonably be cured within ten (10) days provided that the City commences to cure within ten (10) days and thereafter diligently and continuously pursues said cure) terminate the Agreement and recover from the City payment for all Work properly executed and reasonable termination expenses sustained. In addition, and in lieu of terminating the Agreement, if the Engineer has failed to act on a request for payment or if the City has failed to make any payment within the aforesaid thirty (30) day periods, the Contractor may upon ten (10) days written notice to the City and the Engineer stop the Work until paid all amounts then due, in which event and upon resumption of the Work, a Change Order shall be issued adjusting the Contract Price and Contract Time as provided in the Contract Documents.

17.3 Contractor shall be considered in material default of the Agreement and such default shall be considered cause for the City to terminate the Contractor's right to continue to perform under the Agreement, in whole or in part, as further set forth in this Section, if Contractor: (1) fails to begin the Work under the Contract Documents within the time specified herein; or (2) fails to properly and timely perform the Work as directed by the City or Engineer or as provided for in the approved Construction Schedule; or (3) performs the Work unsuitably or

neglects or refuses to remove materials or to correct or replace such Work as may be rejected as unacceptable or unsuitable; or (4) discontinues the prosecution of the Work contrary to the requirements of the Agreement; or (5) fails to resume Work which has been suspended within a reasonable time after being notified to do so; or (6) becomes insolvent or is declared bankrupt, or commits any act of bankruptcy; or (7) allows any final judgment to stand against it unsatisfied for more than ten (10) days; or (8) makes an assignment for the benefit of creditors; or (9) fails to comply with any applicable codes, laws, ordinances, rules or regulations with respect to the Work; or (10) fails to supply sufficient skilled workmen or suitable materials or equipment; or (11) fails to promptly pay its Subcontractors and Suppliers; or (12) disregards the authority of the City or Engineer; or (12) materially breaches any other provision of the Contract Documents. In rendering its decision as to whether one of the causes under Section 17.3 exist which would permit the City to terminate the Agreement, the City shall be entitled to rely upon the determination of the Engineer concerning such matter.

17.3.1 In such event, and after giving the Contractor and its surety a minimum of ten (10) days from delivery of a written notice to cure any such default (or a maximum of sixty (60) days in the event the default cannot reasonably be cured within ten (10) days provided that Contractor commences to cure within ten (10) days and thereafter diligently and continuously pursues said cure), the City may at its option, and without releasing or waiving its rights and remedies against Contractor's sureties and without prejudice to any other right or remedy, terminate Contractor's right to proceed under the Agreement in whole or in part, and take possession of the Project and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor, take assignments of any of Contractor's subcontracts and purchase orders that the City may designate, and finish the Work by whatever method the City in its sole discretion may deem expedient.

17.3.2 If Contractor's right to proceed under the Agreement is terminated, Contractor shall not be entitled to receive any further payment until the Work is finished. All monies expended and all of the costs, losses, damages and extra expenses, including all management, administrative and other overhead and other direct and indirect expenses (including Engineer and attorneys' fees) or damages incurred by the City incident to such completion (collectively "Completion Costs"), shall be deducted from the unpaid balance of the Contract Price. Upon the City's completion, if the unpaid balance of the Contract Price exceeds the Completion Costs, such excess shall be paid to the Contractor. If the Completion Costs exceed the unpaid balance of the Contract Price, Contractor shall pay promptly to the City on demand the full amount of such excess and interest thereon at a rate of 6% per annum until paid.

17.3.3 The liability of Contractor hereunder for Completion Costs shall extend

to and include the full amount of any and all sums paid, expenses and losses incurred, damages sustained, and obligations assumed by the City in good faith under the belief that such payments or assumptions were necessary or required, in completing the Work and providing labor, materials, equipment, supplies, and other items therefor or re-letting the Work, and in settlement, discharge or compromise of any claims, demands, suits, and judgments pertaining to or arising out of the Work hereunder. Further, in the event the City has exercised its right to terminate due to Contractor's default, Contractor shall be prohibited from bidding or otherwise seeking additional work from the City in accordance with the City's then current debarment policy.

17.3.4 The City may deduct from any payment, any sum owed by the City to Contractor, either under this Agreement or any other agreement between the City and the Contractor. Further, a default by Contractor under any other agreement with the City shall be deemed a default under this Agreement and a default under this Agreement shall be deemed a default under any other agreement between the City and Contractor.

17.4 Where the Contractor's services have been so terminated by the City, said termination shall not affect any right of the City against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the City due the Contractor will not release the Contractor from compliance with the Contract Documents. Further, if after notice of termination of Contractor's right to proceed pursuant to Section 17.3, it is determined for any reason that Contractor was not in default, or that its default was excusable, or that the City is not entitled to the remedies against Contractor provided herein, then such termination shall be deemed a termination for the City's convenience and Contractor's remedies against the City shall be the same as and limited to those afforded Contractor under Section 17.5 below.

17.5 The City shall have the right to terminate this Agreement without cause upon ten (10) days from delivery of a written notice to the Contractor. In the event of such termination for convenience, Contractor's sole and exclusive recovery against the City shall be limited to that portion of the Contract Price earned through the date of termination, together with any retainage withheld and reasonable termination expenses incurred, but Contractor shall not be entitled to any other or further recovery against the City, including, but not limited to, damages or any anticipated profit on portions of the Work not performed.

18.0 PAYMENT TO CONTRACTOR

18.1 At least ten (10) days before submitting the first Application for Payment, the Contractor shall submit to the City and Engineer a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the City or Engineer may require. It is

anticipated the schedule of values substantially will be based upon the Contractor's completed Bid Proposal Form, attached as Section 00030. This schedule, unless objected to by the City or Engineer, shall be used as a basis for reviewing the Contractor's Applications for Payment. On or before the 25th of each month, the Contractor will submit to the Engineer an Application for Payment filled out and signed by the Contractor covering the Work performed since the previous month's Application for Payment. The Application for Payment may also include the cost of such materials and equipment which are suitably stored either at or off the site to the extent such payment is approved by City as provided in Section 18.1.1 below. Invoices received after the 25th day of each month shall be considered for payment as part of the next month's Application for Payment. Contractor's Application for Payment shall be in such form and contain such detail and backup as the City reasonably may require.

18.1.1 If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at or off the site, the Application for Payment shall also be accompanied by such supporting data, satisfactory to the City, as will establish the City's title to the material and equipment free and clear of all liens, charges, security interests and encumbrances, together with evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect City's interest therein, all of which shall be subject to City's satisfaction. City has the discretion whether or not to pay for such unincorporated materials.

18.1.2 The Engineer will, within ten (10) days after receipt of each Application for Payment, indicate in writing its recommendation as to that portion of the payment being requested by Contractor in the Application for Payment which Engineer believes is due and payable. The City shall pay Contractor that portion of the Application for Payment approved by Engineer and Owner within fifteen (15) days of the City's receipt of the Engineer's payment recommendation.

18.1.3 City shall retain an amount equal to 10% of the approved amount to be paid Contractor under each monthly Application for Payment. The retainage shall be accumulated and not released to Contractor until final payment is due. Provided, however, the City reserves the right, in its sole discretion, to reduce such retainage prior to final payment; but at no time shall the retainage be reduced to less than five percent (5%) prior to Contractor achieving Substantial Completion. Provided, further however, if at any time during this Agreement, and in the City's sole discretion, the City becomes dissatisfied with Contractor's performance or if Contractor is in default, the City shall have the right to reinstate the full amount of retainage at ten percent (10%).

- 18.1.4 Monthly payments to Contractor shall in no way imply approval or acceptance of the Work.
- 18.1.5 Each Application for Payment shall be accompanied by a claim release and waiver in the form set forth in the City's Project Administration Manual from Contractor for all materials, labor, equipment, services and other bills associated with that portion of the Work payment is being requested in that Application for Payment . Further, each Application for Payment shall be accompanied by a claim release and waiver in the form set forth in the City's Project Administration Manual from all Subcontractors and Suppliers evidencing their payment in full through the previous month's Application for Payment. Also, each Application for Payment shall be accompanied by an updated Construction Schedule, a list inventorying all stored materials, a monthly progress status report, and any other document reasonably requested by City. The City shall not be required to make payment until and unless such releases, documents and information are furnished by Contractor. Further, if Contractor is withholding any portion of a payment to any Subcontractor or Supplier for any labor, services, or materials for which the City has paid Contractor, Contractor agrees to refund such money to the City upon demand by the City.
- 18.1.6 Engineer shall review each Application for Payment submitted by Contractor and shall make recommendations to the City as to the proper amounts, if any, which may be owed Contractor thereunder. Both Engineer and the City shall have the right to refuse to approve payment amounts, or portions thereof, requested by Contractor in an Application for Payment, or rescind any amount previously approved, and the City may withhold any payments otherwise due Contractor under this Agreement or any other agreement between the City and Contractor, to the extent it is reasonably necessary, to protect the City from any expense, cost or loss attributable to: (a) defective or deficient Work not properly remedied in accordance with the terms of the Contract Documents; (b) the filing or reasonable evidence indicating the probable filing of third party claims against the City attributable to the fault or neglect of Contractor; (c) Contractor's failure to make timely and proper payments to all Subcontractors and Suppliers; (d) reasonable evidence that the remaining Work cannot be completed for the unpaid Contract Price balance; (e) reasonable evidence indicating that the remaining Work cannot be completed within the remaining Contract Time; (f) Contractor's failure to satisfactorily prosecute the Work in accordance with the requirements of the Contract Documents; or (g) any other material breach of the requirements of the Contract Documents by Contractor. The City shall have the right, but not the obligation, to take any corrective action the City deems appropriate to cure any of the

above noted items, at Contractor's expense, if such items are not cured by Contractor to the City's reasonable satisfaction within three (3) days after Contractor's receipt of written notice from the City.

- 18.1.7 Engineer or City may reject an Application for Payment, in whole or in part, submitted by Contractor if such Application for Payment is not submitted in strict accordance with the requirements of this Article 18. In such event, Engineer or City shall notify Contractor in writing within twenty (20) business days after receipt of such Application for Payment that such Application for Payment, or portion thereof, has been rejected and the reasons for such rejection. If Contractor resubmits a corrected Application for Payment correcting, in Engineer's and Owner's sole determination, the deficiency specified in the rejection notice, then City shall pay Contractor the corrected portion of the Application for Payment within ten business days after the date the corrected Application for Payment is received by City.
- 18.2 Prior to Substantial Completion, the City, with the approval of the Engineer, may use any completed or substantially completed portions of the Work. Such use shall not constitute an acceptance of such portions of the Work.
- 18.3 The City shall have the right to enter the Project site for the purposes of doing work not covered by the Contract Documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the Work, or the restoration of any damaged Work except such as may be caused by agents or employees of the City.
- 18.4 Upon completion and acceptance of the Work, the Engineer shall issue a certificate attached to the final payment request that states the Work has been fully performed in accordance with the requirements of the Contract Documents and that Engineer recommends final payment in the amount reflected in the attached final payment request. The City shall make final payment to Contractor within thirty (30) days after the Work is finally accepted by the City, provided that Contractor first, and as an explicit condition precedent to the accrual of Contractor's right to final payment, shall have furnished the City with a properly executed and notarized final release in the form set forth in the City's Project Administration Manual, as well as, a duly executed copy of the surety's consent to final payment and such other documentation that may be required by the Contract Documents or the City.
- 18.5 Late payments shall accrue interest from the date payment was due until payment is received at the rate of six percent (6%) per annum.
- 18.6 No error or oversight in the making of payment or completion certificates shall relieve the Contractor from its obligation to do and complete the Work in

accordance with the requirements of the Contract Documents.

19.0 ACCEPTANCE OF FINAL PAYMENT AS RELEASE

19.1 The acceptance by the Contractor of final payment shall be and shall operate as a full release and waiver of any and all claims by Contractor against the City arising out of this Agreement or otherwise relating to the Project, except those identified in writing by Contractor as unsettled in its final Application for Payment. Any payment, however, final or otherwise shall not release the Contractor or its sureties from any obligations under the Contract Documents or the Performance and Payment Bonds. Neither the acceptance of the Work nor payment by the City shall be deemed to be a waiver of the City's right to enforce any obligations of Contractor hereunder or to the recovery of damages for defective Work not discovered by the City or Engineer at the time of final inspection.

20.0 CONTRACT SECURITY

20.1 The Contractor shall within ten (10) days after the receipt of the Notice of Award and prior to the start of any Work furnish the City with a Performance Bond and a Payment Bond in penal sums equal to 100% of the amount of the Contract Price and in the forms attached as Sections 00060 and 00070. Such Bonds shall be executed by the Contractor and a corporate bonding company licensed to transact such business in the State of Florida and named on the current lists of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570 and approved by the City. The expense of these Bonds shall be borne by the Contractor. If at any time a surety on any such Bond is declared as bankrupt or loses its rights to do business in Florida or is removed from the list of Surety Companies accepted on Federal Bonds, Contractor shall within ten (10) days after notice from the City to do so, substitute an acceptable Bond (or Bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the City. The premiums on such replacement Bond shall be paid by the Contractor. No further payment shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable Bond to the City.

20.2 The Contractor and its Surety, for value received, hereby stipulate and agree that any and all claims, demands, actions or suits whatsoever, arising under this Agreement and/or bonds, shall be subject to the sole and exclusive jurisdiction and venue of the appropriate state court in and for Bay County, Florida. The Contractor and its Surety do agree, by execution of these documents, that the sole and exclusive jurisdiction and venue in said forum is proper and appropriate since performance of the underlying contract for which these documents are executed is to be accomplished within Bay County, Florida.

21.0 ASSIGNMENTS

21.1 Contractor shall not assign this Agreement or any part thereof, without the prior consent in writing of the City, which consent shall be at City's' sole discretion. If Contractor does, with City's written approval, assign this Agreement or any part thereof, Contractor shall not be released from any of its obligations or responsibilities under this Agreement.

22.0 INDEMNIFICATION AND HOLD HARMLESS

22.1 To the maximum extent permitted by Florida law, Contractor shall indemnify and hold harmless the City and its officers and employees from any and all liabilities, claims, damages, penalties, demands, judgments, actions, proceedings, losses or costs, including, but not limited to, reasonable attorneys' fees and paralegals' fees, whether resulting from any claimed breach of this Agreement by Contractor or from personal injury, property damage, direct or consequential damages, or economic loss, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of Contractor or anyone employed or utilized by the Contractor in the performance of this Agreement.

22.2 Contractor's obligation to indemnify and hold harmless under this Article 22 will survive the expiration or earlier termination of this Agreement until it is determined by final judgment that an action against the City or an indemnified party for the matter indemnified hereunder is fully and finally barred by the applicable statute of limitations.

22.3 The obligation of the Contractor under this Article 22 shall not extend to the liability of the Engineer, its agents or employees arising out of the preparation of approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications.

23.0 SEPARATE CONTRACTS AND COOPERATION

23.1 The City reserves the right to perform other work related to the Project at the site by the City's own forces, have other work performed by utility owners or let other direct contracts for work to be constructed at the same time, and in connection with, the Work included in this Agreement. The Contractor shall cooperate with all other contractors in such a manner, and to such extent, as best to facilitate the completion of the entire Project in the shortest time possible, subject to, at all times, the approval of the Engineer and Owner. It shall be the duty of each contractor to work with the other contractors, render such assistance, and to arrange its work in such a manner that shall allow the entire Project to be delivered complete and in the best possible condition. The Contractor shall afford other contractors and utility owners reasonable opportunity for the

introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate the Work with theirs. If the proper execution or results of any part of the Contractor's Work depends upon the work of any other Contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results.

- 23.2 If the performance of additional work by other contractors, utility owners, or the City is not noted in the Contract Documents prior to the execution of the Agreement, written notice thereof shall be given to the Contractor prior to starting any such additional work. If the Contractor believes that the performance of such undisclosed additional work by the City or others involves it in additional expense or entitles it to an extension of the Contract Time, the Contractor shall send written notice of that fact to the City and Engineer within seven (7) calendar days of being notified of the other work and the Contractor may make a claim thereof as provided in Sections 13 and 14. If Contractor fails to send the above required seven (7) calendar days' notice, Contractor will be deemed to have waived any rights it otherwise may have had to seek an extension to the Contract Time or adjustment to the Contract Price.
- 23.3 Contractor shall afford each utility owner and City's other contractors (or the City, if the City is performing the additional work with the City's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work and shall properly connect and coordinate its Work with theirs. Contractor shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. Contractor shall be responsible for all damage to the work of others caused by the performance of its Work. Further, Contractor shall not in any way cut or alter the work of others without first receiving the written consent of that other person and Engineer. If any part of Contractor's Work depends for proper execution or results upon the work of any other contractor or utility owner (or the City), Contractor shall inspect and promptly report to Engineer in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. Such report must be made within three (3) business days of the time Contractor first became aware of the delay, defect or deficiency. Contractor's failure to report within the allotted time will constitute an acceptance of the other work as fit and proper for integration with Contractor's Work, except for latent defects not discovered by Contractor.
- 23.4 The Contractor shall keep itself fully informed at all times regarding all details of the work of other contractors working at the site, and it shall be responsible for all delays that may result from its failure to install the Work in the proper manner and at the proper time.

23.5 The Contractor shall be responsible for coordinating the relocation of existing utilities (with the respective utility companies) as needed to construct the Project. Attention is called to the fact that Contractor is responsible for contacting all utility companies to obtain locations of all existing utilities or obstructions which it may encounter during construction. After location of utilities by the appropriate utility company, it is the Contractor's liability to protect all such utility lines, including service lines and appurtenances, and to replace at its own expense any which may be damaged by the Contractor's equipment or forces during construction of the Project. The City will pay fees charged by the utility company for relocating these utilities.

24.0 SUBCONTRACTING

24.1 Contractor shall review the design and shall determine how it desires to divide the sequence of construction activities. Contractor will determine the breakdown and composition of bid packages for award of subcontracts, based on the current Construction Schedule, and shall supply a copy of that breakdown and composition to the City and Engineer for their review and approval. The Contractor may utilize the services of specialty Subcontractors on those parts of the Work which, under normal contracting practices, are performed by specialty Subcontractors. Contractor shall be solely responsible for and have control over the Subcontractors.

24.2 Prior to submitting its first Application for Payment, Contractor shall submit to the City a list of the names, addresses, licensing information and phone numbers of the Subcontractors Contractor intends to use for each portion of the Work, as well as identifying in writing those portions of the Work it intends to perform with its own employees. The Contractor shall not use a Subcontractor or Supplier against whom the Owner has a reasonable objection. The list identifying each Subcontractor cannot be modified, changed, or amended without prior written approval from the City. Contractor shall continuously update that list, so that it remains current and accurate throughout the entire performance of the Work. Any and all work to be self-performed by Contractor must be approved in writing by the City in its sole discretion prior to commencement of such Work. The Contractor shall not award work to Subcontractor(s) in excess of fifty percent (50%) of the Contract Price, without prior written approval of the City.

24.3 The Contractor shall be fully responsible for and have control over the acts and omissions of its Subcontractors, and of persons either directly or indirectly employed by them, as the Contractor is for the acts and omissions of persons directly employed by it.

24.4 The Contractor shall cause appropriate provisions to be inserted in all Subcontracts relative to the work to bind Subcontractors to the Contractor by the terms of the Contract Documents insofar as applicable to the work of

Subcontractors and give the Contractor the same power to terminate any subcontract that the City may exercise over the Contractor under any provision of the Contract Documents. Further, each subcontract shall require that any claims by a Subcontractor for delay or additional cost must be submitted to Contractor within the time and in the manner in which Contractor must submit such claims to the City, and that failure to comply with such conditions for giving notice and submitting claims shall result in the waiver of such claims.

- 24.5 All subcontracts between Contractor and its Subcontractors shall be in writing and are subject to the City's approval. Further, all subcontracts shall (1) require each Subcontractor to be bound to Contractor to the same extent Contractor is bound to the City by the terms of the Contract Documents, as those terms may apply to the portion of the Work to be performed by the Subcontractor, (2) provide for the assignment of the subcontracts from Contractor to the City at the election of the City upon termination of Contractor, (3) provide that the City will be an additional indemnified party of the subcontract, (4) provide that the City will be an additional insured on all insurance policies required to be provided by the Subcontractor except workmans' compensation, (5) assign all warranties directly to the City, and (6) identify the City as an intended third-party beneficiary of the subcontract.
- 24.6 Nothing contained in this Agreement shall create any contractual relation between any Subcontractor or Supplier and the City. All subcontracts and purchase orders entered into by Contractor must be in writing, and upon demand from City, Contractor shall deliver to City a full and complete copy of any or all such subcontracts and purchase orders.
- 24.7 Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract, copies of the Contract Documents to which the Subcontractor will be bound. Each Subcontractor shall similarly make copies of such documents available to its sub-subcontractors.
- 24.8 The Contractor shall not use a Subcontractor or Supplier against whom the City has a reasonable objection and Contractor shall not be required to contract with anyone it reasonably objects to.
- 24.8 The City and Engineer are under no duty or obligation whatsoever to any Subcontractor, Supplier, laborer or other party to ensure that payments due and owing by the Contractor to any of them will be made. Such parties shall rely only on the Contractor's surety bonds for remedy of nonpayment by the Contractor.
- 25.0 ENGINEER'S AUTHORITY
- 25.1 The Engineer shall act as the City's representative during the construction period, shall decide questions which may arise as to quality and acceptability of

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materials furnished and Work performed, and shall interpret the intent of the Contract Documents in a fair and reasonable manner. The Engineer will make visits to the site and determine if the Work is proceeding in accordance with the Contract Documents.

- 25.2 The Contractor will be held strictly to the intent of the Contract Documents in regard to the quality of materials, workmanship, and execution of the Work. Inspections may be at the factory or fabrication plant of the source of material supply.
- 25.3 The Engineer and the City will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.
- 25.4 The Engineer shall promptly make decisions relative to interpretation of the Contract Documents.

26.0 LAND AND RIGHT-OF-WAYS

- 26.1 Prior to the issuance of the NOTICE TO PROCEED, the City shall obtain all land and rights-of-way necessary for carrying out and for the completion of the Work to be performed pursuant to the Contract Documents, unless otherwise noted in the Contract Documents.
- 26.2 The City shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.
- 26.3 The Contractor shall provide at its own expense and without liability to the City any additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of materials.

27.0 GUARANTEE

- 27.1 The Contractor warrants to the City and Engineer that materials and equipment furnished under the Agreement will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Contractor further warrants to the City that all materials and equipment furnished under the Contract Documents shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturers, fabricators, suppliers or processors except as otherwise provided for in the Contract Documents. Further, any special warranty to be provided will be in such form as is acceptable to the City and shall not include any exclusions, exceptions or modifications except to the extent approved by the City in its sole discretion. Work not conforming to these requirements, including substitutions

not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear from normal usage. If required by the Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

27.2 Contractor expressly warrants to the City that it shall promptly correct, upon receipt of written notice from the City, any portion of the Work which is found to be defective or otherwise not in conformance with the requirements of the Contract Documents. The City will give notice of observed defects with reasonable promptness. Provided, however, in the event that any defective or non-conforming Work is determined by the City in its sole discretion to present an immediate threat to safety or security, the City shall be entitled to correct or replace such defective or non-conforming portions of the Work, and Contractor shall reimburse the City for all costs and expenses incurred by the City in correcting or replacing such Work. In the event that the Contractor should fail to make such repairs, adjustments, or other work that may be made necessary by such defects, the City may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period. With respect to the correction or replacement of any defective or nonconforming Work, Contractor shall be liable for all damage to any part of the Work itself and to any adjacent property which is caused by such corrective or replacement work.

27.3 If, within one year after the date of final acceptance of the Work by the City, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the City to do so unless the City has previously given the Contractor an express written acceptance of such condition. The City shall give such notice promptly after discovery of the condition. If the Contractor fails to correct nonconforming Work within a reasonable period of time (not to exceed 10 days) after receipt of notice from the City or Engineer, the Owner may correct or replace it in accordance with Section 27.2 above. This one year correction period is in addition to all other rights and does not limit the time period the City can seek to have the defective Work corrected.

27.4 Contractor shall obtain and assign to the City all express warranties given to Contractor by any Subcontractors or by Suppliers.

28.0 CLAIMS AND DISPUTES

28.1 The term "Claim" as used herein shall mean any and all demands made by one party hereunder against the other party, whether such demand be for money,

time or the assertion of any right or obligation that arises out of the Contract Documents.

- 28.2 Initial notice of Claims by Contractor shall be made in writing to the City and Engineer within seven (7) calendar days after the first day of the event giving rise to such Claim or such other time period as may be expressly provided in the Contract Documents. If Contractor fails to give such written notice within the required time period, Contractor shall be deemed to have waived the Claim. Written data supporting Contractor's claim shall be submitted to the City and Engineer within thirty (30) calendar days after the occurrence of the event, or such other time period as may be expressly provided in the Contract Documents, unless the City grants additional time in writing, or else Contractor shall be deemed to have waived the Claim.
- 28.3 Contractor shall proceed diligently with its performance as directed by the City, regardless of any pending Claim, unless otherwise agreed to by the City in writing. The City shall continue to make payments of all undisputed amounts in accordance with the Contract Documents during the pendency of any Claim.
- 28.4 Prior to the initiation of any action or proceeding permitted by this Agreement to resolve disputes between the parties, the parties shall make a good faith effort to resolve any such disputes by negotiation between the President or Vice-President for the Contractor and the City Manager. Failing resolution, and prior to the commencement of depositions in any litigation between the parties with respect to the Project, the parties shall attempt to resolve the dispute through mediation before an agreed-upon Circuit Court Mediator certified by the State of Florida. Should either party fail to submit to mediation as required hereunder, the other party may request a court of law to order mediation under Florida Statutes Section 44.102.
- 28.5 Any litigation between the City and Contractor (which term for the purposes of this Section shall include Contractor's surety), whether arising out of any Claim or arising out of the Agreement or any breach thereof, shall be brought, maintained and pursued solely and exclusively in the appropriate State courts of the State of Florida as set forth in Section 20.2. The City and Contractor each hereby waive and renounce any and all rights and options which they, or either of them, have or might have to bring or maintain any such litigation or action in the Federal Court system of the United States or in any United States Federal District Court. Venue of any such litigation between the City and Contractor shall lie and be only in the appropriate State courts in and for Bay County, Florida. Contractor consents and submits to the exclusive jurisdiction of any such court and agrees to accept service of process from the State of Florida in any matter to be submitted to any such court.

29.0 TAXES

29.1 The Contractor will pay all applicable sales, consumer, use and other similar taxes required by the laws of the place where the Work is performed.

30.0 CONTRACT TIME, SCHEDULE OF WORK AND TIME EXTENSIONS

30.1 Contractor shall diligently pursue the completion of the Work and coordinate the Work being done on the Project by its Subcontractors and Suppliers, as well as coordinating its Work with all work of others at the Project site, so that its Work or the work of others shall not be delayed or impaired by any act or omission by Contractor or anyone for whom Contractor is liable. All Work under this Agreement shall be arranged and be carried out in such a manner as to complete the Work on or before the required date of Substantial Completion. The Contractor must notify the City at the time of bidding if the chronology of the Work as shown or the subdivision of work will affect warranties or guarantees in any way. No such claims shall be allowed once the Work has begun.

30.2 Should Contractor be obstructed or delayed in the prosecution of or completion of the Work as a result of unforeseeable causes beyond the control of Contractor, and not due to its fault or neglect, including but not restricted to acts of God or of the public enemy, acts of government, fires, floods, epidemics, quarantine regulation, strikes, lockouts, unusually severe weather conditions by comparison with the ten-year Bay County, Florida average not reasonably anticipatable (to the extent Contractor was unable to perform any portion of the Work that was on the critical path of the approved Construction Schedule during those inclement weather days), Contractor shall notify Owner and Engineer in writing within seven (7) calendar days after the commencement of such delay, stating the cause or causes thereof, or be deemed to have waived any right which Contractor may have had to request a time extension.

30.3 The Contractor is required to furnish adequate manpower at the Project to complete the Work within the Contract Time and in accordance with the Construction Schedule. Should payment of premium time, bonuses, or the like be necessary to attract sufficient manpower for the Project, such extra labor costs shall be borne by the Contractor without additional compensation from the City. Further, should the Contractor's Work, through no fault of the Engineer, the City, or City's other contractors, fail to progress in accordance with the Construction Schedule, and if, in the opinion of the Engineer, the Work cannot be substantially completed within the Contract Time, or if deemed necessary to protect this or adjoining work from damage, the Contractor shall work such additional time over the established hours of work, but excluding Holidays, as required to meet the schedule time without additional expense to the City. In such event, Contractor shall reimburse City for any additional costs incurred by the City associated with such overtime, including any additional costs of the

Engineer.

30.4 When so ordered in writing by the Engineer or City, whether to advance the date of Substantial Completion, or for any other reason for the City's benefit, the Contractor shall work overtime and or additional shifts. If the order for such acceleration is not the result of Contractor being behind the approved Construction Schedule, Contractor shall be entitled to a Change Order increasing the Contract Price by its actual net premium costs of such overtime and or shifts so ordered and so worked, including insurance and taxes applicable thereto, (without other overhead or profit). Such costs and expenses shall be subject to audit by the City.

30.5 When any period of time is referenced by days herein, it shall be computed to exclude the first day 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 recognized by the City as a legal holiday, such day shall be omitted from the computation, and the last day shall become the next succeeding day which is not a Saturday, Sunday or legal holiday. The term "business day" as used herein shall mean all days of the week excluding Saturdays, Sundays and all legal holidays observed by the City.

31.0 USE OF SITE

31.1 The Contractor shall confine its use of the site for storage of materials, erection of temporary facilities and parking of vehicles to areas within its Agreement limits as directed by the Engineer. The Contractor shall not unnecessarily encumber the site at any time.

31.2 Contractor acknowledges that areas of the site in which Work under this Agreement may be performed may be used by other contractors for storage of materials, erection of temporary facilities and parking of vehicles. Areas used by other contractors will be vacated, as directed by the Engineer to permit Work under this Agreement, provided reasonable notice is given requesting such, all in accordance with the approved Construction Schedule.

31.3 No signs or advertisements shall be displayed on the site or building except with the written consent of the City.

32.0 TEMPORARY FACILITIES

32.1 The Contractor shall provide electric power and water as it may require for its construction purposes, and shall pay all costs incurred. At completion of the Work, all temporary facilities shall be removed from the site. Upon Substantial Completion of the Work, Contractor shall cause all permanent utilities to be utilized by the City that were in Contractor's name during construction of the Project to be transferred over to the City's name.

32.2 The Contractor shall provide sanitary facilities for its workmen at all times. Sanitary facilities shall be of an approved chemical type with regular servicing and appropriately screened from public view, as approved by the Engineer and all applicable health authorities.

33.0 CLEAN UP AND DISPOSAL OF WASTE MATERIALS AND HAZARDOUS MATERIALS

33.1 No burial of waste materials will be permitted on the site. The Contractor shall at all times keep the site free from accumulations of waste material or debris caused by its operations and shall immediately remove same when necessary or required by the Engineer or the City. If Contractor fails to keep the Project site clean, the City has the right, after providing a twenty-four (24) hour written notice, to perform any required clean up and to backcharge Contractor for the costs of such clean up. At the completion of the Work, and before final inspection and acceptance of the Work, Contractor shall clean ditches, shape shoulders and restore all disturbed areas, including street crossings, grass plots, regrassing if necessary, to as good condition as existed before Work started, and remove all debris, rubbish and waste materials from and about the Project site, as well as all of Contractor's (and its Subcontractors') tools, appliances, construction equipment and machinery and surface materials, and shall leave the Project site clean and ready for occupancy by the City. Any existing surface or subsurface improvements, including, but not limited to, pavements, curbs, sidewalks, pipes, utilities, footings, structures, trees and shrubbery, not indicated in the Contract Documents to be removed or altered, shall be protected by Contractor from damage during the prosecution of the Work. Any such improvements so damaged shall be restored by Contractor to condition at least equal to that existing at the time of Contractor's commencement of the Work

33.2 If Contractor encounters on the Project site any materials reasonably believed by Contractor to be petroleum or petroleum related products or other hazardous or toxic substances which have not been rendered harmless, Contractor immediately shall (i) stop Work in the area affected and (ii) report the condition to the City in writing. If the Work is so stopped and hazardous material is found, the Work in the affected area shall not thereafter be resumed except by Change Order. Any such Change Order shall include, but not be limited to, an equitable adjustment to the Contract Time and Contract Price as appropriate and in accordance with the terms of the Contract Documents. If no hazardous material is found after the Work is stopped, no Change Order is required to resume the Work in the affected area. Further, if the hazardous material was generated or caused by Contractor or anyone for whom Contractor is responsible, or if Contractor failed to stop Work or give the written notice required above, no Change Order will be required for an adjustment in the Contract Time or Contract Price and Contractor shall indemnify the City and hold the City harmless for any

costs incurred by the City with respect to such hazardous material generated or caused by Contractor or anyone for whom it is responsible or any increased costs incurred by City as a result of Contractor's failure to stop Work or give the required written notice.

34.0 WARRANTY OF TITLE

34.1 No material, supplies or equipment for the Work shall be purchased by the Contractor subject to any chattel mortgage or under a conditional sale or other agreement by which a lien or an interest therein or any part thereof is retained by the seller or supplier. The Contractor warrants good title to all materials, supplies and equipment installed or incorporated in the Work and title to all such items shall pass to the City upon its incorporation into the Work or payment, whichever occurs first. Contractor shall, at all times, keep the site, together with all improvements and appurtenances constructed or placed thereon by it, free from any claims, liens or charges and further agrees that neither Contractor nor any person, firm, or corporation furnishing any material or labor for any Work covered by this Agreement shall have any right to a lien upon the Work, site or any improvements or appurtenances thereon. The Contractor shall not at any time suffer or permit any lien, attachment, or other encumbrances under the law of Florida or otherwise by any person or persons whomsoever to remain on file with the City against any money due or to become due for any work done or materials furnished under the Agreement or by reason of any other claim or demand against the Contractor. Such lien, attachment, or other encumbrance, until it is removed, shall preclude any and all claims or demands for any payment to Contractor under virtue of this Agreement.

35.0 OWNERSHIP OF HIDDEN VALUABLE MATERIALS

35.1 All items having any apparent historical or archaeological interest or treasure or valuable materials discovered during any construction activities shall be carefully preserved and reported immediately to the City for determination of appropriate actions to be taken. Any increases to Contractor's time or cost of performance due to historical or archaeological items discovered on the site shall entitle Contractor to a Change Order equitably adjusting the Contract Time and the Contract Price as appropriate and in accordance with the terms of the Contract Documents. Notwithstanding anything in the Contract Documents to the contrary, Contractor shall have no claim or entitlement to any such historical or archaeological interest or treasure or other valuable materials discovered, and all such items shall remain the property of the City.

36.0 AS-BUILT PLANS and DOCUMENTS TO BE KEPT AT THE SITE

36.1 Before final inspection the Contractor shall turn over to the Engineer a set of drawings showing field changes and actual installed conditions.

CONTRACTOR shall provide to the ENGINEER two (2) hard copies and one (1) electronic copy of the as-built plans in accordance with the requirements in Appendix B of these Specifications.

- 36.2 Contractor shall maintain at the Project site or such other place as may be expressly approved in writing by Owner, originals or copies of, on a current basis, all Project files and records, including, but not limited to, the following administrative records: Subcontracts and Purchase Orders; Subcontractor Licenses; Shop Drawing Submittal/Approval Logs; Equipment Purchase/Delivery Logs; Contract Drawings and Specifications with Addenda; Warranties and Guarantees; Cost Accounting Records; Payment Request Records; Meeting Minutes; Insurance Certificates and Bonds; Contract Changes; Permits; Material Purchase Delivery Logs; Technical Standards; Design Handbooks; "As-Built" Marked Prints; Operating & Maintenance Instruction; Daily Progress Reports; Monthly Progress Reports; Correspondence Files; Transmittal Records; Inspection Reports; Bid/Award Information; Bid Analysis and Negotiations; Punch Lists; and a Construction Schedule (including all updates). The Project files and records shall be available at all times to the City and Engineer or their designees for reference, review or copying.

37.0 SILENCE OF SPECIFICATIONS

- 37.1 To the extent the Work involves road or bridge construction, the apparent silence of the Contract Documents as to any details or the omission from them of a detailed description concerning any point shall be regarded as meaning that such portion of the Work shall be performed in accordance with the latest edition of the Florida DOT Standard Specifications for Road and Bridge Construction.

38.0 GRATUITIES

- 38.1 If the City finds after a notice and hearing that the Contractor, or any of the Contractor's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts or otherwise) to any official, employee, or agent of the City, the State, or other officials in an attempt to secure this Agreement or favorable treatment in awarding, amending, or making any determinations related to the performance of this Agreement, the City may, by written notice to the Contractor, terminate this Agreement for Contractor default. The City may also pursue other rights and remedies that the law or this Agreement provides.
- 38.2 In the event this Agreement is terminated as provided in Section 38.1, the City may pursue the same remedies against the Contractor as it could pursue in the event of a breach of the Agreement by the Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, the City may pursue exemplary damages in an amount (as determined by the City) which shall be not

less than three nor more than ten times the costs the Contractor incurs in providing any such gratuities to any such official, agent or employee of the City.

39.0 AUDIT AND ACCESS TO RECORDS

39.1 Contractor shall keep all records and supporting documentation which concern or relate to the Work hereunder for a minimum of three (3) years from the date of termination of this Agreement or the date the Project is completed, whichever is later or such longer period of time as may be required by law. Contractor shall require all of its Subcontractors to likewise retain all of their Project records and supporting documentation. The City, and any duly authorized agents or representatives of the City, shall be provided access to all such records and supporting documentation at any and all times during normal business hours upon request by the City. Contractor shall make all such Project records and supporting documentation available in Bay County, Florida. Further, the City, and any duly authorized agents or representatives of the City, shall have the right to audit, inspect and copy all of Contractor's and any Subcontractor's Project records and documentation as often as they deem necessary and Contractor shall cooperate in any audit, inspection, or copying of the documents. These access, inspection, copying and auditing rights shall survive the termination of this Agreement.

40.0 EQUAL OPPORTUNITY REQUIREMENTS

40.1 For all contracts in excess of \$10,000, the Contractor shall comply with Executive Order 11246, entitled "Equal Employment Opportunity", as amended by Executive Order 11375, and as supplemented in Department of Labor regulations (41 CFR Part 60).

40.2 The Contractor's compliance with Executive Order 11246 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4 and its efforts to meet the goals established for the geographic area where the Agreement is to be performed.

41.0 CHANGED CONDITIONS

41.1 Notwithstanding anything in the Contract Documents to the contrary, if conditions are encountered at the Project site which are (i) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (ii) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, and which reasonably should not have been

discovered by Contractor as part of its scope of site investigative services required pursuant to the terms of the Contract Documents, then Contractor shall provide the City with prompt written notice thereof before conditions are disturbed and in no event later than seven (7) calendar days after first observance of such conditions. the City and Engineer shall promptly investigate such conditions and, if they differ materially and cause an increase or decrease in Contractor's cost of, or time required for, performance of any part of the Work, the City will acknowledge and agree to an equitable adjustment to the Contract Price or Contract Time, or both, for such Work. If the City determines that the conditions at the site are not materially different from those indicated in the Contract Documents or not of an unusual nature or should have been discovered by Contractor as part of its investigative services, and that no change in the terms of the Agreement is justified, the City shall so notify Contractor in writing, stating its reasons. Claims by Contractor in opposition to such determination by the City must be made within seven (7) calendar days after Contractor's receipt of the City's written determination notice. If the City and Contractor cannot agree on an adjustment to the Contract Price or Contract Time, the dispute resolution procedure set forth in the Contract Documents shall be complied with by the parties.

42.0 COMPLIANCE WITH LAWS

42.1 Contractor agrees to comply, at its own expense, with all federal, state and local laws, codes, statutes, ordinances, rules, administrative orders, regulations and requirements applicable to the Project, including but not limited to those dealing with safety (including, but not limited to, the Trench Safety Act, Chapter 553, Florida Statutes). An executed copy of Contractor's Trench Safety Act Certificate of Compliance (the form of which is attached hereto as Section 00096) has been delivered to City with the Contractor's Bid Proposal Form. If Contractor observes that the Contract Documents are at variance therewith, it shall promptly notify the City and Engineer in writing. Contractor has provided a separate line item in its Bid identifying the cost of compliance with the applicable trench safety standards set forth in the Trench Safety Act.

43.0 PUBLIC ENTITY CRIMES

43.1 By its execution of the Agreement and the Contractor's Public Entities Crime Statement, in the form set forth in Section 00097). Contractor acknowledges that it has been informed by the City of and warrants that it is in compliance with the terms of Section 287.133(2)(a) of the Florida Statutes which reads as follows:

"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 for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity in excess of the threshold amount provided in s. 287.017 for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list."

44.0 INSURANCE

- 44.1 During the term of this Agreement, Contractor shall provide, pay for, and maintain, with companies satisfactory to the City, the types and limits of insurance required by the Contract Documents. All insurance shall be from responsible companies eligible to do business in the State of Florida. Simultaneously with the execution and delivery of this Agreement by Contractor, Contractor shall deliver to the City the properly completed and executed Certificate of Insurance, in the form set forth in Section 00099 along with any other properly completed and executed Certificates of Insurance that may be necessary, evidencing the fact that Contractor has acquired and put in place the insurance coverages and limits required herein. In addition, certified, true and exact copies of all insurance policies required shall be provided to the City, on a timely basis, if requested by the City. These Certificates and policies shall contain provisions that at least thirty (30) calendar days advanced written notice by registered or certified mail shall be given the City of any cancellation, intent not to renew, or any policy change that would result in a reduction in the policies' coverages, except in the application of the Aggregate Limits Provisions. The renewal of any insurance required to be maintained by Contractor hereunder shall be by a renewal Certificate of Insurance in the same form as was required for the original Certificate of Insurance, which renewal Certificate of Insurance shall be delivered to City at least ten (10) calendar days prior to expiration of current coverages so that there shall be no interruption in the Work due to lack of proof of insurance coverages required of Contractor under this Agreement.
- 44.2 Contractor shall also notify the City, in the same manner required in Section 44.1 above, within two (2) calendar days after Contractor's receipt, of any notices of expiration, cancellation, non-renewal or material change in coverages or limits received by Contractor from its insurer, and nothing contained herein shall relieve Contractor of this requirement to provide notice. In the event of a reduction in the aggregate limit of any policy to be provided by it hereunder, Contractor shall immediately take steps to have the aggregate limit reinstated to the full extent permitted under such policy. If, at any time, City requests a written statement from an insurance company as to any impairment to any aggregate limit of any policy to be provided by it hereunder, Contractor shall promptly

authorize and cause to be delivered such statement to City. All insurance coverages of Contractor shall be primary to any insurance or self-insurance program carried by the City applicable to this Agreement. Any such self insurance programs or coverages shall not be contributory with any insurance required of the Contractor under the terms of this Agreement. All insurance policies, other than the Workers Compensation policy and the Surveyor's Professional Liability policy, provided by Contractor to meet the requirements of this Agreement shall name the City as an additional insured through the use of ISO Endorsement No. CG 20.10.10.01 and No. CG 20.37.10.01 wording, as to the operations of Contractor under the Contract Documents and shall also provide the Severability of Interest provision (also referred to as the Separation of Insureds provision). Companies issuing the insurance policy or policies shall have no recourse against the City for payment of premiums or assessments for any deductibles which all are at the sole responsibility and risk of Contractor.

- 44.3 All insurance policies to be provided by Contractor pursuant to the terms hereof shall be performable in Bay County, Florida and must expressly state that the insurance company will accept service of process in Bay County, Florida and that the exclusive venue and exclusive jurisdiction for any action concerning any matter under those policies shall be in the appropriate state court situated in Bay County, Florida.
- 44.4 The acceptance by the City of any Certificate of Insurance pursuant to the terms of this Agreement evidencing the insurance coverages and limits required hereunder does not constitute approval or agreement by the City that the insurance requirements have been met or that the insurance policies shown on the Certificates of Insurance are in compliance with the requirements of this Agreement.
- 44.5 Before starting and until completion of all Work required hereunder, Contractor shall procure and maintain insurance of the types and to the limits specified in the Contract Documents. Contractor shall require each of its Subcontractors to procure and maintain, until the completion of that Subcontractor's work or services, insurance of the types and to the limits specified in the Contract Documents, unless such insurance requirement for the Subcontractor is expressly waived or modified in writing by the City. Contractor shall not enter or otherwise occupy the Project site or commence any Work to be performed under this Agreement at the Site or any other property of the City until all insurance required hereunder has been obtained by Contractor and such proof of insurance, as the same is required under this Agreement, has been delivered to City. Contractor shall require all property insurance policies related to the Work and secured and maintained by Contractor and its Subcontractors to include provisions providing that each of their insurance companies shall waive all rights of recovery, under subrogation or otherwise, against the City and any of its separate contractors and the agents, employees and subcontractors of any of

them.

- 44.6 Should at any time Contractor or any of its Subcontractors not maintain the insurance coverages required in this Agreement, the City may terminate this Agreement for Contractor default or at its sole discretion shall be authorized to purchase such coverages and charge Contractor for such coverages purchased, to include a fifteen percent (15%) administrative fee. If Contractor fails to reimburse the City for such costs within thirty (30) calendar days after demand, the City has the right to offset those costs from any amount due Contractor under this Agreement. The City shall be under no obligation to purchase such insurance, nor shall it be responsible for the coverages purchased or the insurance company/companies used. The decision of the City to purchase such insurance coverages shall in no way be construed to be a waiver of any of its rights under this Agreement. If the City exercises its option to purchase such required coverages, the coverages shall not be cancelled by Contractor and shall stay in force until the normal expiration date according to the terms and conditions of the insurance policy.
- 44.7 As may be required by City from time to time, the status of any insurance aggregate limits are to be confirmed in writing by the respective insurance companies. The amounts and types of insurance Contractor shall comply with all of the requirements of this Section 44 unless otherwise agreed to, in writing, by City.

[END OF SECTION 00100]

SECTION 00110

MISCELLANEOUS REQUIREMENTS

1. COORDINATION OF WORK

The Contractor shall submit a construction schedule to the Owner/Owner/Engineer for all work to be accomplished under the contract along with an anticipated schedule of payments he will earn during the course of the construction. Said schedule shall be submitted to the Owner/Owner/Engineer following Contractor's receipt of Notice of Award, but prior to issuance of Notice to Proceed.

2. SUBMITTAL DATA

The Contractor shall be required to submit an electronic PDF file to the Owner/Engineer of pertinent information, shop drawings and literature on all materials and items of equipment to be installed in conjunction with these specifications. Before ordering or installing any of the equipment or materials, the Contractor shall have one copy of submittal data on each item approved by the Owner/Engineer in writing and returned to him.

3. AS-BUILT RECORDS

A complete set of as-built records shall be kept by the Contractor. The as-built plans shall meet the City's Minimum Technical Standards for Utility As-Built (see Drawing Details). These records shall show all items of construction and equipment which differ in size, shape or location from those shown on the contract drawings. All new valve installations shall be referenced to three (3) permanent points. The piping shall be measured from easily identifiable, permanent, existing structures. These records shall be kept up-to-date daily. They may be kept on a marked set of contract drawings for this purpose, or in any other form which is approved prior to the beginning of the work. Record drawings shall include elevations of the new piping every 100 feet and the location of all fittings. In addition, the information provided in the boring log table referenced to the project stationing and indicating the direction of the pull phase in the construction drawings shall also be maintained and provided for all directional drill installations. Record drawings shall be submitted in the format required by the City's Minimum Technical Standards for Utility As-Built (see Drawing Details).

4. OPERATION AND MAINTENANCE MANUALS

The Contractor shall furnish the Owner/Engineer complete, indexed sets of literature in searchable PDF format giving the following information:

- a. Clear and concise instructions for operation, adjustment, and lubrication and other maintenance of the equipment. These instructions shall include a complete lubrication chart.

- b. A list of all parts of the equipment, with catalog numbers and other data necessary for ordering replacement parts.
- c. Such instruction and parts lists shall have been prepared specifically for the model and type of equipment furnished and shall not refer to other models and types of similar equipment.
- d. A complete compendium of all shop drawings submittals for this project in searchable pdf format shall be provided as an appendix to the Operation and Maintenance Manual.

5. INSPECTIONS REQUIRED BY CONTRACTOR

The following is a list of the minimum general items for which the Contractor is to give the Owner/Engineer a minimum of 48 hours notice prior to performing the work:

- 1) Directional drill or bored and jacked piping installation.
- 2) Placement of concrete.
- 3) Any major tie-ins or valve placements prior to backfill.
- 4) Hydrostatic tests of pressure pipework.
- 5) Process operational tests.
- 6) Start-up.
- 7) Final clean-up of sites.

The Contractor shall verify that the hereinbefore mentioned items are ready to be inspected and/or tested prior to notifying the Owner/Engineer. Following notification, the Owner/Engineer will then make the necessary trip to witness the test or inspection. If the inspection is not ready to be made or the required testing fails to meet specifications, then the Contractor shall pay all costs associated with that inspection trip. These costs shall include time spent by the Owner/Engineer and/or inspector and the direct expenses (i.e. mileage, etc.) associated with the failing inspection. Only the test in which the system passes will be included in the general inspection of the job for the Owner.

6. COORDINATION WITH OTHERS

Contractor shall coordinate his work with other contractors that may be working with in

the affected portion of the right of way and neighboring properties performing other work. The Contractor shall make the necessary connections and adjustments as required to complete the Work.

7. SUBSTANTIAL COMPLETION

For the purposes of this contract, the following requirements must be met before any portion of the work is considered to be substantially complete:

1. All work is complete with the exception of minor completion sitework limited to final finish grading and grassing.
2. All testing performed with satisfactory results meeting the specified criteria.
3. All connections and flushing are complete and the lift station and forcemain are in a state of readiness to serve pending release for service by the jurisdictional regulatory agencies.
4. All repair and coating systems have been properly cured.
5. All data specified in the Contract Documents have been delivered to the Owner.
6. All instructions have been provided to the designated Owner's representative(s) in accordance with the Contract Documents.
7. All training has been completed.

END OF SECTION 00110

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1. APPLICATION FOR PAYMENT

The Contractor shall submit an application for payment, no more frequent than monthly, to the Owner/Engineer for review and approval upon partial completion of the project before the Contractor will be compensated for the work performed during that period. The application shall include an updated project schedule and will invoice work completed as detailed in the Contractor's Proposal. The schedule can be submitted as a hard copy with the pay application or as a PDF file. Pay applications will not be approved without approval of the project schedule. Final payment in full will be made when work is completed to the satisfaction of the Owner, and the Owner/Engineer, when it has been shown that the Contractor has discharged all obligations of this Contract (Release of Liens) and when all punch list items have been corrected. Application for payment will be made on the standard AIA form, or type of form approved by the Owner.

END OF SECTION 00120

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SECTION 00800 – SUPPLEMENTARY CONDITIONS

PART 1 - GENERAL

1.1 CLAIM PERIOD

- A. No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this Contract.

1.2 REGULAR WORKING HOURS

- A. Regular working hours are defined as up to forty hours per week with a maximum of ten hours per day, Monday through Friday, beginning no earlier than 7:00 A.M. and ending no later than 5:00 P.M., excluding holidays. Any work beyond ten hours per day or forty hours per week shall be considered overtime. The Contractor shall not work on holidays. The Contract Time shall not be extended due to holidays falling within the Contract Time. Whenever the Contractor is performing any part of the Work, with the exception of equipment maintenance and cleanup, inspection by Owner's representative will be required. Requests to perform the Work at times other than during regular working hours must be submitted in writing to the Project Representative, at least 48 hours prior to any proposed weekend work or scheduled extended workweeks, to give the Owner ample time to arrange for representation and/or inspection during those periods. Periodic unscheduled overtime on weekdays will be permitted provided that two hours notice is provided to and acknowledged in writing by the Project Representative prior to the end of the regular working day. Maintenance of the Contractor's equipment and cleanup may be performed during hours other than regular working hours.
- B. Contractor shall reimburse the Owner for additional engineering and/or inspection costs incurred as a result of overtime work in excess of the regular working hours. At Owner's option, overtime costs may either be deducted from the Contractor's monthly payment request or deducted from the Contractor's retention prior to release of final payment.
- C. Engineering/Inspection costs shall be calculated at the following rates:
 - 1. Field Representative \$95/hour
 - 2. Engineer \$165/hour
 - 3. Project Manager \$210/hour

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1.3 DEFECTIVE WORK

- A. The Contractor shall not be entitled to an extension of the Contract Time or increase in the Contract Price for correcting or removing defective work.

1.4 CORRECTIVE WORK

- A. Where defective or nonconforming Work (including damage to other work resulting therefrom) has been corrected, removed or replaced pursuant to the Contractor's obligations under the Contract Documents including Articles 16.0 and 27.0 of the General Conditions, the correction period set forth in Article 27.0 of the General Conditions 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 and accepted by the Owner.

1.5 STORED EQUIPMENT AND MATERIALS

- A. The Contractor shall furnish evidence that payment received on the basis of materials and equipment, not incorporated and suitably stored, has in fact been paid to the respective supplier(s) within sixty (60) days of the Application of Payment on which the material/equipment first appeared. Failure to procure said evidence of payment shall result in the withdrawal of previous approval(s) and removal of the related equipment and materials from the Application of Payment.

1.6 SUBSTANTIAL COMPLETION

- A. In addition to the other terms and conditions set forth in the Contract Documents, the Work will not be considered substantially complete unless and until Contractor has completed each of the following to the satisfaction of the Owner:
 1. All components of the Work have been installed, tested and approved.
 2. All repair and coating systems have been properly cured.
 3. All data specified in the Contract Documents have been delivered to the Owner.
 4. All instructions have been provided to the Project Representative in accordance with the Contract Documents.
 5. All training to be provided by Contractor pursuant to the terms of the Contract Documents has been completed.

END OF SECTION 00800

SECTION 000808

SALES TAX EXEMPTION ADDENDUM

1. Contractor and City entered into a contract dated _____, (the "Contract") for the performance of the WORK described therein, to which an executed copy of this Sales Tax Exemption Addendum ("Addendum") shall be attached thereto and incorporated therein.
2. Contractor and City desire to enter into an arrangement whereby certain purchases under the Contract can be made through the City as a means of taking advantage of the City's status of being exempt from sales and use taxes.
3. The City is exempt from sales and use taxes. As such it is exempt from the payment of sales and use tax on purchases of building materials or equipment necessary for the performance of work under construction contracts, provided the City determines it is to its best interest to do so, and provided the purchase of such building materials and equipment are handled in the manner hereinafter described.
4. The City has determined it is in its best interest to provide the opportunity to eliminate the payments of sales tax for building materials or equipment to be used in the construction of this project, and notifies the Contractor of its intent to do so.

TERMS AND CONDITIONS

1. The parties intend by this Addendum to comply with the procedures and elements described in Florida Department of Revenue Technical Assistance Advisements 01A-003 (January 8, 2001) and 00A-083 (December 21, 2000), and any conflict or ambiguity in this Addendum shall be resolved in favor of meeting the elements necessary to make tax exempt the purchases contemplated by this Addendum.
2. The City shall, at its sole discretion, have the option to purchase directly from the supplier or vendor, any building materials or equipment included in the Contractor's bid for the Contract. Contractor shall, from time to time submit, update and keep current, for consideration by the City, a list of all building materials and equipment to be purchased, organized by supplier or vendor. Such list shall include a brief description of the building materials and equipment and the name and address of the supplier or vendor. Suppliers or vendors reasonably anticipated to furnish building materials and equipment with an aggregate purchase value of less than \$10,000 need not be listed. Contractor's initial list is attached hereto and incorporated herein. Building materials and equipment not required for the performance of the Contract shall not be purchased under this Addendum. The City reserves the right to delete or add items from this Addendum when it is in the City's best interest.

3. The City will be liable for the payment of all purchases properly made hereunder.
4. Contractor shall notify all suppliers or vendors not to make sales to the Contractor under this Addendum.
5. For each purchase approved by the City to be made under this Addendum, the Contractor shall furnish the City in writing information sufficient for the City to issue to the supplier its City purchase order for the requested building materials or equipment which shall include as an attachment the City's Certificate of Exemption. Suppliers and vendors will render statements for materials purchased to the City in care of the Contractor. After receiving and inspecting the materials when they arrive at the job site, verifying that all necessary documentation accompanies the delivery and conforms with the purchase order, Contractor will forward the invoices to the City's duly authorized representative for approval, processing and delivery to the City for payment. The City will process the invoices and issue payment directly to the supplier or vendor. Contractor will keep and furnish to the City all such records, summaries, reports of purchase orders and invoices, and reports of the status and use of goods handled under this Addendum, as the City may reasonably require.
6. The Contract provides that Contractor will perform the work under the Contract for the Contract Price in the amount of \$527,069.00, as may be amended from time to time as provided in the Contract. Said amount, as amended, due Contractor under the Contract shall be reduced by the sum of all amounts paid by the City for materials and equipment purchased under this Addendum, including any shipping, handling, insurance or other, similar charges paid by the City, and all of the savings of sales and use tax on the purchase of such items.
7. The Contractor shall submit his proposal for base bid and proposals for each Alternate with the inclusion of all required taxes including applicable sales and use tax, the same as if tax were to be paid in the normal manner. Any sales and use tax savings will be effected during the performance of the Contract.
8. Contractor shall immediately notify all subcontractors and material and equipment suppliers of the City's intent to reduce the construction cost of the Project by the purchase of building materials and equipment in the manner herein described and the Contractor shall not withhold his consent to the arrangement.
9. Administrative costs incurred by the Contractor with this Addendum shall be considered to be included in the Total Lump Sum Bid amount for the Work. No addition shall be added to the Contract Price because of the service provided by the Contractor in the purchase of building materials and equipment by the City.
10. All sales and use tax savings on the purchase of building materials and equipment shall be credited to the City and the amount of the Contract Price shall be reduced by the full amount of savings which result from the omission of payment of sales and use tax.

11. By virtue of its payment of material and equipment invoices, the City further intends to benefit from any discounts offered for timely payment to the extent of one-half of the discount offered, the remaining one-half to accrue to the Contractor as an incentive for the Contractor to process invoices well within the discount period. The Contractor shall pay any late penalties caused by its failure to facilitate the processing of invoices within the allotted time.
12. The Contractor, notwithstanding the terms and conditions of this Addendum, shall select, describe, obtain approvals, submit samples, coordinate, process, prepare shop drawings, pursue, receive, inspect, store, protect and guarantee the same as would have been the case if the tax saving procedures were not implemented.
13. The Contractor as bailee shall have the obligation of receiving, inspecting, storing and safekeeping all goods and materials purchased on behalf of the City pursuant to this Addendum. Further, the Contractor shall be responsible for the cost of replacing or repairing any goods or materials lost, stolen, damaged or destroyed while in the Contractor's possession or control as bailee, as well as processing all warranty claims for defective goods and materials to the same extent as if such goods had been Contractor-supplied or purchased in the name of the Contractor.
14. Contractor shall maintain separate accounting records for all transactions carried out under the authority granted to it under this Addendum. Such records shall be open to the City or its authorized agent during normal business hours of Contractor.
15. The City will take both legal and equitable title to the building materials and equipment received from the vendor when delivery is made by the vendor at the Project site. Without waiving or releasing Contractor from its obligations under paragraph 13 above, as equitable and legal owner of the materials and equipment purchased under this Addendum, the City shall bear the risk of loss thereto and shall have the insurable interest therein. Therefore, unless already provided for under the terms of the Contract Documents, Contractor shall cause the City to be insured or named as an additional insured as its interest may appear against any loss or damage to such goods to the extent of their full insurable value. All such insurance shall be in such form and through such companies as may be reasonably acceptable to City and Contractor shall provide City certificates thereof requiring each insurer to provide the City ten (10) days written notice in advance of cancellation or modification of coverage. Pursuant to the terms of the Contract Documents, the City will reimburse the Contractor for any additional premium amounts paid solely for such insurances against loss or damage.
16. Contractor shall be fully responsible for all matters relating to the procurement of materials and equipment covered by this Addendum, including but not limited to, overseeing that the correct materials and the correct amounts are received timely with appropriate warranties; for inspecting and receiving the goods; and for unloading, handling and storing the materials until installed. Contractor shall

inspect the materials when they arrive at the Project site, verify that all necessary documentation accompanies the delivery and conforms with the City's purchase order, and forward the invoice to the City for payment if the goods are conforming and acceptable. Contractor shall verify that the materials conform to Drawings and Specifications and determine before installation that such materials are not defective. Contractor shall manage and enforce the warranties on all materials and equipment covered by this Addendum. Contractor shall be responsible to the City for its failure to fully and timely perform its obligations under this paragraph, and this Addendum generally.

17. When title to the materials and equipment covered by this Addendum passes to the City prior to being incorporated into the Work, the Contractor's possession of the goods is a bailment until such time as each of such goods is returned to the City by being incorporated into the Work.
18. The City shall not be liable for delays in the Work caused by delays in delivery of or defects in the goods covered by this Addendum, nor shall such delays or defects excuse Contractor in whole or in part from its obligation to timely perform the Contract.
19. In the event Contractor objects to the payment of any invoice for goods covered by this Addendum, Contractor shall at no additional cost to the City, provide all assistance, records and testimony necessary or convenient for the City to resolve the supplier's claim for payment.
20. This Addendum and the authority granted to Contractor hereunder may be revoked by the City at any time upon verbal or written notice to Contractor at its offices located at _____ during normal business hours.

[END OF SECTION 00808]

SECTION 01046 - SPECIAL PROVISIONS

PART 1 – GENERAL

1.1 CONSTRUCTION AREAS

- A. The Contractor shall limit his use of the construction areas for work and for storage to allow for:
 - 1. Work by other contractors.
 - 2. Owner use.
 - 3. Public use.
- B. Coordinate use of work site under direction of Engineer.
- C. Assume full responsibility for the protection and safekeeping of materials and products under this Contract, stored on the site.
- D. Move any stored products, under Contractor's control, which interfere with operations of the Owner or separate contractor.
- E. Obtain and pay for the use of additional storage of work areas needed for operations.

1.2 OWNER OCCUPANCY

It is assumed that portions of the work will be completed prior to completion of the entire work. The Owner, at its sole discretion, may begin operation of the individual facility. However, the one-year guaranty period shall commence on the date of substantial completion issued by the Engineer.

1.3 SPECIFICATIONS

A. Specifications

The Technical Specifications consist of three parts: General, Products and Execution. The General Section contains General Requirements which govern the work. Products and Execution modify and supplement these by detailed requirements of the work and shall always govern whenever there appears to be a conflict.

B. Intent

All work called for in the Specifications applicable to this Contract, but not shown on the plans in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the plans or the Specifications, but involved in carrying out their intent or in the complete and proper execution of the work is required and shall be performed by the Contractor as though it were specifically delineated or described.

The apparent silence of the specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these specifications shall be made upon that basis. The inclusion of the General Requirements (or work specified elsewhere) in the General part of the specifications is only for the convenience of the Contractor, and shall not be interpreted as a complete list of related Specification Sections.

1.4 WORK PROGRESS

The CONTRACTOR shall construct the work as shown on the drawings and provide equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such project appears to the ENGINEER to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he/she may request the CONTRACTOR to increase the efficiency, change the character or increase the project equipment and the CONTRACTOR shall conform to such request. Failure of the ENGINEER to give such request shall in no way relieve the CONTRACTOR of his/her obligations to secure the quality of the work and rate of progress required.

1.5 PRIVATE LAND

The CONTRACTOR shall not enter or occupy private land outside of the plant site or easements, except by notarized permission of the land owner.

1.6 WORK LOCATIONS

Structures and pipelines shall be located substantially as indicated on the Drawings, but the ENGINEER reserves the right to make such modifications in

locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings are noted on the Drawings, such notation is for the CONTRACTOR's convenience and does not relieve him/her from laying and jointing different or additional items where required.

1.7 OPEN EXCAVATIONS

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons and damage to property. The CONTRACTOR shall at his/her own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions. The ENGINEER may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street and requiring that the trench shall not remain open overnight.
- B. The CONTRACTOR shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
- C. The Contractor shall adhere to the requirements of the Florida Trench Safety Act, and O.S.H.A. Excavation Safety Standards 29 CFRs 1926.650 Subpart P.

1.8 TEST PITS

Test pits for the purpose of locating all known and unknown underground pipeline or structures in advance of the construction shall be excavated and backfilled by the CONTRACTOR at the direction of the ENGINEER. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the ENGINEER. No separate payment will be made.

1.9 CARE AND PROTECTION OF PROPERTY

- A. The CONTRACTOR shall be responsible for the preservation of all public and private property and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the CONTRACTOR, such property shall be restored by the CONTRACTOR,

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at his/her expense, to a condition similar or equal to that existing before the damage was done, or he/she shall make good the damage in other manner acceptable to the ENGINEER.

- B. All sidewalks, mailboxes, and driveways which are disturbed by the CONTRACTOR's operations shall be restored to their original construction or better and in accordance with the best modern practice.
- C. Along the location of this work all fences, walks, bushes, trees, shrubbery, and other physical features shall be protected and restored in a thoroughly workmanlike manner. Fences and other features removed by the CONTRACTOR shall be replaced in the location indicated by the ENGINEER as soon a conditions permit. All grass areas beyond the limits of construction which have been damaged by the CONTRACTOR shall be regraded and seeded.
- D. Trees close to the work shall be boxed or otherwise protected against injury. The CONTRACTOR shall trim all branches that are liable to damage because of his operations, but in no case shall any tree be cut or removed without prior notification of the City. All injuries to bark, trunk, limbs, and roots of trees shall be repaired by dressing, cutting, and painting according to approved methods, using only approved tools and materials. All landscaping to be removed shall be documented and replaced with like kind or better. All palm trees shown on plans shall be spaded out, protected, temporarily stored, and replaced at the same location.
- E. The protection, removal, and replacement of existing physical features along the line of work shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the unit and/or lump sum prices established under the items in the Schedule of Prices.

1.10 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

- A. The CONTRACTOR shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, storm drains and electric and telephone cables, whether or not they are shown on the Drawings. The CONTRACTOR shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the CONTRACTOR's operations shall be repaired by him/her at his/her expense.
- B. The CONTRACTOR, however, shall bear full responsibility for obtaining

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all locations of underground structures and utilities (including existing water services, drain lines and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by the CONTRACTOR.

- C. Protection and temporary removal and replacement of existing utilities and structures as described in this Section shall be a part of the work under the Contract and all costs in connection therewith shall be included in the Total Price Bid in the Bid Form.
- D. The Contractor shall be responsible to maintain water, telephone, power, cable TV, sewer, gas and other related utilities throughout construction at no additional cost to the Owner.
- E. The Contractor shall fully cooperate with all private and public utilities during the installation of new facilities, or relocation of existing facilities. The Contractor shall coordinate his work accordingly and shall have no claim except for time extension for delays associated with the proposed utility improvements.

1.11 WATER FOR CONSTRUCTION PURPOSES

- A. In locations where public water supply is available, the CONTRACTOR may purchase water for construction purposes.
- B. The express approval of the OWNER shall be obtained before water is used. Waste of water by the CONTRACTOR shall be sufficient cause for withdrawing the privilege of unrestricted use. Hydrants shall only be operated under the supervision of the OWNER's personnel.
- C. All water drawn from a public water supply shall be metered using a meter supplied by the OWNER.

1.12 MAINTENANCE OF FLOW

The CONTRACTOR shall at his/her own cost, provide for the flow of sewers, drains and water courses interrupted during the progress of the work, and shall immediately cart away and remove all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the ENGINEER well in advance of the interruption of any flow.

1.13 COOPERATION WITHIN THIS CONTRACT

- A. All firms or persons authorized to perform any work under this Contract shall cooperate with the CONTRACTOR and his/her Subcontractors or

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trades and shall assist in incorporating the work of other trades where necessary or required.

- B. Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or approved by the ENGINEER.

1.14 CLEANUP AND DISPOSAL OF EXCESS MATERIAL

- A. During the course of the work, the CONTRACTOR shall keep the site of his/her operations in as clean and neat a condition as is possible. He/She shall dispose of all residue resulting from the construction work and, at the conclusion of the work, he/she shall remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures and any other refuse remaining from the construction operations and shall leave the entire site of the work in a neat and orderly condition.
- B. In order to prevent environmental pollution arising from the construction activities related to the performance of this Contract, the CONTRACTOR and his/her subcontractors shall comply with all applicable Federal, State and local laws and regulations concerning waste material disposal, as well as the specific requirements stated in this Section and elsewhere in the Specifications.
- C. The CONTRACTOR is advised that the disposal of excess excavated material in wetlands, stream corridors and plains is strictly prohibited even if the permission of the property owner is obtained. Any violation of this restriction by the CONTRACTOR or any person employed by him, will be brought to the immediate attention of the responsible regulatory agencies, with a request that appropriate action be taken against the offending parties. Therefore, the CONTRACTOR will be required to remove the fill at his/her own expense and restore the area impacted.

1.15 MAINTENANCE OF ACCESS

Portions of the work are located in developed areas requiring the access for fire and other departments to be provided for and at least one free lane be available for all traffic. CONTRACTOR's are to arrange operations in these areas to meet these requirements and secure approval or operating procedures from City of Panama City Beach, or Florida Department of Transportation as the case may be.

1.16 MAINTENANCE OF TRAFFIC

- A. Open pits, trenches, unpaved streets, debris, or other obstructions due to

construction that will prevent the normal flow of traffic during an extended construction stoppage, for any reason, shall be minimized. In the event an extended construction stoppage is found to be necessary, CONTRACTOR shall, at his own expense, provide normal traffic flow during extended construction stoppage.

- B. All excavated material shall be placed so that vehicular and pedestrian traffic may be maintained at all times. If the CONTRACTOR's operations cause traffic hazards, he shall repair the road surface, provide temporary roadways, erect wheel guards or fences, or take other measures for safety satisfactory to the ENGINEER.
- C. Detours around construction areas will be subject to the approval of the OWNER. Where detours are permitted the CONTRACTOR shall provide all necessary barricades and signs as required to divert the flow of traffic. While traffic is detoured the CONTRACTOR shall expedite construction operations and the OWNER will strictly control periods when traffic is being detoured.

1.17 CONNECTION TO WORK BY OTHERS

- A. If construction by others occurs at the same time and in the same areas as work being done under this Contract. The CONTRACTOR will then conduct his operations as follows:
 - 1. Force Mains and Water Mains
 - a. If shown on the Drawings, pipelines constructed under this Contract may be connected to pipelines to be built by others.
 - b. Pipelines built under this Contract will be connected to pipelines constructed by others by removing the plugs at both ends of the pipeline segment and making the connection.
 - c. If the pipelines have not been constructed by others, the pipeline under this Contract shall be laid to the required line and grade, terminated with a plugged connection, precisely at the location of the connection indicated on the Drawings, and then backfilled and marked with a stake and the connection made later as specified in (b) above.

1.18 PROTECTION OF CONSTRUCTION AND EQUIPMENT

- A. All newly constructed work shall be carefully protected from injury in any way. No wheeling or walking or placing of heavy loads on it shall be allowed and all portions injured shall be reconstructed by the CONTRACTOR at his own expense.

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- B. All structures shall be protected in a manner approved by the ENGINEER. If, in the final inspection of the work, any defects, faults or omissions are found, the CONTRACTOR shall cause the same to be repaired or removed and replaced by proper materials and workmanship without extra compensation for the materials and labor required. Further, the CONTRACTOR shall be fully responsible for the satisfactory maintenance and repair of the construction and other work undertaken herein, for at least the guarantee period described in the contract.
- C. The CONTRACTOR shall take all necessary precautions to prevent damage to any structure due to water pressure during and after construction and until such structure is accepted and taken over by the OWNER.
- D. The CONTRACTOR shall maintain the work during construction and until the project is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces to the end that the road or structures are kept in satisfactory condition at all times. In the case of a Contract for the placing of a course or subgrade previously constructed, the CONTRACTOR shall maintain the previous course or subgrade during all construction operations.

All cost of maintenance work during construction and before the project is accepted shall be included in the unit prices bid on the various pay items and the CONTRACTOR will not be paid an additional amount for such work.

PART 2 – PRODUCTS
(Not Applicable)

PART 3 – EXECUTION
(Not Applicable)

END OF SECTION 01046

SECTION 01050 - FIELD ENGINEERING AND SURVEYING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. The Contractor shall provide field engineering and surveying services required for the project.
- B. The Contractor shall furnish and set all necessary stakes to establish the lines and grades as shown on the Contract Drawings, and layout each portion of the work of his contract. The Contractor shall provide all civil, structural or other professional engineering services specified or required to execute Contractor's construction methods.
- C. All costs of construction layout and field engineering shall be included in the unit prices and lump sum amounts contained in the contract.

1.2 QUALIFICATIONS OF SURVEYOR

All construction staking shall be conducted by or under the supervision of a Florida registered professional land surveyor approved by the Owner and Engineer. The Contractor shall be responsible for the layout of all such lines and grades.

1.3 SURVEY REFERENCE POINTS

- A. Existing basic horizontal and vertical control points for the Project are designated on the Contract Drawings.
- B. The Contractor shall locate and protect control points prior to starting work, and preserve all permanent reference points during construction.
 - 1. Make no changes or relocations without prior written notice to 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. The Contractor shall replace all Project control points which may be lost or destroyed at his cost. Replaced control points shall be based on original survey control.

1.4 PROJECT SURVEY REQUIREMENTS

The Contractor shall establish temporary bench marks as needed from survey control points provided.

1.5 RECORDS

Maintain a complete, accurate log of all control and survey work as it progresses.

1.6 SUBMITTALS

- A. Submit name and address of registered surveyor to Engineer for approval.
- B. Show any changes or discrepancies on the as-built drawings and submit to Engineer at substantial completion of project.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.1 CONSTRUCTION SURVEYING AND SURVEY MONUMENTATION

A. LINES, GRADES AND CONSTRUCTION SURVEYING

- 1. The Contractor shall lay out the work from the bench marks, grades, dimensions, points and lines noted on the working drawings, established at the site, or supplied by the Engineer. All work of every description shall be laid out and checked by the Contractor who will be held solely responsible for its correctness, and all expenses in connection with this work shall be paid for by the Contractor.
- 2. The survey work may be checked by the Engineer but remains the sole responsibility of the Contractor.
- 3. No special compensation will be made to the Contractor to defray costs of any work or delays occasioned by making surveys and measurements, tests or inspections, but such costs shall be considered as having been included in the price stipulated for other items of the work to be done under contract.
- 4. In addition, all survey monuments and bench marks which may be disturbed during construction shall be referenced and replaced by the Contractor. All monuments and bench marks disturbed or destroyed

by the Contractor or any of his forces through accident or negligence shall be replaced by a Florida Licensed Professional Land Surveyor at the Contractor's expense.

5. The Contractor shall cross-section existing ditches and swales where the construction will affect these drainage systems. This information shall be used by the Contractor when reconstructing the ditches and swales.

B. PROTECTION AND RESTORATION OF PROPERTY MARKERS AND SURVEY MONUMENTS

1. The Contractor shall be responsible for the preservation of all public and private property markers and shall protect carefully from disturbance or damage all survey monuments and property markers until their locations are witnessed or otherwise referenced by his licensed Florida Professional Land Surveyor, so the said surveyor can restore them in their original location after construction.

END OF SECTION 01050

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SECTION 01065 - PERMITS AND FEES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The CONTRACTOR shall: Obtain and pay for any and all permits and licenses as provided for in the General Conditions, except as otherwise provided herein, and in effect at the time of bidding.
- B. Schedule all inspections and obtain all written approvals of the agencies required by the permits and licenses.
- C. Comply with all construction related conditions specified in each of the permits and licenses.
- D. A copy of the permits obtained by the OWNER will be furnished to CONTRACTOR.

1.2 PERMITS BY OWNER

- A. The OWNER will acquire the following permits when applicable:
 - 1. Bay County right of way use permit (if applicable).

1.3 CONSTRUCTION PERMIT

- A. CONTRACTOR shall be responsible for acquiring all construction permits including local building permits, FDEP generic dewatering discharge permit (FAC 62-621.300.2A) if required, NFWMD dewatering plan and NPDES stormwater discharge from construction site as required.
- B. The dewatering plan shall include sequence of excavation, discharge locations, sediment sump, turbidity control, erosion control, and turbidity monitoring points.

PART 2 - PRODUCTS
(Not Applicable)

PART 3 - EXECUTION
(Not Applicable)

END OF SECTION 01065

SECTION 01090 - DEFINITIONS AND STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 DEFINITIONS

- A. General Explanation: A substantial amount of specification language constitutes definitions for terms found in other contract documents, including drawings which must be recognized as diagrammatic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in contract documents are defined generally in this article.
- B. General Requirements: The provisions or requirements of Division-1 sections. General Requirements apply to entire work of Contract and, where so indicated, to other elements which are included in project.
- C. Indicated: The term "Indicated" is a cross-reference to graphics, notes or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled" and "specified" are used in lieu of "indicated", it is for the purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.
- D. Directed, Requested, etc: Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by Engineer", "requested by Engineer", etc. However, no such implied meaning will be interpreted to extend Engineer's responsibility into Contractor's area of construction supervision.
- E. Approve: Where used in conjunction with Engineer's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" will be held to limitations of Engineer's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "approval" by Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of contract documents.

- F. Project Site: The space available to Contractor for performance of the work, either exclusively or in conjunction with others performing other work as part of the project. The extent of the project site is shown on the drawings, and may or may not be identical with description of land upon which project is to be built.
- G. Furnish: Except as otherwise defined in greater detail, the term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- H. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing protecting, cleaning and similar operations, as applicable in each instance.
- I. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
- J. Installer: The entity (person or firm) engaged by Contractor or its subcontractor or sub-subcontractor for performance of a particular unit of work at project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (Installers) be expert in operations they are engaged to perform.
- K. Testing Laboratory: An independent entity engaged to perform specific inspections or tests of work, either at project site or elsewhere; and to report (if required) interpret results of those inspections or tests.

1.3 SPECIFICATION EXPLANATIONS

- A. Specification Content: Because of methods by which this project specification has been produced, certain general characteristics of content, and conventions in use of language or explained as follows:
 - 1. Specifying Methods: The techniques or methods of specifying to record requirements varies throughout text, and may include "prescriptive", "open generic-descriptive", or a combination of these. The method used for specifying one unit of work has no bearing on requirements for another unit of work.
 - 2. Overlapping and Conflicting Requirements: Where compliance with 2 or more industry standards or sets or requirements is specified, and overlapping of those different standards or requirements establishes

different or conflicting minimums or levels of quality, most stringent requirement (which is generally recognized to be more costly) is intended and will be enforced, unless specifically detailed language written into contract documents (not by way of reference to an industry standard) clearly indicates that a less stringent requirement is to be fulfilled. Refer apparently-equal-but-different requirements, and uncertainties as to which level of quality is the more stringent, to Engineer for a decision before proceeding.

3. Contractor's Options: Except for overlapping or conflicting requirements, where more than one set of requirements are specified for a particular unit of work, option is intended to be Contractor's regardless of whether specifically indicated as such.
4. Minimum Quality/Quantity: In every instance, quality level or quantity shown or specified is intended as minimum for the work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable limits. In complying with requirements, indicated numeric values are either minimums or maximums as noted or as appropriate for context of requirements. Refer instances of uncertainty to Engineer for decision before proceeding.
5. Specialists, Assignments: In certain instances, specification text requires (or at least implies) that specific work be assigned to specialists or expert entities, who must be engaged for performance of those units of work. These must be recognized as special requirements over which Contractor has no choice or option. These assignments must not be confused with (and are not intended to interfere with) normal application of regulations, union jurisdictions and similar conventions. One purpose of such assignments is to establish which party or entity involved in a specific unit of work is recognized as "expert" for indicated construction processes or operations.

Nevertheless, final responsibility for fulfillment of entire set of requirements remains with Contractor.

6. Trades: Except as otherwise indicated, the use of titles such as "carpentry" in specification text, implies neither that the work must be performed by an accredited or unionized tradesperson of corresponding generic name (such as "carpenter"), nor that specified requirements apply exclusively to work by tradesperson of that corresponding generic name.

7. Abbreviations: The language of specifications and other contract documents is of the abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual work abbreviations of a self-explanatory nature have been included in texts. Specific abbreviations have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of terminology and primarily in conjunction with coordination of specification requirements with notations on drawings and in schedules. These are frequently defined in section at first instance of use. Trade association names and titles of general standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of the contract documents so indicates.

1.4 INDUSTRY STANDARDS

- A. General Applicability of Standards: Applicable standards of construction industry have same force and effect (and are made a part of contract documents by reference) as if copied directly into contract documents, or as if published copies were bound herewith.
- B. Referenced standards (referenced directly in contract documents or by governing regulations) have precedence over non-referenced standards which are recognized in industry for applicability to work.
- C. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of contract documents.
- D. Copies of Standards: Provide where needed for proper performance of the work, obtain directly from publication sources.
- E. Abbreviations and Names: Where acronyms or abbreviations are used in specifications or other contract documents they are defined to mean the industry recognized name of trade association, standards generating organization, governing authority or other entity applicable to context of text provision. Refer to "Encyclopedia of Associations", published by Gale Research Co., available in large libraries.

1.5 SUBMITTALS

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- A. Permits, Licenses and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgements, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

PART 2 - PRODUCTS
(Not Applicable)

PART 3 - EXECUTION
(Not Applicable)

END OF SECTION 01090

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SECTION 01095 - REFERENCE STANDARDS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Abbreviations and acronyms used in Contract Documents to identify reference standards.

1.2 QUALITY ASSURANCE

- A. Application: When a standard is specified by reference, comply with requirements and recommendations stated in that standard, except when requirements are modified by the Contract Documents, or applicable codes establish stricter standards.
- B. Publication Date: The publication in effect on the date of issue of Contract Documents, except when a specific publication date is specified.

1.3 ABBREVIATIONS, NAMES, AND ADDRESSES OF ORGANIZATIONS

- A. Obtain copies of referenced standards direct from publication source, when needed for proper performance of Work, or when required for submittal by Contract Documents.

AA Aluminum Association
818 Connecticut Avenue, N.W.
Washington, DC 20006

AASHTO American Association of State Highway
and Transportation Officials
444 North Capitol Street, N.W.
Washington, DC 20001

ACI American Concrete Institute
Box 19150
Redford Station
Detroit, MI 48219

AI Asphalt Institute
Asphalt Institute Building
College Park, MD 20740

AISC American Institute of Steel Construction
1221 Avenue of the Americas
New York, NY 10020

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AISI	American Iron and Steel Institute 1000 16th Street, N.W. Washington, DC 20036
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWWA	American Water Works Association 6666 W. Quincy Avenue Denver, CO 80235
AWS	American Welding Society 2501 NW 7th Street Miami, FL 33125
CRSI	Concrete Reinforcing Steel Institute 180 North LaSalle Street, Suite 2110 Chicago, IL 60601
FS	Federal Specification General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Bldg. 197 Washington, DC 20407
NEC	National Electric Code Battery March Park Quincy, MA 02269-9990
NEMA	National Electrical Manufacturer's Association 2101 L Street, N.W. Washington, DC 20037
NSF	National Sanitation Foundation 3475 Plymouth Road P.O. Box 1468 Ann Arbor, MI 48104

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OSHA	Occupational Safety and Health Administration 5807 Breckenridge Parkway Tampa, FL 33610
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 20076
PCI	Prestressed Concrete Institute 20 North Wacker Drive Chicago, IL 60606
SSPC	Steel Structures Painting Council Pittsburgh, Pennsylvania
UL	Underwriters' Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062

PART 2 - PRODUCTS
(Not Applicable)

PART 3 - EXECUTION
(Not Applicable)

END OF SECTION 01095

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SECTION 01100 - SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.1 WORKMANSHIP, MATERIAL AND EQUIPMENT

- A. When a particular product is specified or called for, it is intended and shall be understood that the proposal tendered by the CONTRACTOR included those products in his bid. Should the CONTRACTOR desire to submit products considered equal to those specified, the CONTRACTOR shall furnish information as described in the General Conditions and Section 01300. The alternate product or products submitted by the CONTRACTOR shall meet the requirements of the specifications and shall, in all respects, be equal to the products specified by name herein.
- B. All apparatus, mechanism, equipment, machinery and manufactured articles for incorporation into the Work shall be the new and unused standard products of recognized reputable MANUFACTURERS.
- C. CONTRACTOR must provide for disposal of excess excavated material.

1.2 SERVICES OF MANUFACTURERS' FIELD SERVICE TECHNICIAN
Refer to Section 11100 of these Specifications

1.3 RESPONSIBILITY OF CONTRACTOR

- A. The CONTRACTOR shall be responsible for the entire Work determined by the Drawings, Specifications and Contract from the date of the starting of the Work until it is accepted as evidence of approval of the Completion Certificate by the OWNER. He shall be responsible for removals, renewals and replacements due to action of the elements and all other causes except as otherwise provided in the Specifications. The CONTRACTOR shall keep the Contract under his own control and it shall be his responsibility to see that the Work is properly supervised and carried on faithfully and efficiently. The CONTRACTOR shall supervise the work personally or shall have a competent, English speaking superintendent or representative, who shall be on the site of the project at all working hours, and who shall be clothed with full authority by the CONTRACTOR to direct the performance of the work and make arrangement for all necessary materials, equipment and labor without delay.
- B. Renewals or repairs necessitated because of defective materials or workmanship, or due to action of the elements or other natural causes, including fire and flood, prior to the acceptance as determined by the Completion Certificate, shall be done anew in accordance with the

Contract and Specifications at the expense of the CONTRACTOR.

1.4 PROVISIONS FOR CONTROL OF EROSION

- A. Sufficient precautions shall be taken during construction to minimize the run-off of polluting substances such as silt, clay, fuels, oils, bitumens, calcium chloride, or other polluting materials harmful to humans, fish, or other life, into the supplies and surface waters of the state. Control measures must be adequate to assure that turbidity in the receiving water will not be increased more than 10 nephelometric turbidity units (NTU), or as otherwise required by the state or other controlling body, in water used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity must not exceed 25 NTU unless otherwise permitted. Special precautions shall be taken in the use of construction equipment to prevent operations which promote erosion.

Erosion evident within the limits of construction shall be the responsibility of the CONTRACTOR during the full term of the contract and for the full (1) year guarantee period. Areas subject to erosion during this time shall be fully restored to original or design conditions (as applicable) within 10 days of notice to the CONTRACTOR.

1.5 HURRICANE PREPAREDNESS PLAN

- A. Within 20 days of the date of Notice to Proceed, the CONTRACTOR shall submit to the ENGINEER and OWNER a Hurricane Preparedness Plan. The plan should outline the necessary measures which the CONTRACTOR proposes to perform at no additional cost to the OWNER in case of a hurricane warning. Such measures shall be in accordance with local and state requirements.
- B. In the event of inclement weather, CONTRACTOR will, and will cause Subcontractors to protect carefully the Work and materials against damage or injury from the weather. If, in the opinion of ENGINEER, any portion of Work or materials shall have been damaged or injured by reason of failure on the part of the CONTRACTOR or Subcontractors to so protect the Work, such Work and materials shall be removed and replaced at the expense of CONTRACTOR.

1.6 WARRANTIES

- A. Unless specified otherwise in the Contract Documents, all equipment supplied under these Specifications shall be warranted by the CONTRACTOR and the equipment MANUFACTURERS for a period of one (1) year. Warranty period shall commence on the date of Initiation of Operation by the OWNER.

- B. The equipment shall be warranted to be free from defects in workmanship, design and materials.
- C. The MANUFACTURER's warranty period shall run concurrently with the CONTRACTOR's warranty or guarantee period. No exception to this provision shall be allowed. The CONTRACTOR shall be responsible for obtaining equipment warranties from each of the respective supplier or MANUFACTURERS for all the equipment specified. The form of warranty is included at the end of this section.
- D. In the event that the MANUFACTURER is unwilling to provide a one-year warranty commencing at the time of OWNER acceptance, the CONTRACTOR shall obtain from the MANUFACTURER a two (2) year warranty starting at the time of equipment delivery to the job site. This two-year warranty shall not relieve the CONTRACTOR of the one-year warranty starting at the time of OWNER acceptance of the equipment.

1.7 UTILITY CROSSINGS

- A. It is intended that wherever existing utilities such as water, chemical, electrical or other service lines must be crossed, deflection of the pressure pipe within recommended limits and cover shall be used to satisfactorily clear the obstruction unless otherwise indicated on the Drawings. However, when in the opinion of the OWNER or ENGINEER this procedure is not feasible he/she may approve the use of fittings for a utility crossing as detailed on the Drawings.

1.8 CONSTRUCTION CONDITIONS AND SUBSURFACE INVESTIGATION

- A. The CONTRACTOR shall strictly adhere to the specific requirements of the governmental unit(s) or agency(ies) having jurisdiction over the work. Wherever there is a difference in the requirements of a jurisdictional body and these Specifications, the more stringent shall apply.
- B. The CONTRACTOR shall be responsible for having determined to his satisfaction, prior to the submission of his bid, the nature and location of the work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the nature of the groundwater conditions, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions and all other matters which can in any way affect the work under this contract. The prices established for the work to be done will reflect all costs pertaining to the work. Any claims for extras based on substrata, groundwater table, and other such conditions will not be allowed.

1.9 PUBLIC NUISANCE

- A. The CONTRACTOR shall not create a public nuisance including but not limited to encroachment on adjacent lands, flooding of adjacent lands, excessive noise, or odor.
- B. Sound levels measured by the OWNER shall not exceed 55 dBA from 8:00 PM to 7:00 AM or 65 dBA from 7:00 AM to 8:00 PM. This sound level to be measured at the Owner's property line. Levels at the equipment shall not exceed 95 dBA at the equipment at any time. Sound levels in excess of these values are sufficient cause to have the work halted until equipment can be quieted to these levels. Work stoppage by the OWNER excessive noise shall not relieve the CONTRACTOR of the other portions of this specification including, but not limited to contract time and contract price.
- C. No extra charge may be made for time lost due to work stoppage resulting from the creation of a public nuisance.

1.10 SUSPENSION OF WORK DUE TO WEATHER

- A. During inclement weather, all work which might be damaged or rendered inferior by such weather conditions shall be suspended. During suspension of the work from any cause, the work shall be suitably covered and protected so as to preserve it from injury by the weather. Refer to Supplemental Conditions for additional requirements.

1.11 RELOCATIONS

- A. The CONTRACTOR shall be responsible for the relocation of structures, including but not limited to light poles, signs, sign poles, fences, piping, conduits, palm trees annotated on plans, and drains that interfere with the positioning of the work as set out on the Drawings. The cost of all such relocations shall be included in the bid.

1.12 PUMPING

- A. The CONTRACTOR with his own equipment shall do all pumping necessary to prevent flotation of any part of the structures during construction operations.
- B. The CONTRACTOR shall, for the duration of the contract and with his own equipment, pump out water and wastewater which may seep or leak into the excavations or structures. The extent of pumping required in tanks, channels and other non-operating areas will be determined by the ENGINEER. Discharges shall be in conformance with applicable regulations and permits.

1.13 EASEMENT FOR WORK ON PRIVATE PROPERTY

- A. The CONTRACTOR shall maintain his construction operations within the presently existing road right-of-way and established easements throughout the project. In the event that the CONTRACTOR deems it necessary or advisable to operate beyond the limits of the existing right-of-way and established easements, he shall be responsible for making special agreements with the property owners. Immediately after an award of contract is made, the CONTRACTOR shall submit to the OWNER a listing of those areas in which he deems it to be necessary to work outside of the road right-of-way or easements. The listing shall be subject to the approval of the OWNER and as construction areas are secured, copies of all written agreements shall be placed on file with the OWNER and ENGINEER.
- B. The CONTRACTOR shall be responsible for any encroachments on rights-of-way or property of the public or adjoining property owners and shall hold the OWNER, ENGINEER and Consultant(s) harmless because of any encroachments which may be a result of his lack of proper layout. In this regard, he shall, without extra cost to the OWNER, move any work or that portion of any work that encroaches on the property of others, or that is built beyond legal building or setback limits, and he shall rebuild the affected work or portion of work at the proper location and in full compliance with the Contract Documents.
- C. Before final payment will be authorized, the CONTRACTOR will be required to furnish the OWNER with written releases from property owners or public agencies where side agreements or special easements have been made by the CONTRACTOR or when the CONTRACTOR's operations, for any reason, have not been kept within the construction easements by the OWNER.
- D. In the event the CONTRACTOR is unable to secure the written releases required in the above paragraph, he shall inform the OWNER of the reasons for his failure to do so. The OWNER or its representatives will then examine the site and the OWNER will direct the CONTRACTOR to complete any work that may be necessary to satisfy the terms of the permit or easement. Should the CONTRACTOR refuse to do the work, the OWNER reserves the right to have it done by separate contract and deduct the cost of same from moneys due the CONTRACTOR, or he may require the CONTRACTOR to furnish a bond in a sum satisfactory to the OWNER to cover any legal claims for damages. When the OWNER is satisfied that the work has been completed in agreement with the Contract Documents and the terms of the permit or easement, he reserves the right to waive the requirement of obtaining the statement if the CONTRACTOR's failure to obtain such statement is due to the grantor's

refusal to sign and this refusal is not based upon any legitimate claims that the CONTRACTOR has failed to fulfill the terms of the license or easement, or if the CONTRACTOR is unable to contact or has undue hardship in contacting the grantors.

1.14 EXAMINATION OF PRIVATE PROPERTY PRIOR TO CONSTRUCTION

- A. If the CONTRACTOR desires to enter private property to determine their condition and/or possible blasting damage prior to construction, the CONTRACTOR shall first obtain a letter of permission and introduction from the OWNER.

1.15 DAILY REPORTS

- A. The CONTRACTOR shall submit daily reports of construction activities, including non-work days. The report shall include:
 - 1. Manpower, number of men by craft;
 - 2. Equipment on the project;
 - 3. Major deliveries;
 - 4. Activities work with reference to the CPM schedule activity numbers;
 - 5. New problems; and
 - 6. Other pertinent information
- B. A similar report shall be submitted for/by each Subcontractor.
- C. The reports shall be submitted to the ENGINEER' within two days of the respective report date. Each report shall be signed by the CONTRACTOR's Superintendent or Project Manager.
- D. Information provided on the daily report shall not constitute notice of delay or any other notice required by the CONTRACT DOCUMENTS. Notice shall be as required therein.

1.16 FINAL GUARANTEE

- A. All work shall be guaranteed by the CONTRACTOR for a period of one year from and after the date of Initiation of Operation by the OWNER.
- B. If, within the guarantee period, repairs or changes are required in connection with guaranteed work, which, in the opinion of the OWNER, is rendered necessary as the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the CONTRACTOR shall, promptly upon receipt of notice from the OWNER and without expense to the OWNER, do the following:
 - 1. Place in satisfactory condition in every particular all of such

- guaranteed work and correct all defects therein.
2. Make good all damage to the building or site, or equipment or piping or contents thereof, which, in the opinion of the OWNER, is the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the contract.
 3. Make good any work or material, or the equipment and contents of building, structure or site disturbed in fulfilling any such guarantee.
 4. Restart the warranty period as follows: Where defective Work (and damage to other Work resulting therefrom) has been corrected, removed, or 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.
- C. If the CONTRACTOR, after notice, fails within ten days to proceed to comply with the terms of this guarantee, the OWNER may have the defects corrected, and the CONTRACTOR and his surety shall be liable for all expense incurred, provided, however, that in case of an emergency where, in the opinion of the OWNER, delay would cause loss or damage, repairs may be started without notice being given to the CONTRACTOR and the CONTRACTOR shall pay the cost thereof.
- D. All special guarantees or warranties applicable to specific parts of the work as may be stipulated in the Contract Specifications or other papers forming a part of this Contract shall be subject to the terms of this paragraph during the first year of life of each such guarantee. All special guarantees and MANUFACTURERS' warranties shall be assembled by the CONTRACTOR and delivered to the ENGINEER, along with a summary list thereof, before the acceptance of the work.

1.17 OWNER-FURNISHED MATERIAL

- A. The CONTRACTOR shall furnish all materials required to complete the work. No materials will be furnished by the OWNER.

1.18 SPARE PARTS: (Refer to Section 11100 of these Specifications)

1.19 MAINTENANCE AND LUBRICATION SCHEDULES] (Refer to Section 11100 of these Specifications)

1.20 EMERGENCIES

- A. The CONTRACTOR shall at all times after regular working hours, including weekend and holidays, maintain a telephone where he or his

representative can be reached on an emergency basis. The CONTRACTOR or his representative shall be prepared to act to correct conditions on the site deemed to constitute an emergency by either the OWNER, his agent, the ENGINEER or local authorities and is obligated to act to prevent threatened damage, injury or loss without special instructions from the OWNER or ENGINEER. The CONTRACTOR shall give the ENGINEER prompt written notice of all significant changes in the work or deviations from the Contract Documents caused thereby. If a condition on the site requires attention after working hours, either the OWNER, agent, ENGINEER, or local Authority shall call the CONTRACTOR or his representative at the emergency telephone number, identify himself and describe the emergency condition. The CONTRACTOR is expected to dispatch personnel and equipment to adequately institute corrective measures within two (2) hours. If for some reason the CONTRACTOR or his agent cannot be reached at the emergency number after a reasonable time (2-hour), the OWNER shall have the right to immediately initiate corrective measures, and the cost shall be borne by the CONTRACTOR.

- B. In the event that the CONTRACTOR fails to maintain safe job conditions and traffic conditions, including, but not limited to, trench settlement and hazardous storage of backfill or construction materials, the OWNER, after failure of the CONTRACTOR to commence substantial steps at the job site to rectify the situation within two (2) hours of the time the CONTRACTOR has been notified of the unsafe condition, may hire guards, take such precautions, make such repairs and take any other steps which the OWNER or the OWNER'S agent in its discretion, considers necessary to protect the property, persons, or the OWNER. The cost of any of these precautions, guards, or steps shall be deducted from the payments due the CONTRACTOR, and the CONTRACTOR will be billed for these services, work and material at prevailing rates.

1.21 CLAIM OR PROPERTY DAMAGES AND CITIZEN'S CONCERNS/INQUIRIES

- A. In the event of any indirect or direct damage to public or private property caused in whole or in part by an act, omission or negligence on the part of the CONTRACTOR, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable, the CONTRACTOR shall at his own expense and cost promptly remedy and restore such property to a condition equal to or better than that existing before such damage was done. The CONTRACTOR shall perform such restoration by underpinning, repairing, rebuilding, replanting, or otherwise restoring as may be required by the ENGINEER or OWNER, or shall make good such damage in a satisfactory and acceptable manner. In case of failure on the part of the CONTRACTOR to promptly restore such property or make good such damage, the OWNER may, upon five (5) calendar days written notice,

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proceed to repair, rebuild or otherwise restore such property as may be necessary and the cost thereof, or a sum sufficient in the judgement of the OWNER to reimburse the owners of the property so damaged, will be deducted from any monies due or to become due the CONTRACTOR under the Contract.

PART 2 - PRODUCTS
(Not Applicable)

PART 3 - EXECUTION
(Not Applicable)

END OF SECTION 01100

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SECTION 01110 - ENVIRONMENTAL PROTECTION PROCEDURES

PART 1- GENERAL

1.1 SCOPE OF WORK

- A. The work covered by this Section consists of furnishing all labor, materials and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Specification, 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/or recreational purposes; or violate any applicable environmental regulations.
- B. The control of environmental pollution requires consideration of air, water and land, and involves management of noise, odor, and solid waste, as well as other pollutants.
- C. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion control measures such as diversion channels, sedimentation or filtration systems, berms, staked hay bales, seeding, mulching or other special surface treatments as are required by regulatory authorities to prevent silting and muddying of streams, rivers, canals, impoundments, lakes, etc. All erosion control measures shall be in place in an area prior to any construction activity in that area.
- D. These Specifications are intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the CONTRACTOR's responsibility to determine the specific construction techniques to meet these guidelines.
- E. The CONTRACTOR shall secure, if required, at his cost, a surface water management permit from the Northwest Florida Water Management District and approvals from the Florida Department of Environmental Protection, Bay County and/or Panama City Beach for any construction dewatering activities associated with this project.

1.2 APPLICABLE REGULATIONS

- A. Comply with all applicable Federal, State and local laws and regulations

concerning environmental pollution control and abatement.

1.3 NOTIFICATIONS

- A. The OWNER through the ENGINEER will notify the CONTRACTOR in writing immediately following identification of any non-compliance with the foregoing provisions or of any environmentally-objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the CONTRACTOR in writing, through the ENGINEER, of any non-compliance with State or local requirements. The CONTRACTOR shall, after receipt of such notice from the ENGINEER or from the regulatory agency through the ENGINEER, immediately take corrective action. Such notice, when delivered to the CONTRACTOR or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the CONTRACTOR fails or refuses to comply promptly, the OWNER may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the CONTRACTOR unless it is later determined that the CONTRACTOR was in compliance.

1.4 IMPLEMENTATION

- A. Prior to commencement of the work, meet with the ENGINEER and OWNER to develop mutual understandings relative to compliance with this provision and administration of the environmental pollution control program.
- B. Remove temporary environmental control features, when approved by the OWNER, and incorporate permanent control features into the project at the earliest practicable time.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.1 EROSION CONTROL

- A. Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures, such as siltation basins, hay check dams, mulching, jute netting and other equivalent techniques, shall be used as appropriate. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches

shall be backfilled and the ground surface restored to original condition.

3.2 PROTECTION OF LAND RESOURCES

- A. Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to areas shown on the Drawings.
- B. Outside of areas requiring earthwork for the construction of the new facilities, the CONTRACTOR shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the ENGINEER. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The CONTRACTOR shall in any event be responsible for any damage resulting from such use.
- C. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the CONTRACTOR's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.
- D. Any trees or other landscape feature scarred or damaged by the CONTRACTOR's equipment or operations shall be restored as nearly as possible to its original condition. The OWNER and ENGINEER will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of.

All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1 inch in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.

Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the CONTRACTOR and are beyond saving in the opinion of a certified nurseryman, shall be immediately removed and replaced in kind and maintained until growth is assured.

- E. The locations of the CONTRACTOR's storage, and other construction buildings, required temporarily in the performance of the work, shall be

cleared portions of the job site or areas to be cleared as shown on the Drawings and shall require written concurrence of the OWNER. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the ENGINEER.

- F. If the CONTRACTOR proposes to construct temporary roads or embankments and excavations for plant and/or work areas, he shall submit the following for approval by the ENGINEER at least ten days prior to scheduled start of such temporary work.
1. A layout of all temporary roads, excavations and embankments to be constructed within the work area.
 2. Details of temporary road construction.
 3. Drawings and cross sections of proposed embankments and their foundations, including a description of proposed materials.
 4. A landscaping drawing showing the proposed restoration of the area. Removal of any trees and shrubs outside the limits of existing clearing area shall be indicated. The drawing shall also indicate location of required guard posts or barriers required to control vehicular traffic passing close to trees and shrubs to be maintained undamaged. The drawing shall provide for the obliteration of construction scars as such and shall provide for a natural appearing final condition of the area. Modification of the CONTRACTOR's approved drawings shall be made only with the written concurrence of the OWNER. No unauthorized road construction, excavation or embankment construction including disposal areas will be permitted.
- G. Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as requested by the ENGINEER. It is anticipated that excavation, filling and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and sodded as described in these Specifications.
- H. All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.

3.3 PROTECTION OF AIR QUALITY

- A. Burning. The use of burning at the project site for the disposal of refuse and debris shall be approved by the OWNER and will require a permit from the City of Panama City Beach and State of Florida Division of Forestry.

- B. Dust Control. The CONTRACTOR will be required to maintain all excavations, embankment, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded, and which would cause a hazard or nuisance to others.
- C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of petroleum products is prohibited. The use of chlorides may be permitted with concurrence from the appropriate regulatory authority.
- D. Sprinkling, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the CONTRACTOR must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs.

3.4 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

- A. During the life of this Contract, maintain all facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created. All pollution control devices shall be inspected regularly, to ensure they are operating correctly.

3.5 NOISE CONTROL

- A. The CONTRACTOR shall make every effort to minimize noises caused by his operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with State and Federal regulations.

3.6 NPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION SITE

- A. The CONTRACTOR shall comply with stormwater discharge regulations and Amendments to the Clean Water Act (33 U.S.C. 1251 et seq.). On September 17, 1992, the State of Florida certified the general permit for stormwater discharges from construction sites for use in Florida. This project is governed by regulations under this general permit.
- B. Under these regulations, construction projects that disturb more than five acres must have and comply with a stormwater pollution prevention plan.

This plan shall be completed and signed by the CONTRACTOR prior to initiation of any construction activities on the site.

- C. The CONTRACTOR shall ensure that all employees and subcontractors implement the specified erosion control practices to properly manage stormwater.

3.7 FDEP GENERIC DEWATERING DISCHARGE PERMIT

- A. The CONTRACTOR shall be responsible for securing a generic dewatering discharge permit under the requirements of Florida Administrative Code Section 62-621.300.2A) if required.
- B. Should the existing groundwater quality not meet the criteria for the receiving water body, the CONTRACTOR shall either make arrangements with neighboring wastewater utilities to receive dewatering discharge or provide necessary chemicals and treatment required to meet the receiving water quality criteria.

END OF SECTION 01110

SECTION 01150 - MEASUREMENT AND PAYMENT

PART 1 - SCOPE OF WORK

The scope of this section of the Contract Documents is to further define the items included in each Bid Item in the Bid Proposal section of these Specifications. Payment will be made based on the specified items included in the description in this section for each bid item.

1.1 GENERAL

All Contract Prices included in the Bid Proposal section will be full compensation for all labor, materials, tools, equipment and incidentals necessary to complete the construction as shown on the drawings and/or as specified in the Contract Documents to be performed under this contract. Actual quantities of each item bid on a unit price basis will be determined upon completion of the construction in the manner set up for each item in this section of the specifications. Payment for all items listed in the Bid Form will constitute full compensation for all work shown and/or specified to be performed under this project.

1.2 ESTIMATED QUANTITIES

The quantities shown are approximate and are given only as a basis of calculation upon which the award of the Contract is to be made. The Owner/Engineer does not assume any responsibility for the final quantities, nor shall the Contractor claim misunderstanding because of such estimate of quantities. Final payment will be made only for satisfactorily completed quantity of each item.

1.3 WORK OUTSIDE AUTHORIZED LIMITS

No payment will be made for work constructed outside the authorized limits of work.

1.4 MEASUREMENT STANDARDS

Unless otherwise specified for the particular items involved, all measurements of distance shall be taken horizontally or vertically.

1.5 AREA MEASUREMENTS

In the measurement of items to be paid for on the basis of area of finished work, the lengths and/or widths to be used in the calculations shall be the final dimensions measured along the surface of the completed work within the neat

lines shown or designated.

1.6 LUMP SUM ITEMS

Where payment for items is shown to be paid on a lump sum basis, no separate payment will be made for any item of work required to complete the lump sum item. Lump sum bid items shall be complete, tested and fully operable prior to request for final payment. **Measurement shall be based upon the Engineer's estimate of percent complete per partial payment period.**

1.7 UNIT PRICE ITEM

Separate payment will be made for the items of work described herein and listed on the Bid Form. Any related work not specifically listed, but required for satisfactory completion of the work shall be considered to be included in the scope of the appropriate listed work items.

1.8 OTHER PROVISIONS

No separate payment will be made for the following items and the cost of such work shall be included in the applicable pay items of work unless indicated otherwise in the individual bid item. Final payment shall not be requested by the Contractor or made by the Owner until record drawings have been submitted to the Engineer.

- Sheeting and shoring
- Clearing, grubbing and grading.
- Replacement and/or repair of existing utilities damaged during construction.
- Trench excavation, including necessary pavement removal, rock removal, and muck removal.
- Ditch and swale restoration.
- Dewatering and disposal of surplus water, including permitting if required.
- Structural fill, backfill and grading.
- Adjusting existing valve boxes, manhole frames and covers and other structures.
- Foundation and borrow materials.
- Testing and placing system in operation.
- Any material and equipment required to be installed and utilized for the tests.
- Maintain the existing quality of service during construction.
- Appurtenant work as required for a complete and operable system.

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PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

BASE BID

3.1 BID ITEM NO. 1 - MOBILIZATION/DEMobilIZATION

Payment for all work included under this bid item will be made at the lump sum price bid for mobilization and demobilization of all labor, equipment, materials and appurtenances necessary for construction of the project. Mobilization shall include all 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. Also included as part of this bid item is the cost for project performance bonds, insurance, indemnifications, photographs, shop drawings, working drawings, schedules, record drawings and documents, coordination, and phasing and other miscellaneous items associated with the work. Measurement for this bid item will be lump sum. **The lump sum price for mobilization/demobilization will be limited to three percent (3%) of the total contract base bid amount.** Seventy percent (70%) of the lump sum price will be payable with the first month's partial payment. The remaining thirty percent (30%) will be payable with the final partial payment.

3.2 BID ITEM NO. 2 – BONDS AND INSURANCE

Payment for this bid item shall be made at the lump sum price bid for all bonds and insurance policies as required by the Contract Documents. Payment will be made only after proper documentation is provided to the Engineer. Measurement of this bid item shall be lump sum. **THIS ITEM BID SHALL NOT EXCEED 2.0% OF THE ENTIRE CONTRACT BASE BID AMOUNT.**

3.3 BID ITEM NO. 3- PREVENTION, CONTROL AND ABATEMENT OF EROSION AND WATER POLLUTION

Payment for all work included under this bid item will be made at the lump sum price bid for all work associated with the prevention, control and abatement of erosion and water pollution in accordance with the contract documents. Payment shall include all items and incidentals necessary to complete the work in conformance with NPDES and other permit requirements. Measurement for work included under this bid item will be lump sum.

3.4 BID ITEM NO. 4 – SURVEYING, RECORD DRAWINGS AND O&M MANUALS

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Payment for the work included under this bid item shall be made at the lump sum price bid for all work associated with furnishing all surveys and preparation of record drawings as required under the contract documents. Payment shall constitute complete compensation for all labor, materials and equipment necessary to complete this work item. Measurement for the work included under this bid item shall be lump sum. THIS ITEM BID SHALL NOT EXCEED 1.5% OF THE ENTIRE CONTRACT BASE BID AMOUNT

3.5 BID ITEM NO. 5 – SELECTIVE DEMOLITION OF LIFT STATION 21 AND SALVAGE OF COMPONENTS INDICATED

Payment for all work included under this bid item will be made at the lump sum price bid for selective demolition of the existing Lift Station 21 and salvage of components indicated in accordance with the contract documents. Payment shall include, but not be limited to dewatering, excavation, demolition, removal and disposal of all resulting materials, removal and salvage of existing control and SCADA remote terminal unit (RTU), backfill material and all other items and incidentals necessary to demolish the existing Lift Station 21 as described in the contract documents complete in every detail. Payment shall constitute complete compensation for all labor, materials and equipment necessary to complete this work item. Measurement for the work included under this bid item shall be lump sum.

3.6 BID ITEM NO. 6 – SITEWORK FOR LIFT STATION 21

Payment for all work included under this bid item will be made at the respective lump sum price bid for all sitework indicated in accordance with the contract documents. Payment shall include, but not be limited to maintenance of traffic, clearing, grubbing, dewatering, earthwork, pavement removal and replacement, driveway, grassing and all other sitework items and incidentals necessary to construct the proposed Lift Station 21 as described in the contract documents complete in every detail. Payment shall constitute complete compensation for all labor, materials and equipment necessary to complete this work item. Measurement for the work included under this bid item shall be lump sum.

3.7 BID ITEM NO. 7 - CONSTRUCT PROPOSED LIFT STATION 21, WETWELL TOP SLAB, HATCHES, PUMPS, CONTROL & RTU PANELS, VALVE VAULT, PIPING, ALL ELECTRICAL, ETC.

Payment for all work included under this bid item will be made at the respective lump sum price bid for furnishing and installing the lift station improvements in accordance with the contract documents. Payment shall include, but not be limited to layout, dewatering, excavation, bedding, precast items, backfilling, hatches, pumps, control package, valve vault, piping, all electrical work, flushing, testing, by-pass pumping and all other items and incidentals necessary to

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construct a fully functional lift station as described in the contract documents complete in every detail. Payment shall constitute complete compensation for all labor, materials and equipment necessary to complete this work item. Measurement for the work included under this bid item shall be lump sum.

3.8 BID ITEM NO. 8 – CONSTRUCT ALL OTHER IMPROVEMENTS FOR LIFT STATION 21

Payment for all work included under this bid item will be made at the respective lump sum price bid for furnishing and installing all other improvements required for the construction of Lift Station 21 not listed above in accordance with the contract documents, complete in every detail. Payment shall include all other items necessary for construction of the improvements indicated in the contract documents complete in every detail. Payment shall constitute complete compensation for all labor, materials and equipment necessary to complete this work item. Measurement for the work included under this bid item shall be lump sum.

3.9 BID ITEM NO. 9 – TESTING ALLOWANCE

The Owner has allocated the amount indicated as a testing allowance for quality control testing during construction. The Contractor shall employ, coordinate and direct the services of independent testing laboratories required for all testing. The Contractor shall pay all testing laboratory invoices and submit them for reimbursement. Payment for work completed under this item shall be made at the direct invoice amount without markup of any kind.

3.10 BID ITEM NO. 10 – PERMIT FEE ALLOWANCE

The Owner has allocated the amount indicated as a permit fee allowance. The Contractor is responsible to initially pay all permit fees associated with the work. The Owner will reimburse the Contractor the actual amount of the permit fee for all paid permit fees provided copies of the paid receipts are included with the Contractor's request for payment. Payment will be based upon the actual permit fee amount without markup of any kind.

3.11 BID ITEM NO. 11 – GULF POWER ALLOWANCE

Contractor is responsible for providing all materials, making all arrangements/provisions for and coordination of installation of electrical service to the proposed, modified lift station. However, Owner shall reimburse the actual cost of Gulf Power service installation fees from this allowance upon submittal of original utility invoice attached to Contractor's monthly pay request. Contractor shall establish electrical service in Contractor's name. After substantial completion is achieved, Contractor shall transfer electrical service to Owner's

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name. Electrical usage charges are NOT reimbursable under this allowance item. Measurement and Payment for work included under this bid item will be based upon actual Gulf Power invoices.

3.12 BID ITEM NO. 12 – HOLD HARMLESS

Payment for this bid item will be made at the lump sum price bid of ten dollars (\$10.00) for agreeing to Hold Harmless and indemnify the Owner and Engineer as specified in the Contract Documents.

ADDITIVE ALTERNATES

4.1 BID ITEM 1 – FURNISH AND INSTALL HIGH PERFORMANCE PROTECTIVE COATING (SPECTRASHIELD) ON LIFT STATION 21 INTERIOR

Payment for all work included under this bid item will be made at the respective lump sum price bid for furnishing and installing a high performance coating on the interior of the Lift Station 21 wetwell. Payment shall include all other items necessary for surface preparation and application of the high performance coating indicated in the contract documents complete in every detail. Payment shall constitute complete compensation for all labor, materials and equipment necessary to complete this work item. Measurement for the work included under this bid item shall be lump sum.

END OF SECTION 01150

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. The CONTRACTOR shall submit to the ENGINEER for review such working drawings, shop drawings, test reports and data on materials and equipment (hereinafter in this Section called data), and material samples (hereinafter in this Section called samples) as are required for the proper control of work, including but not limited to those working drawings, shop drawings, data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.
- B. The CONTRACTOR shall note that there are specific submittal requirements in other sections of these Specifications.
- C. The CONTRACTOR is to maintain an accurate updated submittal log and shall bring this log to each scheduled progress meeting with the OWNER and the ENGINEER. This log should include the following items:
 - 1. Submittal-Description and File Number assigned.
 - 2. Date to ENGINEER.
 - 3. Date returned to CONTRACTOR (from ENGINEER).
 - 4. Status of Submittal
 - a. Reviewed
 - b. Furnish as Corrected
 - c. Revise and Resubmit
 - d. Submit Specific Item
 - e. Rejected
 - 5. Date of Resubmittal and Return (as applicable).
 - 6. Date material released (for fabrication).
 - 7. Projected date of fabrication.
 - 8. Projected date of delivery to site.
 - 9. Status of O&M submittal

1.2 SHOP DRAWINGS

- A. When used in the Contract Documents, the term "shop drawings" shall be considered to mean CONTRACTOR's plans for material and equipment which become an integral part of the Project. These drawings shall be complete and detailed. Shop drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, bills of material, wiring and control diagrams, and inspection and test reports including performance curves and certifications as applicable to the Work.

- B. All details on shop drawings submitted for approval shall show clearly the elevations of the various parts to the main members and lines of the structure and/or equipment, and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the shop drawings before being submitted for approval.
- C. See Shop Drawing Schedule requirements in subparagraph 1.7 CONTRACTOR'S RESPONSIBILITY.

1.3 PRODUCT DATA

- A. Product data as specified in individual sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, MANUFACTURER'S printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing storage instructions, and printed product warranties, as applicable to the work.

1.4 WORKING DRAWINGS

- A. When used in the Contract Documents, the term "working drawings" shall be considered to mean the CONTRACTOR's plans for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and falsework; for underpinning; and for such other work as may be required for construction but does not become an integral part of the Project.
- B. Working drawings shall be signed and sealed by a registered Professional Engineer, currently licensed to practice in the State and shall convey, or be accompanied by, calculations or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Prior to commencing such work, working drawings must have been reviewed without specific exceptions by the ENGINEER. Such review will be for general conformance and will not relieve the CONTRACTOR in any way from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error are assumed by the CONTRACTOR; the OWNER and ENGINEER shall have no responsibility therefor.

1.5 SAMPLES

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- A. The CONTRACTOR shall furnish, for the approval of the ENGINEER, samples required by the Contract Documents or requested by the ENGINEER. Samples shall be delivered to the ENGINEER as specified or requested and in quantities and sizes as specified. A minimum of two samples of each item shall be submitted unless otherwise specified. The CONTRACTOR shall pre-pay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the ENGINEER.
- B. Samples specified in individual sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and units of work to be used by the ENGINEER or OWNER for independent inspection and testing, as applicable to the Work.
- C. The CONTRACTOR shall prepare a transmittal letter in triplicate for each shipment of samples. The CONTRACTOR shall enclose a copy of this letter with the shipment and send a copy of this letter to the ENGINEER. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.
- D. Approved samples not destroyed in testing shall be sent to the ENGINEER or stored at the site of the work. Materials and equipment incorporated in work shall match the approved samples. Samples which fail testing or are not approved will be returned to the CONTRACTOR at his expense, if so requested at time of submission.

1.6 SUBMITTAL REQUIREMENTS

- A. The CONTRACTOR shall review, approve, and submit, with reasonable promptness and in such sequence as shown on the Shop Drawing Submittal Schedule so as to cause no delay in the Contract Work or in the Work of the OWNER or any separate contractor, all shop drawings, product data, working drawings and samples required by the Contract Documents.
- B. The CONTRACTOR shall submit electronically one digital copy of the submittal in pdf version and four (4) printed copies of all shop drawings for the ENGINEER to review, of which the ENGINEER will retain two (2) sets.
- C. All submittals shall be made directly to the ENGINEER.

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- D. Shop drawings, product data, working drawings and samples shall be furnished with the following information:
1. Number and title of the drawing.
 2. Date of drawing or revision.
 3. Name of project building or facility.
 4. Name of contractor, subcontractor, and manufacturer submitting drawing.
 5. Clear identification of contents, location of the work, and the sheet numbers and specification section where the product is found in the contract drawings.
 6. CONTRACTOR Certification Statement.
 7. Submittal Number.
 8. Contract Drawing Number Reference.
- E. In accordance with subparagraph 1.7 A, each shop drawing, working drawing, sample, and catalog data submitted by the CONTRACTOR shall have affixed to it the following Certification Statement, signed by the CONTRACTOR: "Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all CONTRACTOR requirements."
- F. All items specified are not necessarily intended to be a manufacturer's standard product. Variations from specified items will be considered on an "or equal" basis. If submittals show variations from Contract requirements because of standard shop practice or for other reasons, the CONTRACTOR shall describe such variations in his letter of transmittal and on the shop drawings along with notification of his intent to seek contract adjustment. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the CONTRACTOR fails to describe such variations he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed. Variations submitted but not described may be cause for rejection. Any variations initiated by the CONTRACTOR will not be considered as an addition to the scope of work unless specifically noted and then approved as such in writing by the ENGINEER.
- G. Data on materials and equipment shall include materials and equipment lists giving, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, material, size, finish, and all other pertinent data.
- H. For all mechanical and electrical equipment furnished, the

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CONTRACTOR shall provide a list including the equipment name, and address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained. In addition, a maintenance and lubrication schedule for each piece of equipment shall be submitted as specified in Section 01730.

- I. All MANUFACTURERS or equipment suppliers who propose to furnish equipment or products under Divisions 11, 13, 14, 15 and 16 shall submit an installation list to the ENGINEER along with the required shop drawings. The installation list shall include all installations where identical equipment has been installed and has been in operation for a period of at least one (1) year.
- J. The CONTRACTOR shall use the color "green" to make his remarks on the Submittals. Only the ENGINEER will utilize the color "red" in marking submittals.
- K. Facsimiles or copies of facsimiles will not be accepted for review.

1.7 CONTRACTOR'S RESPONSIBILITY

- A. It is the duty of the CONTRACTOR to check, and coordinate with the work of all trades, all drawings, data, schedules and samples prepared by or for him before submitting them to the ENGINEER for review. Each and every copy of any drawing or data sheet larger than 11"x17" shall bear CONTRACTOR's stamp showing that they have been so checked and approved. Drawings or data sheets 11"x17" and smaller shall be bound together in an orderly fashion and bear the CONTRACTOR's stamp on the cover sheet. The cover sheet shall fully describe the packaged data and include a list of all sheet numbers within the package. Shop drawings submitted to the ENGINEER without the CONTRACTOR's stamp will be returned to the CONTRACTOR, without review at the ENGINEER's option, for conformance with this requirement.
- B. The CONTRACTOR shall review shop drawings, product data, and samples prior to submission to determine and verify the following:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Manufacturer's catalog numbers and similar data.
 - 4. Conformance with Specifications.
- C. Shop drawings shall indicate any deviations in the submittal from the requirements of the Contract Documents.
- D. At a time decided upon at the preconstruction meeting the CONTRACTOR shall furnish the ENGINEER a Shop Drawing schedule

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fixing the respective dates for the initial submission of shop and working drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall be provided as a separate entity and indicate those submittals that are critical to the progress schedule. The CONTRACTOR shall prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work sections of the Specifications, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. No extension of time will be authorized because of the CONTRACTOR's failure to transmit complete and acceptable submittals sufficiently in advance of the Work.

- E. The CONTRACTOR shall not begin any work affected by a submittal returned not approved. Before starting this work all revisions must be corrected by the CONTRACTOR. After resubmittal they will be reviewed and returned to him by the ENGINEER. If approved or approved as noted, then the CONTRACTOR may begin this work. Any corrections made to the shop drawings are to be followed without exception.
- F. The CONTRACTOR shall submit to the ENGINEER all shop drawings and data sufficiently in advance of construction requirements to provide no less than **twenty-one (21)** calendar days for review from the time the ENGINEER receives them. No less than **thirty (30)** calendar days will be required for major equipment that requires review by more than one (1) engineering discipline.
- G. The CONTRACTOR shall be responsible for and bear all cost of damages which may result from the ordering of any material or from proceeding with any part of work prior to the review and approval by ENGINEER of the necessary shop drawings.
- H. All shop drawings, product data, working drawings and samples submitted by subcontractors for approval shall be sent directly to the CONTRACTOR for checking. The CONTRACTOR shall be responsible for their submission according to the approved shop drawing schedule so as to prevent delays in delivery of materials and project completion.
- I. The CONTRACTOR shall check all subcontractor's shop drawings, product data, working drawings and samples regarding measurements, size of members, materials, and details to satisfy himself that they are in conformance to the Contract Documents. Shop drawings found to be inaccurate or otherwise in error shall be returned to the subcontractors for correction before submission to the ENGINEER.

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- J. Requests for Information (RFI) shall be submitted on a standard form provided by the ENGINEER. RFIs shall indicate their importance to the timely completion of the project. RFIs will be processed as a shop drawing unless there is an urgent need for immediate response.
- 1.8 ENGINEER'S REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES
- A. The ENGINEER's review is for general conformance with the design concept and contract drawings. Markings or comments shall not be construed as relieving the CONTRACTOR from compliance with the contract plans and specifications or from departures therefrom. The CONTRACTOR remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.
- B. The review of shop drawings, data, and samples will be general. They shall not be construed:
1. As permitting any departure from the Contract requirements;
 2. As relieving the CONTRACTOR of responsibility for any errors, including details, dimensions, and materials;
 3. As approving departures from details furnished by the ENGINEER, except as otherwise provided herein.
- C. If the shop drawings, data or samples as submitted describe variations per subparagraph (1.6F), and show a departure from the Contract requirements which ENGINEER finds to be in the interest of the OWNER and to be so minor as not to involve a change in Contract Price or time for performance, the ENGINEER may return the reviewed drawings without noting an exception.
- D. Submittals will be returned to the CONTRACTOR under one of the following:
- "APPROVED" is assigned when there are no notations or comments on the submittal. When returned under this code the CONTRACTOR may release the equipment and/or material for manufacture.
- "FURNISH AS CORRECTED" is assigned when notations or comments have been made on the submittal pointing out minor discrepancies as compared with the Contract Documents. Re-submittal is not necessary prior to release for manufacturing.
- "REVISE & RESUBMIT." This combination of codes is assigned when the submittal is in noncompliance with the Contract Documents and must be

corrected and the entire package resubmitted. This code generally means that the equipment or material cannot be released for manufacture unless the CONTRACTOR takes full responsibility for providing the submitted items in accordance with Contract Documents.

"REJECTED" is assigned when the submittal does not meet the intent of the Contract Documents. The CONTRACTOR must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.

"SUBMIT SPECIFIC ITEM" is assigned when a specific item was left out. The CONTRACTOR must turn in a submittal on that item to bring the entire package into conformance. The entire package does not have to be resubmitted.

- E. Re-submittals will be handled in the same manner as first submittals. On re-submittals the CONTRACTOR shall direct specific attention, in writing on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the ENGINEER on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the CONTRACTOR. The CONTRACTOR shall make corrections to any work done because of this type revision that is not in accordance to the Contract Documents as may be required by the ENGINEER.
- F. If the CONTRACTOR considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the CONTRACTOR shall give written notice thereof to the ENGINEER at least seven (7) working days prior to release for manufacture.
- G. The ENGINEER will review a submittal a maximum of two (2) times after which cost of review will be borne by the CONTRACTOR. The cost of engineering shall be equal to the ENGINEER's charges to the OWNER under the terms of the ENGINEER's agreement with the OWNER.
- H. When the shop drawings have been completed to the satisfaction of the ENGINEER, the CONTRACTOR shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the ENGINEER.
- I. Partial submittals may not be reviewed. The ENGINEER will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the CONTRACTOR, and will be considered "Rejected" until resubmitted. The ENGINEER may at his option provide a list or mark the submittal directing the CONTRACTOR to the areas that are incomplete.

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1.9 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

- A. If specifically required in other sections of these Specifications, the CONTRACTOR shall submit a P.E. Certification for each item required, in the form attached to this Section, completely filled in and stamped.

1.10 FINAL COMBINED SUBMITTAL OF DIGITAL VERSION OF SHOP DRAWING SUBMITTALS

- A. At the completion of the project, a digital version of all shop drawing submittals and review forms in pdf format shall be compiled and provided to the ENGINEER as an appendix to the Operation and Maintenance Manual as required in Section 01730 - Operation and Maintenance Data. Should no component of the construction necessitate an Operation and Maintenance Manual, the compendium of submittals in digital form shall be submitted as a final shop drawing submittal for review by the ENGINEER.

PART 2 – PRODUCTS
(Not Applicable)

PART 3 – EXECUTION
(Not Applicable)

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P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the (State) of Florida and that he/she has been employed by (Name of Contractor) _____ to design _____ in accordance with Specification Section _____. The undersigned further certifies that he/she has performed the design of the _____, that said design is in conformance with all applicable local, state and federal codes, rules, and regulations, and that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the OWNER or OWNER's representative with seven (7) days following written request therefore by the OWNER.

P.E. Name

Signature

Address

Contractor's Name

Signature

Title

Address

END OF SECTION 01300

SECTION 01370 - SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. The Contractor shall submit to the Engineer a Schedule of Values allocated to the various portions of the work, within 10 days after date of Notice to Proceed.
- B. Upon request of the Engineer, the Contractor shall support the values with data which will substantiate their correctness.
- C. The Schedule of Values, shall be used only as the basis for the Contractor's Applications for Payment.

1.2 RELATED REQUIREMENTS

- A. Conditions of the Contract.
- B. Request for Payment.

1.3 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. Contractor's standard forms and automated printout will be considered for approval by Engineer upon Contractor's request. Identify schedule with:
 - 1. Title of Project and location.
 - 2. Project number.
 - 3. Name and address of Contractor.
 - 4. Contract designation.
 - 5. Date of submission.
- B. Schedule shall list the installed value of the component parts of the work in sufficient detail to serve as a basis for computing values for progress payments during construction.
- C. Follow the table of contents for the Contract Document as the format for listing component items for structures:
 - 1. Identify each line item with the number and title of the respective major section of the specification.

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- 2. For each line item, list sub-values of major products or operations under item.
- D. Follow the bid sheets included in this Contract Document as the format for listing component items for pipelines.
- E. The sum of all values listed in the schedule shall equal the total Contract Sum.

1.4 SUBSCHEDULE OF UNIT MATERIAL VALUES

- A. Submit a sub-schedule of unit costs and quantities for products on which progress payments will be requested for stored products.
- B. The form of submittal shall parallel that of the Schedule of Values with each item identified the same as the line item in the Schedule of Values.
- C. The unit quantity for bulk materials shall include an allowance for normal waste.
- D. The installed unit value multiplied by the quantity listed shall equal the cost of that item in the Schedule of Values.

END OF SECTION 01370

SECTION 01410 - TESTING AND TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Contractor shall employ and pay for the services of an Independent Testing Laboratory to perform testing specifically indicated in the Contract Documents and may at any other time elect to have materials and equipment tested for conformity with the Contract Documents. These tests include soil compaction tests and concrete cylinder tests.
 - 1. Contractor shall cooperate with the laboratory to facilitate the execution of its required services.
 - 2. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the work of the Contract.
 - 3. The Testing Laboratory shall be acceptable to the Owner and approved by the Owner/Engineer. Unless specifically allowed otherwise by the Owner, the Testing Laboratory that performed any design phase geotechnical work and has provided foundation and backfill recommendations in the bid documents shall be used to perform the construction phase testing also.

1.2 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.

1.3 CONTRACTOR'S RESPONSIBILITIES

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

- D. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. The Owner/Engineer may require the Contractor to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the Owner shall be allowed on account of such testing certifications.
- E. Furnish incidental labor and facilities;
1. To provide access to work to be tested.
 2. To obtain and handle samples at the project site or at the source of the product to be tested.
 3. To facilitate inspections and tests.
 4. For storage and curing of test samples.
- F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
1. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence.
- G. Employ and pay for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling and testing required for the Contractor's convenience and as approved by the Owner/Engineer.
- H. If the test results indicate the material or equipment complies with the Contract Documents, the Contractor shall pay for the costs of the testing laboratory and submit the invoice without markup for reimbursement under the allowance provided in the Contract. If the tests and any subsequent retests indicate the materials and equipment fail to meet the requirements of the Contract Documents, the Contractor shall pay for the laboratory costs directly to the testing firm without reimbursement.

PART 2 - PRODUCTS
(Not Applicable)

PART 3 - EXECUTION

TESTING AND TESTING LABORATORY
SERVICES

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(Not Applicable)

END OF SECTION 01410

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SECTION 01505 - MOBILIZATION

PART 1 - GENERAL

1.1 DEFINITION AND SCOPE

- A. As required for the proper performance and completion of the Work, mobilization shall include, but not be limited to, the following principal items:
1. Move onto the site all CONTRACTOR'S plant and equipment required for the first month's operation.
 2. Install temporary construction power, wiring, and lighting facilities.
 3. Establish a fire protection plan and safety program.
 4. Secure construction water supply.
 5. Provide on-site sanitary facilities and potable water facilities.
 6. Arrange for and erect CONTRACTOR'S work and storage yard and employee's parking facilities.
 7. Submit all required insurance certificates and bonds.
 8. Obtain all required permits.
 9. Post all OSHA, FDEP, Department of Labor, and all other required notices.
 10. Have CONTRACTOR'S project manager and/or superintendent at the job site full time.
 11. Submit a detailed construction schedule acceptable to the ENGINEER and OWNER.
 12. Submit cash flow in tabular and graphic form to the ENGINEER and OWNER.
 13. Submit a finalized Schedule of Values of the Work in the OWNER'S approved format.
 14. Submit a hurricane preparedness plan acceptable to the ENGINEER and the OWNER.
 15. Erect all required Project signs.

1.2 PAYMENT FOR MOBILIZATION

- A. The CONTRACTOR'S attention is directed to the condition that no payment for mobilization, or any part thereof, will be approved for payment under the Agreement until all mobilization items listed above have been completed as specified.

PART 2 - PRODUCTS (Not Applicable)

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PART 3 - EXECUTION
(Not Applicable)

END OF SECTION 01505

SECTION 01620 - STORAGE AND PROTECTION

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

Provide secure storage and protection for products to be incorporated into the work and maintenance and protection for products after installation and until complete of work.

1.2 STORAGE

- A. Store products immediately on delivery and protect until installed in the work.
 - 1. Store in accord with manufacturer's instructions, with seals and labels intact and legible.
- B. Store products subject to damage by elements in substantial weathertight enclosures.
 - 1. Maintain temperatures within ranges required by manufacturer's instructions.
 - 2. Provide humidity control for sensitive products, as required by manufacturer's instructions.
 - 3. Store unpacked products on shelves, in bins or in neat piles, accessible for inspection.
- C. Exterior Storage
 - 1. Provide substantial platform, blocking or skids to support fabricated products above ground, prevent soiling or staining.
 - a. Cover products, subject to discoloration or deterioration from exposure to the elements, with impervious sheet coverings. Provide adequate ventilation to avoid condensation.
 - b. Cover all PVC materials with plastic tarp to protect from sunlight.
- D. Arrange storage in manner to provide easy access for inspection.

1.3 MAINTENANCE OF STORAGE

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- A. Maintain periodic system of inspection of stored products on scheduled basis to assure that:
 - 1. State of storage facilities is adequate to provide required conditions.
 - 2. Required environmental conditions are maintained on continued basis.
 - 3. Surfaces of products exposed to elements are not adversely affected.
 - a. Any weathering of products, coatings and finishes is not acceptable under requirements of these Contract Documents.

1.4 PROTECTION AFTER INSTALLATION

- A. Provide protection of installed products to prevent damage from subsequent operations. Remove when no longer needed, prior to completion of work.
- B. Control traffic to prevent damage to equipment and surfaces.
- C. Provide coverings to protect finished surfaces from damage.

PART 2 - PRODUCTS
(Not Applicable)

PART 3 - EXECUTION
(Not Applicable)

END OF SECTION 01620

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SECTION 01625 - START-UP

PART 1 - GENERAL

1.1 GENERAL

- A. Prior to requesting issuance of the certificate of substantial completion, start-up will be completed as specified herein.
- B. Start-up of project facilities and appurtenances will require cooperation between completion of remaining structures and connection to existing system or (system by others).
- C. All equipment shall be tested and approved by the OWNER/ENGINEER prior to placing the facilities into operation.

PART 2 - MATERIALS (Not Applicable)

PART 3 - EXECUTION

3.1 PRELIMINARY MATTERS

- A. General Requirements:
 - 1. Successfully execute the step-by-step procedure of start-up and performance demonstration specified hereinafter.
 - 2. The start-up and performance demonstration shall be successfully executed prior to substantial completion and acceptance by the OWNER/ENGINEER of the project and its related systems.
 - 3. Field acceptance tests shall be witnessed by the OWNER/ENGINEER. At least 30 calendar days prior to scheduled testing, CONTRACTOR shall submit details of all test procedures to the OWNER/ENGINEER for review.
 - 4. All performance tests and inspections shall be scheduled at least 10 working days in advance or as otherwise specified with the OWNER/ENGINEER. All performance tests and inspections shall be conducted during the normal work week of Monday through Friday, unless otherwise specified.
 - 5. The CONTRACTOR shall be fully responsible for the proper operation of equipment during tests and instruction periods and shall neither have nor make any claim for damage which may occur to equipment prior to the time when the OWNER/ENGINEER takes over the operation thereof.

- B. Preparation for Start-Up: (NOT USED)

3.2 FIELD TESTS

- A. Field tests shall be made to confirm compliance with the CONTRACT and to establish compliance with the technical provision. The test shall be performed by the CONTRACTOR as herein specified. All sewers, water lines, piping, and equipment shall be tested in the field in the presence of the OWNER/ENGINEER or his authorized assistant, in the manner prescribed in the Sections of these Specifications pertaining to such installation. It is the CONTRACTOR's responsibility to coordinate with other contractors in the testing and acceptance of pipelines that cross contract boundaries.
- B. Hydrostatic and Leakage Tests - Potable Water Lines; Plant Water Lines; Sewer Force Mains:
 1. Pressure and leakage test shall be performed in accordance with the applicable sections of the American Water Works Association Standard for Installation of Cast Iron/Ductile Iron Water Mains, AWWA C-600, except as herein modified.
 2. After completion of all work and before final acceptance, a hydrostatic and leakage test shall be conducted. Water shall be furnished by the OWNER/ENGINEER for testing the potable water lines for the first test only, water used in subsequent tests will be at the CONTRACTOR's expense. Where applicable, the CONTRACTOR shall coordinate the development of the water supply with the pipe line work in order that water will be available to meet these requirements. At no time are valves on the distribution system to be operated without the presence of a duly qualified representative of the OWNER/ENGINEER. Potable water shall be used to test the water mains, and any other pressure lines used to treat the potable water facilities.
 3. A hydrostatic test of the completed pipelines shall be performed under the following static water pressure: potable water lines: 150 psi; irrigation water lines: 150 psi; sewer force mains: 100 psi. The duration of each test shall be for two (2) hours.
 4. The test pump, pipe connection, taps into the pipelines, and all necessary apparatus shall be furnished by the CONTRACTOR. In addition, the CONTRACTOR shall furnish the calibrated test gauge.
 5. All exposed pipes, fittings, valves, hydrants, and joints will be carefully examined during the test, and all joints showing a visible leakage shall be made tight. All defective pipe, fittings, valves, hydrants, and accessories shall be removed from the line and replaced by the CONTRACTOR.

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6. The CONTRACTOR may backfill the trench before he tests the line if he so desires, but he shall open up the trench at his own expense to repair the leaks.
7. A leakage test shall be conducted after the pressure test has been satisfactorily completed. The CONTRACTOR shall furnish the calibrated gauge for this leakage test. All visible leaks shall be corrected regardless of the total leakage as shown by the test. All lines which fail to meet these tests shall be repaired and retested as necessary, until test requirements are complied with. The duration of each leakage test shall be two (2) hours.
8. The installation will not be accepted until the leakage is less than the number of gallons per hour as determined by the formula below:

$$L = \frac{SD(P)^{0.5}}{133,200}$$

in which "L" equals the allowable leakage, in gallons per hour; "S" is the length of the pipe tested, in feet; "D" is the nominal pipe diameter, in inches; and "P" is the average test pressure during the leakage test, in pounds per square inch gauge

9. All tests shall be made in the presence of the OWNER/ENGINEER's representative. No additional compensation will be paid to the CONTRACTOR for making the above tests; the cost of all labor, materials, lubricants, fuels, power, necessary appliances, and the coordination for testing purposes shall be included in the unit price or prices bid or the various items of work.
10. The CONTRACTOR shall give the OWNER/ENGINEER 48 hours advance notice of the time when the installation is ready for hydrostatic and leakage tests.

C. Disinfection of Potable Water Lines and Plant Water Lines

1. All potable water lines and irrigation lines installed under this CONTRACT shall be disinfected by chlorination. Detailed procedures are outlined in Division 2 of these specifications.
2. Potable water lines shall maintain a chlorine residual of at least 50 mg/l after retaining the treated water for the required time. Irrigation lines shall be chlorinated until they meet the requirements for Class III water supplies.
3. Potable water lines shall be tested at the frequency and separation required by the Department of Health and Rehabilitative Services, or two tests every 1,000 feet, whichever is more stringent. Irrigation lines shall be tested once in every 3,000 feet of pipe.

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- D. Infiltration/Leakage Tests - Gravity Sewers
 - 1. General
 - a. All pipelines will be tested for infiltration or leakage by the CONTRACTOR prior to final acceptance of the work. All tests will be conducted in accordance with Division 2.

END OF SECTION 01625

SECTION 01705 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work specified in this section.

1.2 DESCRIPTION OF REQUIREMENTS

Definitions: Closeout is hereby defined to include general requirements near the end of Contract Time, in preparation for final acceptance, final payment, normal termination of Contract, and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of Division 2 through 16. Time of closeout is directly related to "Substantial Completion", and therefore may be either a single time period for entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates, if specifically provided for in the Contract Documents. That time variation (if any) shall be applicable to other provisions of this section.

1.3 PREREQUISITES FOR SUBSTANTIAL COMPLETION

- A. General: Prior to requesting Engineer's review for certification of substantial completion (for either entire work or portions thereof), complete the following and list known exceptions in request:
1. In progress payment request, coincident with or first following date claimed, show either 100% completion for portion of work claimed as "substantially complete", or list incomplete items, value of incompleteness, and reasons for being incomplete.
 2. Include supporting documentation for completion as indicated in these contract documents.
 3. Submit statement showing accounting of changes to the Contract Sum.
 4. Advise Owner of pending insurance change-over requirements.
 5. Submit special warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents.
 6. Obtain and submit releases enabling Owner's full and unrestricted use

of the work and access to services and utilities, including (where required) operating certificate, and similar releases.

7. Submit record drawings, maintenance manuals, and similar final record information.
 8. Deliver tools, spare parts, extra stocks of materials, and similar physical items to Owner.
 9. Complete start-up testing of systems, and instructions of owner's operating/maintenance personnel. Discontinue (or change over) and remove from project site temporary facilities and services, along with construction tools and facilities, mock-ups, and similar elements.
 10. Refer to Section 00800 for additional requirements.
- B. Procedures: Upon receipt of Contractor's request, Engineer will either proceed with the review or advise Contractor of prerequisites not fulfilled. Following initial review, Engineer will either prepare certificate of substantial completion, or advise Contractor of work which must be performed prior to issuance of certificate; and repeat review when requested and determined that work has been substantially completed. Results of completed review will form initial "punch-list" for final acceptance.

1.4 PREREQUISITES FOR FINAL ACCEPTANCE

- A. General: Prior to requesting Engineer's final review for certification of final acceptance and final payment, as required by General Conditions, complete the following and list known exceptions (if any) in request:
1. Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit updated final statement, accounting for additional (final) changes to the Contract Sum.
 3. Submit consent of surety.
 4. Submit final liquidation damages settlement statement, acceptable to Owner.
 5. Revise and submit evidence of final (continuing insurance coverage complying with insurance requirements).

- B. Reinspection Procedure: Upon receipt of Contractor's notice that the work has been completed, including punch-list items resulting from earlier reviews, and excepting incomplete items delayed because of acceptable circumstances, Engineer will review the work. Upon completion of review, Engineer will either prepare certificate of final acceptance or advise Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary, procedure will be repeated. Contractor shall reimburse Owner for Engineer's time beyond 3 walk-throughs and punchlists.

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Specific requirements for record documents are indicated in individual sections of these specifications. Other requirements are indicated in General Conditions. General submittal requirements are indicated in "Submittals" sections. Do not use record documents for construction purposes; protect from deterioration and loss in a secure fire-resistive location; provide access to record documents for Engineer's reference during normal working hours.
- B. Record Drawings: Maintain a set of contract drawings and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on working drawings. Mark with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work. Mark up new information which is recognized to be of importance to Owner, but was for some reason not shown on either the contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable.
- C. Record Specifications: Maintain one copy of specifications, including addenda, change orders and similar modifications issued in printed form during construction, and mark-up variation (of substance) in actual work in comparison with text of specifications and modifications as issued. Give particular attention to substitutions, selection of options, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable. Upon completion of mark-up, submit to Engineer for Owner's records.
- D. Maintenance Manuals: Organize maintenance-and-operating manual information into suitable sets of manageable size, and bind into individual binders properly identified and indexed (thumb tabbed). Include emergency instructions, spare parts listing, copies of warranties, wiring diagrams,

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recommended "turn-around" cycles, inspection procedures, shop drawings, product data, and similar applicable information.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. General Operating/Maintenance Instructions: Arrange for each installer of work requiring continuing maintenance or operation, to meet with Owner's personnel, at project site, to provide basic instructions needed for proper operation and maintenance of entire work. Include instructions by manufacturer's representatives where installers are not expert in the required procedures. Review maintenance manuals, record documentation, tools, spare parts and materials, lubricants, fuels, identification system, control sequences, hazards, cleaning and similar procedures and facilities. Review maintenance and operations in relation with applicable warranties, agreements to maintain, bonds and similar continuing commitments.
- B. Compliances: Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at site, or bury debris or excess materials on Owner's property, or discharge volatile or other harmful or dangerous materials into drainage systems; remove waste materials from site and dispose of in a lawful manner.
- C. Where extra materials of value remaining after completion of the associated work have become Owner's property, dispose of these to Owner's best advantage as directed.

END OF SECTION 01705

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SECTION 01730 - OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. The CONTRACTOR shall compile product data and related information appropriate for OWNER'S maintenance and operation of products furnished under Contract.
 - 1. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent sections of Specifications.
- B. Instruct OWNER'S personnel in maintenance of products and in operation of equipment and systems.
- C. The CONTRACTOR shall submit the final documents after review and approval of the ENGINEER in electronic format as specified in Section 01300.

1.2 QUALITY ASSURANCE

Preparation of data shall be done by personnel:

- 1. Trained and experienced in maintenance and operation of described products.
- 2. Familiar with requirements of this Section.
- 3. Skilled and technical writer to the extent required to communicate essential data.
- 4. Skilled as draftsman competent to prepare required drawings.

1.3 FORM OF SUBMITTALS

- A. Prepare data in form of an instructional manual for use by OWNER'S personnel.
- B. Provide manuals in both printed format and searchable digital format (pdf) on CD.
 - 1. Printed Copy Requirements:
 - a. Size: 8-1/2 inches x 11-inches.
 - b. Paper: 20 pound minimum white, for typed pages.
 - c. Text: MANUFACTURER'S printed data, or neatly printed.

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- d. Drawings:
 - 1. Provide reinforced punched binder tabs, bind in with text.
 - 2. Reduce larger drawings and fold to size of text pages but not larger than 14-inches x 17-inches.
- e. Provide fly-leaf for each separate product, or each piece of operating equipment.
- f. Provide typed description of product, and major component parts of equipment.
- g. Provide indexed tabs.
- h. Cover: identify each volume with typed or printed title "OPERATING & MAINTENANCE INSTRUCTIONS."
 - List:
 - 1. Title of Project
 - 2. Identity of separate structure as applicable.
 - 3. Identity of general subject matter covered in the manual.
- i. Binders
- j. Commercial quality three-post binders with durable and cleanable plastic covers.
- k. Maximum post width: expendability 3 to 5 inches.
- l. When multiple binders are used, correlate the data into related consistent groupings.

2. Digital Copy Requirements

- a. Provide three (3) complete copies of the printed manual in searchable pdf format on CD.

1.4 CONTENT OF MANUAL

- A. Neatly printed table of contents for each volume, arranged in systematic order.
 - 1. CONTRACTOR, name of responsible principal, address and telephone number.
 - 2. A list of each product required to be included, indexed to content of the volume.
 - 3. List, with each product, name, address and telephone number of:
 - a. Subcontractor or installer.
 - b. Maintenance contractor, as appropriate.
 - c. Identify area of responsibility of each.
 - d. Local source of supply for parts and replacement.
 - 4. Identify each product by product name and other identifying symbols as set forth in Contract Documents.
- B. Product Data:

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1. Include only those sheets which are pertinent to the specific product.
 2. Annotate each sheet to:
 - a. Clearly identify specific product or part installed.
 - b. Clearly identify data applicable to installation.
 - c. Delete references to inapplicable information.
- C. Drawings:
1. Supplement product data with drawings as necessary to clearly illustrate:
 - a. Relations of component parts of equipment and systems.
 - b. Control and flow diagrams.
 2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
 3. Do not use Project Record Documents as maintenance drawings.
- D. Written text, as required to supplement product data for the particular installation:
1. Organize in consistent format under separate headings for different procedures.
 2. Provide logical sequence of instructions of each procedure.
- E. Copy of each warranty, bond and service contract issued.
1. Provide information sheet for OWNER'S personnel, give:
 - a. Proper procedures in event of failure.
 - b. Instances which might affect validity of warranties or bonds.

1.5 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit four copies of complete manual in final form.
- B. Content, for each unit of equipment and system, as appropriate:
1. Description of unit and component parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 2. Operating procedures:
 - a. Start-up, break-in, routine and normal operating instructions.
 - b. Regulation, control, stopping, shutdown and emergency instructions.
 - c. Summer and winter operating instructions.
 - d. Special operating instructions.
 3. Maintenance Procedures:
 - a. Routine operations.

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- b. Guide to "troubleshooting."
 - c. Disassembly, repair and reassembly.
 - d. Alignment, adjusting and checking.
 4. Servicing and lubrication schedule.
 - a. List of lubricants required.
 5. MANUFACTURER'S printed operating and maintenance instructions.
 6. Description of sequence of operation by control MANUFACTURER.
 7. Original MANUFACTURER'S parts list, illustrations, assembly drawings and diagrams required for maintenance.
 - a. Predicted life of parts subject to wear.
 - b. Items recommended to be stocked as spare parts.
 8. As-installed control diagrams by controls MANUFACTURER.
 9. Each contractor's coordination drawings.
 - a. As-installed color coded piping diagrams.
 10. Charts of valve tag numbers, with location and function of each valve.
 11. List of original MANUFACTURER'S spare parts, MANUFACTURER'S current prices, and recommended quantities to be maintained in storage.
 12. Other data as required under pertinent sections of Specifications.
- C. Content, for each electric and electronic system, as appropriate:
 1. Description of system and component parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 2. Circuit directories of panelboards.
 - a. Electrical service.
 - b. Controls.
 - c. Communications.
 3. As-installed color coded wiring diagrams.
 4. Operating procedures:
 - a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Special operating instructions.
 5. Maintenance procedures:
 - a. Routine operations.
 - b. Guide to "troubleshooting."
 - c. Disassembly, repair and reassembly.
 - d. Adjustment and checking.
 6. MANUFACTURER'S printed operating and maintenance instructions.
 7. List of original MANUFACTURER'S spare parts,

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MANUFACTURER'S current prices, and recommended quantities to be maintained in storage.

8. Other data as required under pertinent sections of specifications.
- D. Prepare and include additional data when the need for such data becomes apparent during instruction of OWNER'S personnel.
- E. Additional requirements for operating and maintenance data: Respective sections of Specifications.
- F. The acceptance of the Operation and Maintenance (O&M) Manual will also require successful completion of the attached O&M review checklist.

1.6 SUBMITTAL SCHEDULE

- A. Submit three (3) copies of preliminary draft of proposed formats and outlines of contents of Operation and Maintenance Manuals within 60 days after Notice to Proceed.
 1. The ENGINEER will review the preliminary draft and return one copy with comments.
- B. As specified in Section 01100, the CONTRACTOR shall submit operating and maintenance data within 60 days of shop drawing approval for each piece of equipment. No later than 60 days following the ENGINEER'S approval of the last shop drawing for material to be included in the Operation and Maintenance Data Manuals, submit three (3) bound volumes of all completed data for review. One (1) copy will be returned with comments to be incorporated into final copies.
- C. Submit specified number of copies of approved data in final form directly to the offices of the ENGINEER, within 30 calendar days of product shipment to the project site and preferably within 30 days after the reviewed copy is received. Final approved copies shall be delivered to the ENGINEER prior to OWNER'S personnel instruction, start-up and acceptance by the OWNER.
- D. Submit five (5) copies of addendum to the Operating and Maintenance Manual as applicable and certificates within 30 days after start-up test and acceptance test.

1.7 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to final inspection or acceptance, fully instruct OWNER'S designated operating and maintenance personnel in operation, adjustment and maintenance of products, equipment and systems, at agreed upon times. The CONTRACTOR shall have instructions video taped while they are

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being given to OWNER's personnel. Videotaping shall be performed by a person or organization experienced in the production of tapes and shall include the entire instruction session(s) and all questions and answers. Two (2) copies of all instructional tapes shall become the property of the OWNER.

- B. Operating and maintenance manual shall constitute the basis of instruction.
 - 1. Review contents of manual with personnel in full detail to explain all aspects of operation and maintenance.
- C. Two weeks prior to the scheduled vendor's training, a detailed lesson plan shall be submitted to the ENGINEER for approval which is representative of the material to be covered during the training period.
- D. The acceptance of the manufacturer's training will be in accordance with the successful completion of the attached MANUFACTURER'S Training Summary Report. This checklist will be completed by the OWNER and ENGINEER at the completion of each vendor training session.

PART 2 – PRODUCTS
(Not Applicable)

PART 3 – EXECUTION
(Not Applicable)

O&M REVIEW CHECKLIST

GENERAL DATA

- 1. _____ Is the area representative's name, address, and phone number included?
- 2. _____ Is the nameplate data for each component included?
- 3. _____ Are all associated components related to the specific equipment included?
- 4. _____ Is non-pertinent data crossed out or deleted?
- 5. _____ Are drawings neatly folded and/or inserted into packets?

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6. _____ Is an overview description of the equipment and/or process included?
7. _____ Does the description include the practical theory of operation?
8. _____ Does each equipment component include specific details (design characteristics, operating parameters, control descriptions, and selector switch positions and functions)?
9. _____ Are alarm and shutdown conditions clearly identified?
10. _____ Are step procedures for starting, stopping, and troubleshooting the equipment included?
11. _____ Is a list of operational parameters to monitor and record for specific equipment included?
12. _____ Is a proposed operating log sheet included?
13. _____ Is a spare parts inventory list included for each component?
14. _____ Is a lubrication schedule for each component included - or does it clearly state "NO Lubrication Required"?
15. _____ Is a maintenance schedule for each component included?

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COMMENTS

Fully Approved:

The following points of rejection require resubmittal by the CONTRACTOR:

Reviewed By: _____

LEGEND

- 1 = OK
- 2 = Not Adequate
- 3 = Not Included

Note: This submittal has been reviewed for compliance with the Contract Specifications and Addendum.

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MANUFACTURER'S TRAINING SUMMARY REPORT

Date: _____

Vendor: _____

Equipment: _____

Name of Representative: _____

1. Was representative prepared? _____
2. Was an overview description presented? _____
3. Were specific details presented for the system components?

4. Were alarm and shutdown conditions clearly presented?

5. Were step procedures for starting, stopping, and trouble shooting the respective system presented?

6. Were routine and preventive maintenance items clearly identified? This should include a lubrication schedule.

7. Did the representative present the information in a logical fashion?

8. Was the representative able to answer all questions?

9. Did the representative agree to research and answer unanswered questions?

10. Was the Owner satisfied with the training session?

Comments:

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END OF SECTION 01730

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SECTION 01740 - WARRANTIES AND BONDS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including MANUFACTURER'S standard warranties on products and special warranties.

1.2 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related requirements:
 - 1. Refer to Conditions of the Contract and Section 01100 for the general requirements relating to warranties and bonds.
 - 2. General closeout requirements are included in Section 01705 Project Closeout.
 - 3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of Divisions 2 through 11.

1.3 SUBMITTALS

- A. Submit written warranties to the ENGINEER for review and transmittal to OWNER prior to the date fixed for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the OWNER.
- B. When a designated portion of the Work is completed and occupied or used by the OWNER, by separate agreement with the CONTRACTOR during the construction period, submit properly executed warranties to the OWNER within fifteen days of completion of that designated portion of the Work.
- C. When a special warranty is required to be executed by the CONTRACTOR, or the CONTRACTOR and a subcontractor, supplier or MANUFACTURER, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the OWNER for approval prior to final execution.
- D. Refer to individual Sections of Divisions 2 through 11 for specific content

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requirements, and particular requirements for submittal of special warranties.

1.4 WARRANTY REQUIREMENT

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The CONTRACTOR is responsible for the cost of replacing or rebuilding defective Work regardless of whether the OWNER has benefited from use of the Work through a portion of its anticipated useful service life.
- D. OWNER's Recourse: Written warranties made to the OWNER are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the OWNER can enforce such other duties, obligations, rights, or remedies.
- E. Rejection of Warranties: The OWNER reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- F. The OWNER reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- G. Disclaimers and Limitations: MANUFACTURER'S disclaimers and limitations on product warranties do not relieve the CONTRACTOR of the warranty on the Work that incorporates the products, nor does it relieve suppliers, MANUFACTURERS, and subcontractors required to countersign special warranties with the CONTRACTOR.

1.5 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.

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- B. Format:
 - 1. Size 8 1/2-inches x 11-inches, punch sheets for standard three post binder.
 - a. Fold larger sheets to fit into binders.
 - 2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS." List:
 - a. Title of Project
 - b. Name of Contractor
 - 3. Electronic format as defined in Section 01300.
- C. Binders: Commercial quality, three-post binder, with durable and cleanable plastic covers and maximum post width of 2-inches.

1.6 DEFINITIONS

- A. Standard Product Warranties are preprinted written warranties published by individual MANUFACTURERS for particular products and are specifically endorsed by the MANUFACTURER to the OWNER.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the OWNER.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

(Not Applicable)

END OF SECTION 01740

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SECTION 02110 - SITE CLEARING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Special Conditions, apply to work of this section.

1.2 DESCRIPTION OF WORK:

- A. Extent of site clearing is shown on drawings. Site clearing work includes, but is not limited to:
 - 1. Protection of existing trees.
 - 2. Removal of trees and other vegetation.
 - 3. Topsoil stripping.
 - 4. Clearing and grubbing.
 - 5. Removing above-grade improvements.
 - 6. Removing below-grade improvements.

1.3 JOB CONDITIONS:

- A. Traffic: Conduct site clearing operations 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.
- B. Protection of Existing Improvements: Provide protection necessary to prevent damage to existing improvements indicated to remain in place.
 - 1. Protection improvements on adjoining properties and on Owner's property.
 - 2. Restore damaged improvements to their original condition, as acceptable to parties having jurisdiction.
- C. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing.

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- D. Salvable Improvements: Carefully remove items indicated to be salvaged, and store on Owner's premises where indicated or directed.

PART 2 – PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.1 SITE CLEARING:

- A. General: Remove trees, shrubs, grass and other vegetation, improvements, or obstructions interfering with installation of new construction. Remove such items elsewhere on the site or premises as specifically indicated. Removal includes digging out stumps and roots.
 - 1. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction.
- B. Topsoil: Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4". Satisfactory topsoil is reasonably free of topsoil, clay lumps, stones, and other objects over 2" in diameter, and without weeds, roots, and other objectionable material.
 - 1. Remove heavy growths of grass from areas before stripping.
 - 2. Where trees are indicated to be left standing, stop topsoil stripping a sufficient distance to prevent damage to main root system.
 - 3. Stockpile topsoil in storage piles in areas shown, or where directed. Construct storage piles to freely drain surface water. Cover storage piles if required to prevent wind-blown dust.
 - 4. Dispose of unsuitable or excess topsoil same as waste material, herein specified.
- C. Clearing and Grubbing: Clear site of trees, shrubs and other vegetation, except for those indicated to be left standing.
 - 1. Completely remove stumps, roots, and other debris protruding through the ground surface.
 - 2. Use only hand methods for grubbing inside drip line of trees indicated to be left standing.

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3. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
 4. Place fill material in horizontal layers not exceeding 6" loose depth, and thoroughly compact to a density equal to adjacent original ground.
- D. Removal of Improvements: Remove existing above-grade and below-grade improvements necessary to permit construction, and other work as indicated.

3.2 DISPOSAL OF WASTE MATERIALS:

- A. Burning on Owner's Property: Burning is not permitted on Owner's property unless Owner's approval is obtained and proper authorities are notified.
- B. Removal from Owner's Property: Remove waste materials and unsuitable materials from Owner's property and dispose of off site in legal manner.

END OF SECTION 02110

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SECTION 02200- EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions, and geotechnical engineering report apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Definition: "Excavation" consists of removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed.

1.3 QUALITY ASSURANCE

- A. Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
- B. Testing and Inspection Service: Employ, at Contractor's expense, a testing laboratory subject to approval by the Engineer to perform soil testing and inspection service for quality control during earthwork operations.
- C. Execution: Perform all work in strict accordance with the recommendations provided in the geotechnical report. For any conflicts between provisions of this Section and the geotechnical report, the geotechnical report shall control.

1.4 SUBMITTALS

- A. Test Reports-Excavating: Submit following reports directly to Engineer from the testing services; with copy to Contractor:
 - B. Test reports on fill material. (Modified Proctor Tests)
 - C. Field density test reports. (Modified Proctor Tests)
 - D. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.

1.5 JOB CONDITIONS

- A. Existing Utilities: Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
 - 1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Contractor shall bear all costs of repairing damaged utilities to the satisfaction of utility owner.
 - 2. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by Engineer and then only after acceptable temporary utility services have been provided.
 - 3. Provide minimum of 48-hour notice to engineer, and receive notice to proceed before interrupting any utility.
 - 4. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.
- B. Use of explosives: The use of explosives is not permitted.
- C. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
 - 1. Operate warning lights as recommended by authorities having jurisdiction.
 - 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damages caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 - 3. Perform excavation within drip-line of large trees to remain by hand, and protect the root system from damage or dryout in the manner prescribed in sections under "Sitework".

PART 2 - PRODUCTS

2.1 SOILS MATERIALS

- A. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand.
- B. Backfill and Fill Materials: Satisfactory soil materials free of clay, rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter. The fill material should be sand containing little fines. Prior to placing the fill material, the existing material shall be stripped of all soils containing a significant percentage of organics and all loose soils which cannot be readily compacted. If existing materials do not meet these requirements, it

may be necessary to backfill with select materials other than those on the job site.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Excavation is Unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
 - 1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be at Contractor's expense.
 - 2. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom of elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Engineer.
 - 3. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classifications, unless otherwise directed by engineer.

- B. Additional Excavation: When excavation has reached required subgrade elevations, notify Engineer who will make an inspection of conditions.
 - 1. If unsuitable bearing materials are encountered at required subgrade elevations, notify Engineer who will make an inspection of conditions.
 - 2. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by the Engineer.
 - 3. Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.

- C. Stability of Excavations: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
 - 1. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

- D. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition.
 - 1. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction.
 - 2. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.

- E. Dewatering: Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area. The cost of all dewatering operations including well pointing shall be the responsibility of the Contractor.
1. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
 2. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.
- F. Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.
1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
 2. Dispose of excess soil material and waste materials as herein specified.
- G. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10', and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of service, other construction, and for inspection.
1. In excavating for footings
 2. and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is places. Trim bottoms to required lines and grades to leave solid base to receive other work.
- H. Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide 6" to 9" clearance on both sides of pipe or conduit and a maximum of 30" total width.
1. Excavate trenches to depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations. Beyond building perimeter, keep bottoms of trenches sufficiently below finish grade to avoid freeze-ups.
 2. Where rock is encountered, carry excavation 6" below required elevation and backfill with a 6" layer of crushed stone or gravel prior to installation of pipe.
 3. For pipes or conduit 5" or less in nominal size and for flat-bottomed multiple-duct conduit units, do not excavate beyond indicated depths. Hand excavate bottom cuts to accurate elevations and support pipe or conduit on undisturbed soil.

4. For pipes or conduit 6" or larger in nominal size, tanks and other mechanical/electrical work indicated to receive subbase, excavate to subbase depth indicated, or, if not otherwise indicated, to 6" below bottom of work to be supported.
5. Except as otherwise indicated, excavate for waterbearing piping so top of piping is not less than 3'-0" below finished pavement grade, but no less than 2'-6" below finish grade.
6. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.
7. Backfill trenches with concrete where trench excavations pass within 18" of column or wall footings and which are carried below bottom of such footings, or which pass under wall footings. Place concrete to level of bottom of adjacent footing.
8. Use care in backfilling to avoid damage or displacement of pipe systems.

3.2 COMPACTION

- A. General: Control soil compaction during construction, providing minimum percentage of density specified for each area classification indicated below.
 1. All compaction requirements for this section are specified on the construction plans.
- B. Moisture Control: Where subgrade of layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during subsequent to compaction operations.
 1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
 2. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by dicing, harrowing or pulverizing, until moisture content is reduced to a satisfactory value.

3.3 BACKFILL AND FILL

- A. General: Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below:
 1. In excavations, use satisfactory excavated or borrow material.
- B. Under grassed areas, use satisfactory excavated or borrow material.
- C. Under walks and pavements, use subbase material, or satisfactory excavated or borrow material, or combination of both.
- D. Under piping and conduit, use subbase material where subbase is indicated under piping or conduit; shape to fit bottom 90 degrees of cylinder.

1. Backfill excavation as promptly as work permits, but not until completion of the following:
 2. Acceptance of construction below finish grade.
 3. Inspection, testing, approval, and recording locations of underground utilities.
 4. Removal of concrete formwork.
 5. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
 6. Removal of trash and debris.
 7. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
 8. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
 9. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break-up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.
 10. Placement and Compaction: The lower portion of backfill, to a compacted level of one foot above the top of the pipe, shall be hand placed in layers of lifts not to exceed six inches of compacted depth and each layer compacted individually by means of hand tampers. Above that level, place lifts in layers not to exceed twelve inches of compacted depth and machine filling and tamping may be used.
 11. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each lift to required percentage of minimum soil density for each area classification as designated herein.
 12. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 13. Place backfill and fill materials evenly adjacent to structures, piping or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.
- E. For structures, follow recommendations indicated in the geotechnical engineering report in the Appendix of these specifications.
- F. For structures to be abandoned and backfilled, maintain groundwater at least 2 feet below the bottom of the structure. At a minimum, compact select fill (Unified Soil Classification SP, SP-SM, SW or SW-SM) material within the existing structures to be abandoned to at least 95% of the Modified Proctor soil density (ASTM D-1557) in 12-inch lifts using hand-operated equipment. Soil

moisture content shall be maintained within 3 percent of optimum. Test on 2 feet increments for verification.

3.4 GRADING

- A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
- B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding.
- C. Finish surfaces free from irregular surface changes, and as follows:
- D. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10' above or below required subgrade elevations.
- E. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.
- F. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 1/2" above or below required subgrade elevations.
- G. Grading Surface of Fill Under Building Slabs: Grade smooth and even, free from voids, compacted as specified, and to required elevation.
 - 1. Provide final grades within a tolerance of 1/2" when tested with a 10' straightedge.
- H. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage for each area classification.

3.5 FIELD QUALITY CONTROL

- A. Quality Control Testing During Construction: Provide and pay for testing service by a qualified soil testing firm, subject to Engineer's approval, to inspect and approve subgrades and fill layers before further construction work is performed.
- B. Paved Areas: Make at least one field density test of subgrade for every 2000 square feet of paved area but in no case less than 3 tests, nor less than 1 per driveway or crossing. In each compacted fill layer, make one field density test for every 2,000 square feet of paved area but in no case less than 3 tests, nor less than 1 per driveway or crossing.

- C. Non-Paved Areas: Perform at least 1 field density test per 3,000 square feet of fill per every vertical foot of height, and perform at least 1 field density test per 1,000 feet of pipe installed per every 2 feet of vertical trench depth.
- D. If in opinion of Engineer, based on testing service reports and inspection, subgrade or fills which have been placed below are specified density, provide additional compaction and testing at no additional expense.

3.6 MAINTENANCE

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.
- D. Grassed Areas: See Section 02210, "Grassing" for requirements of grassed areas.

3.7 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Disposal of all spoil material resulting from construction shall be the responsibility of the Contractor.

END OF SECTION 02200

SECTION 02210 - GRASSING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Special Conditions, apply to work of this section.

1.2 DESCRIPTION OF WORK:

- A. Extent of grassing work is as specified or shown on the construction plans. All other areas disturbed during construction operations shall be seeded.

1.3 QUALITY ASSURANCE:

- A. All seed used shall be labeled in accordance with U. S. Department of Agriculture Rules and Regulations under the Federal Seed Act in effect on the date of invitation for bids. All seed shall be furnished in sealed standard containers, unless exception is granted in writing by Owner. Seed which has become wet, moldy, or otherwise damaged in transit or in storage shall not be used. Fertilizer shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, shall not be used. Seed, fertilizer and other grassing materials shall be stored under cover and protected from damage which would make them unacceptable for use.

1.4 SUBMITTALS:

- A. Approvals, except those required for field installations, field applications, and field tests shall be obtained before delivery of materials or equipment to the project. The results of laboratory tests performed on the topsoil material shall be submitted. The reports shall include the pH level, the amount of organic matter, and available phosphoric acid and potash of the soil intended for use in the work. Certificate of conformance will be required for the following:
 - 1. Grass seed shall be certified by registered, certified seed association or a registered testing laboratory not more than ten months prior to seeding.
 - 2. Sprigs
 - 3. Fertilizer
 - 4. Topsoil

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- 5. Lime
- 6. Mulching

PART 2 - PRODUCTS

2.1 TOPSOIL:

- A. If the quantity of existing stored or excavated topsoil is inadequate for planting, sufficient additional topsoil shall be furnished. Topsoil furnished shall be a natural, fertile, friable soil, possessing characteristics of representative productive soils in the vicinity. It shall be obtained from naturally well-drained areas. Topsoil shall be without admixture of subsoil and free from Johnson grass (*Sorghum halepense*), nut grass (*Cyperus rotundus*) and objectionable weeds and toxic substances.

2.2 SOIL AMENDMENTS:

- A. Lime: Ground Limestone (Dolomite) containing not less than 85 percent of total carbonates, and shall be ground to such a fineness that 50 percent will pass a 100-mesh sieve and 90 percent will pass a 20-mesh sieve.
- B. Fertilizer: 16-16-16 formulation of which 60 percent of the nitrogen is in the urea-formaldehyde form and shall conform to the applicable State Fertilizer laws. It shall be granulated so that 80 percent is held on a 16-mesh screen, uniform in composition, dry and free-flowing.
- C. Mulch: Clean hay or fresh straw.

2.3 GRASS MATERIALS:

- A. Grass Seed: Federal Specifications JJJ-S-181 and shall satisfy the following requirements:

<u>Seed</u>	<u>Min. % Pure Seed</u>	<u>Min. % Germination and Hard Seed</u>	<u>Max % Weed Seed</u>
Bermuda Grass (<i>Cynodon Dactylan</i>)	.25%	80%	15%

- B. Seed failing to meet the purity or germination requirements by no more than twenty-five percent may be used, but the quantity shall be increased to yield the required rate of pure live seed. Seed failing to meet the weed seed requirements shall not be used.

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PART 3 - EXECUTION

3.1 GRADING:

- A. Areas to be grassed shall be graded to remove depressions, undulations, and irregularities in the surface before grassing.

3.2 PLACING TOPSOIL:

- A. Areas to be grassed shall have a minimum topsoil cover of two inches. Topsoil shall not be placed when the sub-grade is excessively wet, extremely dry or in a condition otherwise detrimental to the proposed planting or proper grading.

3.3 TILLAGE:

- A. The area to be grassed shall be thoroughly tilled to a depth of four inches using a plow and disc harrow or rotary tilling machinery until a suitable bed has been prepared and no clods or clumps remain larger than 1-1/2 inches in diameter.

3.4 APPLICATION OF LIME:

- A. The pH of the soil shall be determined. If the pH is below 5.0, sufficient lime shall be added to provide a pH between 5.5 and 6.5. The lime shall be thoroughly incorporated into the top three to four inches of the soil. Lime and fertilizer may be applied in one operation.

3.5 APPLICATION OF FERTILIZER:

- A. Fertilizer shall be applied at the rate of 6 pounds per 1,000 square feet and shall be thoroughly incorporated into the top three to four inches of soil.

3.6 PLANTING SOIL:

- A. All areas disturbed during construction shall be seeded as specified herein. Immediately before seeds are sown and after fertilizer and lime are applied, the ground shall be scarified as necessary and shall be raked until the surface is smooth, friable, and of uniformly fine texture. Areas to be grassed shall be seeded evenly with a mechanical spreader, raked lightly, rolled with a 200-pound roller, and watered with a fine spray.
 - 1. Seed shall be applied at the following rate:

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<u>Seed</u>	<u>Rate of Application</u>
Bermuda Grass (Cynodon Dactylan)	6 lbs./1000 sq. ft. 260 lbs./acre

2. Seeded areas shall be mulched at the rate of not less than 1-1/2" loose measurement over all seeded areas. Spread by hand, blower, or other suitable equipment. Mulch shall be cut into the soil with equipment capable of cutting the mulch uniformly into the soil. Mulching shall be done within 24 hours of the time seeding is completed. All seeded areas shall be mulched, no exceptions. Hydro-seed must also be mulched.

3.7 ROLLING:

- A. After seeding and mulching, a cultipacker, traffic roller, or other suitable equipment shall be used for rolling the grassed areas. Areas shall then be watered with a fine spray.

3.8 WINTER COVER:

- A. All areas to be grassed shall be protected against erosion at all times. For protection during winter months (November 1st through March 31st) Italian rye grass shall be planted at the rate of four pounds per 1,000 square feet on all areas which are not protected by permanent grass. This does not alleviate the contractor from the required seeding.

3.9 CLEAN-UP:

- A. All excess soil, excess grass materials, stones, and other waste shall be removed from the site daily and not allowed to accumulate.

3.10 MAINTENANCE:

- A. Maintenance shall begin immediately following the last operation of grassing and continue until final acceptance. Maintenance shall include watering, mowing, replanting, and all other work necessary to produce a uniform stand of grass. Grassing will be considered for final acceptance when the permanent grass is healthy and growing on 97 percent of the area with no bare areas wider than 12 inches.

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3.11 ACCEPTANCE:

- A. The Contractor shall submit to the Owner two copies of a written request for final acceptance of the grassing work. The request shall be submitted at least ten days prior to the anticipated date of acceptance. The condition of the grass will be noted, the Contractor will be notified if maintenance is to continue.

END OF SECTION 02210

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SECTION 02221 - EARTH EXCAVATION AND BACKFILL IN TRENCHES

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This section includes trenching for the installation of pipelines and appurtenances, including excavation, backfilling, dewatering, disposal of surplus material and restoration of trench surfaces.
- B. Trench excavations shall extend to the widths and depths shown on the contract drawings. In all cases, side slopes during trench excavation shall comply with O.S.H.A. Safety Standards.
- C. The Contractor shall furnish and place all sheeting, bracing, and supports as necessary and shall remove from the excavation all materials which are unsuitable for backfill or which the Engineer may deem unsuitable for backfilling. The bottom of the excavation shall be firm and the Contractor shall furnish and place crushed stone or shell as necessary to stabilize the trench bottom.
- D. The Owner shall have the option to receive all excess excavated material. The Contractor shall be responsible for delivering excess excavated material to a remote site, chosen by the Owner, within a fifteen mile radius of the construction site. All cost associated with transferring the excess excavated material shall be included in the applicable lump sum price. Should Owner not choose to receive any excavated material, the Contractor shall dispose of said material at no additional cost to Owner.
- E. All work shall be performed in strict accordance with the recommendations and criteria indicated in the geotechnical engineering report.

PART 2 - PRODUCTS

2.1 PIPE BEDDING MATERIAL

- A. Crushed stone shall consist of hard, durable, subangular particles of proper size and gradation, and shall be free from organic material, wood trash, sand, loam clay, excess fines, and other deleterious materials. The stone shall be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
5/8-inch	100

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1/2-inch	40 - 100
3/8-inch	15 - 45
No. 10	0 - 5

- B. Sand for bedding pipe shall be a dry screened sand. Sand shall be graded with 100 percent passing a 3/8-inch sieve and not more than 15 percent passing a No. 200 sieve.
- C. Washed shell used for stabilization and bedding shall be mollusk shell in accordance with F.D.O.T. Specifications, Section 913, "Shell Material".

PART 3 - EXECUTION

3.1 EXCAVATION

- A. All excavation shall be unclassified regardless of material encountered. Excavation shall be open cuts with safe side slopes, unless in special cases the Engineer permits vertical sides. In all cases, Contractor shall comply with O.S.H.A. safety standards for safe side slopes during trench excavations.
- B. Where muck, rock, clay or other material within the limits of construction is, in the opinion of the Engineer, unsuitable in its original position, the Contractor shall excavate such material and backfill the excavated area with suitable materials approved by the Engineer, which shall be compacted and shaped to conform to the required section. No separate payment will be made for this item.
- C. In case the excavation of any pipeline is carried below the required depth, the Contractor shall fill the bottom of the excavation up to grade with crushed stone or washed stone in a manner acceptable to the Engineer, without additional compensation for either the excavation or the backfilling.
- D. All material excavated shall be placed so as to minimize interference with public travel or damage to private property and to permit proper access for inspection of the work.
- E. Prior to the start of construction, the Contractor shall provide complete details of the proposed method to be used for the removal of rock or other dense material. Rock shall be removed to a minimum depth of 6-inches below the invert of the pipe or structure and refill material shall be furnished, installed and compacted for pipe or structure bedding as necessary. All costs for removal and refills shall be included in the prices bid for linear feet of force main, sewers, water mains, storm sewers and other piping systems. No additional compensation will be provided for removal or refills.

3.2 DISPOSAL OF MATERIALS

- A. Excavated material shall be stacked without excessive surcharge on the trench bank or obstructing free access to hydrants and valves. Inconvenience to traffic and abutters shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.
- B. All excavated material which is either unsuitable for backfill or which will not be used for backfill in the same location (i.e. streets) shall be removed from the site of the work by the Contractor. All rock excavated with any dimension in excess of 6-inches shall be considered unsuitable material and shall be removed from the project site. The Contractor shall include all costs for removal and disposal of unsuitable material and the required backfill material in the unit prices bid for pipe. No additional compensation will be provided for this item.
- C. Should conditions make it impracticable or unsafe to stack material adjacent to the trench, the material shall be hauled and stored at a location provided by the Contractor. When required, it shall be rehandled and used in backfilling the trench.

3.3 SHEETING AND BRACING

- A. Protection of the excavation against caving or settling of the banks shall be the sole responsibility of the Contractor. He shall protect the sides of his excavation by sheeting and bracing as may be necessary. No actions or instructions by the Engineer shall be regarded as the responsibility for security of the trench or the surrounding areas. The full responsibility remains with the Contractor. The Contractor shall furnish, put in place, and maintain sheeting and bracing required to support the side of the excavation and prevent loss of ground which could damage or delay the work or endanger adjacent structures or vehicular traffic. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports placed at the expense of the Contractor. Compliance with such order shall not relieve the Contractor from his responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.
- B. The Contractor shall leave in place to be imbedded in the backfill of the trench, all wood sheeting, bracing, and other related items as shown on the drawings, or which the Engineer may direct him in writing to leave in place at any time during the progress of the work for the purpose of preventing injury to structures, utilities, or property, whether public or private. The Engineer

may direct that timber used for sheeting and bracing in the trench be cut off at any specified elevation, after backfilling and tamping has reached this level.

- C. All sheeting and bracing not left in place shall be carefully removed in such manner as not to endanger the construction of other structures, utilities, or property, whether public or private.
- D. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his part to issue such orders, and his failure to exercise his right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place.
- E. The Contractor shall receive no payment, other than that included in the price to be paid for pipe, for any extra materials used for sheeting, bracing, and other related items. The Contractor shall receive no payment for such materials which was used for the convenience of the Contractor. No separate payment will be made for sheeting, shoring and bracing and the costs shall be included in the appropriate bid item(s).

3.4 DEWATERING

- A. The Contractor shall furnish all materials and equipment necessary and perform all incidental work required to install and maintain a dewatering system for handling ground water or surface water encountered. The Contractor shall assume all responsibility for the adequacy of the methods, materials, and equipment employed. Construction shall not begin until the Engineer is assured that the proposed method will be satisfactory. The requirements for a stable sub-grade are indicated above and the Contractor must alter his drainage methods, if in the opinion of the Engineer, the trench bottom is unsatisfactory.
- B. The Contractor shall provide pumping equipment and dewatering devices to properly remove and dispose of all water entering trenches and excavations. The grade shall be maintained acceptably dry until the structures to be built therein are completed. All drainage shall be performed without damage to the trench, pavements, pipes, electrical conduits, or other utilities.
- C. The Contractor shall prevent floatation of the pipe by promptly placing and compacting backfill prior to removing any dewatering equipment.

- D. All costs for dewatering systems shall be included in the pipe unit price. No additional compensation will be provided.

3.5 BACKFILLING

- A. As soon as practicable after the pipe has been laid, backfilling shall begin. Bedding shall conform to the details on the drawings. When laying pipe, the groove for the pipe and bell hole must be accurately shaped, and the backfill must be closely compacted under and around the pipe.
- B. Density tests will be taken as determined by the Engineer to establish control of Contractor's backfill operations. Contractor shall pay the cost of density tests. Contractor shall pay all costs involved in retesting areas that fail. At a minimum, one compaction test location shall be required for each 300 linear feet of pipe trench and for each 100 square feet of backfill around structures (measured at the top of bank of the excavation). These test requirements are minimum and may be increased at the engineer's discretion should additional testing be warranted to confirm conformance with the intent of the contract documents.
- C. Each location of compaction testing within the trench shall be in accordance with the following schedule:
 - 1. One test at the spring line of the pipe.
 - 2. One test at an elevation of one foot above the top of the pipe.
 - 3. One test for each two feet of backfill placed from one foot above the top of pipe to finished grade.
- D. Compaction testing at each structure shall be in accordance with the following schedule:
 - 1. One test at the base of the structure.
 - 2. One test for each 12" lift of backfill, with varied locations around the perimeter of the structure.
- E. Bedding and backfill material shall be compacted to a density of not less than 98% of the maximum density as determined by AASHTO T-180 unless otherwise noted on the plans. Pipe bedding material shall be clean sand, crushed stone or washed shell as specified. Bedding material shall be placed to the width and height dimensions as shown in the bedding detail on the contract drawings
- F. After the required bedding has been placed as shown on the drawings,

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backfill material free from stones, pieces of lumber, rock and other foreign material shall be placed and compacted over the top of the pipe to a depth of 1 foot above the pipe crown.

- G. Sand for bedding when required shall be placed 6-inches below the invert to a point 8-inches above the crown of the pipe.
- H. Where the pipes are laid cross-country, the remainder of the trench shall be filled with backfill material as shown on the drawings and thoroughly compacted and mounded 6-inches above the existing grade or as directed. Excavated rock with all dimensions less than 6-inches may be used as backfill from 2 feet above the pipe crown to the surface.
- I. Where the pipes are laid in streets, driveways, parking lots, or other areas receiving vehicular traffic, the remainder of the trench above the bedding and the limits stated in Paragraph "B" above and up to within 3 feet of the finish base grade shall be backfilled in 12-inch layers and thoroughly compacted to a density of not less than 98% of the maximum density determined by AASHTO T-180. The top 3 feet shall be compacted to a density of not less than 98% of the maximum density as determined by AASHTO-T-180. Excavated rock with all dimensions less than 6-inches may be used as backfill between the area 2 feet above the pipe crown and the pavement sub-base.
- J. Backfill around manholes and other structures shall be thoroughly compacted to a density of not less than 98% of the maximum density as determined by AASHTO T-180. All backfill shall be compacted, especially under and over pipes connected to manholes.
- K. Concrete or bituminous asphalt removed during excavation shall not be placed in backfill.
- L. All road surfaces adjacent to backfilling operations shall be broomed and hose-cleaned immediately after backfilling. Dust control measures acceptable to the Engineer shall be employed at all times.

3.6 RESTORING TRENCH SURFACE

- A. Where the trench occurs adjacent to paved streets, in shoulders, sidewalks, or in cross-country areas, the Contractor shall thoroughly consolidate the backfill and shall maintain the surface as the work progresses. If settlement takes place, he shall immediately deposit additional fill to restore the level of the ground.
- B. The surface of any driveway or any other area which is disturbed by the

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trench excavation and which is not a part of the paved streets shall be restored by the Contractor to a condition at least equal to that existing prior to construction.

- C. In sections where the pipeline passes through grassed areas, the Contractor shall re-grade and sod all disturbed areas as specified in Section 02960.

3.7 PROTECTION

- A. Guard rails, curbing, fencing and other existing facilities in the vicinity of the Contractor's operations shall be adequately protected, and if necessary removed and restored after backfilling. All curbing, fences, guard rails and other existing facilities which are damaged during construction shall be replaced with material fully equal to that existing prior to construction.

END OF SECTION 02221

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SECTION 02240 – DEWATERING

PART 1 - GENERAL

1.1 FDEP GENERIC DEWATERING DISCHARGE PERMIT

- A. The CONTRACTOR shall be responsible for securing a generic dewatering discharge permit under the requirements of Florida Administrative Code Section 62-621.300.2A) if required.
- B. Should the existing groundwater quality not meet the criteria for the receiving water body, the CONTRACTOR shall either make arrangements with neighboring wastewater utilities to receive dewatering discharge or provide necessary chemicals and treatment required to meet the receiving water quality criteria.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. Section includes construction dewatering.
- B. Related Sections:
 - 1. Division 01 for recording preexisting conditions and dewatering system progress.
 - 2. Division 02 Section "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
 - 3. Division 02 Section "Earth" for excavating and backfilling specifically for trenches.

1.4 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, secure regulatory permits for, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size,

and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

1. Delegated Design: Design dewatering system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
3. Prevent surface water from entering excavations by grading, dikes, or other means.
4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
5. Provide for discharge to receiving water body of quality and quality assurance monitoring required by the dewatering discharge permit.
6. Remove dewatering system when no longer required for construction.

1.5 SUBMITTALS

- A. Shop Drawings: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, treatment, monitoring and disposal of water.
 1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
 2. Include a written plan for dewatering operations including control procedures to be adopted if dewatering problems arise.
- B. Delegated-Design Submittal: For dewatering system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Qualification Data: For qualified Installer and professional engineer.
- D. Field quality-control reports.
- E. Other Informational Submittals:
 1. Photographs or Videography: Show existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.

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1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer that has specialized in design of dewatering systems and dewatering work.
- B. Regulatory Requirements: Comply with governing local city, county, state regulatory agency and EPA notification regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction including, but not limited to, Section 62-621 of the Florida Administrative Code.
- C. Pre-installation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to dewatering including, but not limited to, the following:
 - a. Inspection and discussion of condition of site to be dewatered including coordination with temporary erosion control measures and temporary controls and protections.
 - b. Geotechnical report.
 - c. Proposed site clearing and excavations.
 - d. Existing utilities and subsurface conditions.
 - e. Coordination for interruption, shutoff, capping, and continuation of utility services.
 - f. Construction schedule. Verify availability of Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - g. Testing and monitoring of dewatering system.

1.7 PROJECT CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
 - 1. Notify Owner no fewer than two days in advance of proposed interruption of utility.
 - 2. Do not proceed with interruption of utility without Owner's written permission.
- B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical

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engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for dewatering.
 2. The geotechnical report is included elsewhere in the Project Manual.
- C. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Owner's Representative if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, 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.
- C. Provide temporary grading to facilitate dewatering and control of surface water.

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- D. Monitor dewatering systems continuously.
- E. Promptly repair damages to adjacent facilities caused by dewatering.
- F. Protect and maintain temporary erosion and sedimentation controls during dewatering operations.
- G. At the option of the Contractor, dewatering discharge may be directed to the City's sanitary sewerage system for the portions of the project site where groundwater quality does not meet surface water discharge but only for a period of 29 days for a given area. All other areas where groundwater meets surface water quality discharge shall not be directed to the sanitary sewerage system.

3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
 - 1. Space well points or wells at intervals required to provide sufficient dewatering.
 - 2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
- B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
- C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
 - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
 - 1. Maintain piezometric water level a minimum of 24 inches or that level recommended by the Geotechnical Report below surface of excavation.
- E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to

others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

- F. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.
 - 1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.
- G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

3.3 FIELD QUALITY CONTROL

- A. Observation Wells: Provide, take measurements, and maintain at least the minimum number of observation wells or piezometers indicated in the shop drawings; additional observation wells may be required by authorities having jurisdiction.
 - 1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
 - 2. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
 - 3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.
- B. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.

END OF SECTION 02240

SECTION 02260 - EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes temporary excavation support and protection systems.
- B. Related Sections:
 - 1. Division 1 for recording preexisting conditions and excavation support and protection system progress.
 - 2. Division 1 for temporary utilities and support facilities.
 - 3. Division 2 Section "Dewatering" for dewatering system for excavations.

1.3 PERFORMANCE REQUIREMENTS

- A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.
 - 1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
 - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
 - 4. Monitor vibrations, settlements, and movements.

1.4 SUBMITTALS

- A. Shop Drawings: For excavation support and protection system.

- B. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Qualification Data: For qualified professional engineer.
- D. Other Informational Submittals:
 - 1. Photographs or Videotape: Show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems. Submit before Work begins.
 - 2. Record Drawings: Identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions.
 - a. Note locations and capping depth of wells and well points.

1.5 QUALITY ASSURANCE

- A. Pre-installation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:
 - a. Existing utilities and subsurface conditions.
 - b. Proposed excavations.
 - c. Proposed equipment.
 - d. Monitoring of excavation support and protection system.
 - e. Working area location and stability.
 - f. Coordination with waterproofing.
 - g. Abandonment or removal of excavation support and protection system.
 - h. Insert agenda items.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
 - 1. Notify Owner no fewer than two days in advance of proposed interruption of utility.
 - 2. Do not proceed with interruption of utility without Owner's written permission.

- B. Project-Site Information: A geotechnical report has been prepared for this Project.
- C. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
 - 1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Engineer if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide materials that are either new or in serviceable condition.
- B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992 / A 992M.
- C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690 / A 690M; with continuous interlocks.
 - 1. Corners: Site-fabricated mechanical interlock.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 - 1. Shore, support, and protect utilities encountered.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, 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.

- C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.
- D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.
- E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 SHEET PILING

- A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

3.3 BRACING

- A. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.
 - 1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Engineer.
 - 2. Install internal bracing, if required, to prevent spreading or distortion of braced frames.
 - 3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.4 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlaying construction and abandon remainder where the Contractor elects to abandon in place. Notify the Engineer and Owner in writing at such time abandonment in place is deemed necessary and the underlying facts and reasons supporting abandonment. The Owner reserves the right to disapprove abandonment if future construction issues, congestion of utilities, or future expansion costs are considered damages to the Owner.
2. Fill voids immediately with approved backfill compacted to density specified in Division 2 Section "Earthwork."
3. Repair or replace, as approved by Engineer, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION 02260

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SECTION 02575 - PAVEMENT REPAIR, RESTORATION & ASPHALT OVERLAY

PART 1 - GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, equipment and incidentals required and remove and replace pavement over trenches excavated for installation of piping and appurtenances and construct overlay as provided for in the Contract Documents and/or directed by the engineer.

1.2 GENERAL

- A. Refer to Section 01380 relative to photographs required prior to construction.
- B. All damage, as a result of work under this project, done to existing pavement, driveways, paved areas and including all obstructions not specifically named herein, shall be repaired in a manner satisfactory to the Engineer. All damage to existing facilities shall be repaired by the Contractor at his expense unless pay items for specific types of repair are included in the Proposal.
- C. The Contractor shall keep the surface of the backfilled area of excavation in a safe condition and level with the remaining pavement until the pavement is restored in the manner specified herein. All surface irregularities that are dangerous or obstructive to traffic are to be removed.
- D. All materials and workmanship shall be first class and nothing herein shall be construed as to relieve the Contractor from this responsibility. The Owner reserves the right to require soil borings or loading tests or materials tests, should the adequacy of the foundation or the quality of materials used be questionable. Costs of all tests shall be borne by the Contractor. All retests shall be paid for by the Contractor.
- E. All street, road and highway repair shall be made in accordance with the applicable requirements of the contract documents and meeting the approval of Panama City Beach, Bay County and FDOT (as applicable).
- F. No permanent pavement shall be placed over a backfilled trench until satisfactory density tests are obtained and submitted to the Engineer. In addition, all pressure tests, leakage tests and visual inspections shall be

completed and approved.

PART 2 - PRODUCTS

2.1 PAVEMENT RESTORATION

A. Asphaltic Concrete:

Asphaltic concrete for new pavement and overlay shall consist of asphalt cement, coarse aggregate, fine aggregate and mineral filler conforming to FDOT specifications for Type S-III Asphalt or Superpave SP 9.5 traffic level C. Total final pavement thickness of the overlay, leveling course, and existing asphalt surface course in no case shall be less than 1-1/2 inches compacted thickness. All asphalt concrete pavement shall be furnished, installed and tested in accordance with FDOT Standard Specification Section 303.

B. Asphaltic Base:

Asphaltic base shall be furnished and installed for all new pavement and pavement restored under this contract. Asphaltic Base shall be ABC-2 mix. Asphalt base shall be placed upon the final graded base prior to leveling course and/or overlay and shall have a compacted minimum thickness of 2 inches. Marshall stability shall be 1000.

C. Base Course

Base course shall be furnished and installed under all pavement sections restored under this contract. Base course shall be placed and compacted as soon as practicable following backfilling of trenches and shall have an interim thickness as required to result in a level and driveable roadway. Base course shall have minimum final compacted thickness(es) in accordance with the contract documents.

2.2 ASPHALTIC OVERLAY COURSE

A Type S-III or Superpave SP 9.5 overlay course shall be constructed as shown on the drawings and directed by the Engineer. The overlay material and construction shall conform to FDOT Standard Specifications Section 333, Section 330 and Section 320. Type FC-3 overlay may be used at specific areas at no additional cost if directed by the Engineer.

2.3 PRIME AND TACK COATS

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- A. Prime and Tack Coats: Prime and tack coats shall be applied to the prepared base material. Prime coat shall be cutback asphalt, Grade RC-70, complying with FDOT Specifications, Articles 300-1 through 300-7, applied at the average rate of 0.15 gallon per square yard.
- B. Tack coat shall be emulsified asphalt, Grade RS-2, complying with FDOT Specifications, Articles 300-1 through 300-7 respectively, applied at the average rate of 0.10 gallon per square yard. The bituminous quantities are considered as average and are subject to some variation at the discretion of the Engineer at no additional cost.

PART 3 - EXECUTION

3.1 CUTTING PAVEMENT

- A. The Contractor shall cut and remove pavement as shown on the drawings for installing the new pipeline and appurtenances and for making connections to existing pipelines.
- B. Before removing pavement, the pavement shall be marked for cuts nearly paralleling pipe lines and existing street lines. Asphalt pavement shall be cut along the markings with a rotary saw or other suitable tool. Concrete pavement shall be scored to a depth of approximately two (2) inches below the surface of the concrete along the marked cuts. Scoring shall be done by use of a rotary saw, after which the pavement may be broken below the scoring with a jackhammer or other suitable equipment.
- C. No pavement shall be machine pulled until completely broken and separated along the marked cuts.
- D. The pavement adjacent to pipeline shall neither be disturbed nor damaged. If the adjacent pavement is disturbed or damaged, irrespective of cause, the Contractor shall remove the damage pavement and shall replace it at his own expense. In addition, the base and sub-base shall be restored in accordance with these specifications and as directed by the Engineer.

3.2 PAVEMENT REPAIR AND REPLACEMENT

- A. All existing pavement that is cut or damaged by construction shall be repaired to match the original grade unless otherwise specified or shown on the drawings. Materials and construction procedures for base course and pavement repair shall conform to those of the Florida Department of Transportation.

- B. The repair shall include the preparation of the sub-base and base, the placing and maintaining of the roadway surface and any special requirements, all as specified herein.
- C. The width of all asphaltic concrete repairs shall extend the full width and length of the excavation or to the limits of any damaged section. However, the maximum payment width shall be 10 feet. The edge of the pavement to be left in place shall be cut to a true edge with a saw or other approved method so as to provide a clean edge to abut the repair. The line of the repair shall be reasonably uniform with no unnecessary irregularities.

3.3 COMPACTED SUBGRADE

All subgrades shall be constructed of granular material. It shall be the Contractor's responsibility to compact and maintain the subgrade until the base and wearing course is constructed.

3.4 PRIME AND TACK COATS

All base courses shall be given a prime and tack coat of the type and rate specified prior to application of the asphaltic concrete surface. Tack coats for hot bituminous courses shall be required between courses. No separate payment shall be made for this item.

3.5 LEVELING AND OVERLAY COURSES

Structural and overlay courses shall be constructed to provide a uniform cross-section and a uniform profile with a maximum tolerance of 1/4-inch per 15 feet. Contractor shall provide and install a leveling course as noted in the plans to ensure that no surface irregularities greater than 1" are present prior to overlay. Roadway crowns shall be constructed or reconstructed as required.

3.6 SPECIAL REQUIREMENTS

- A. The restoration of all surfaces, as described herein, disturbed during the work shall be completed as soon as is reasonable and practical and when directed by the Engineer. All restoration, replacement and repairs outside the payment limits shall be the responsibility of the Contractor and shall be performed without additional compensation. The limits of the asphalt overlay(s) shall be as shown on the drawings and as directed by the Engineer.

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- B. All dirt and shell driveways shall be replaced with shell, 6-inches minimum thickness.

3.7 CLEANUP

- A. After all repair and restoration or paving has been completed, all excess asphalt, dirt, and other debris shall be removed from the roadways. All existing storm sewers and inlets shall be checked and cleaned of any construction debris.

3.8 MAINTENANCE OF REPAIR

- A. All wearing surfaces shall be maintained by the Contractor in good order suitable for traffic prior to completion and acceptance of the work.
- B. All pavement that settles more than 1/4 inch during the warrantee period shall be repaired by the Contractor at no additional cost to the Owner.

END OF SECTION 02575

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SECTION 02577 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Agreement Declarations, Exhibits and other Technical Specification Sections apply to this Section.
- B. Unless otherwise specified on the plan sheets or in other sections of this contract, all materials and work shall conform to the applicable requirements in the following documents:
 - (1) Florida Department of Transportation *Roadway and Traffic Design Standards*, Indices 17344 through 17359 (Latest Edition).
 - (2) Florida Department of Transportation *Standard Specifications for Road and Bridge Construction*, Sections 705, 706, 707, 710, 711, 971, and 993 (Latest Edition).
 - (3) USDOT, Federal Highway Administration *Manual on Uniform Traffic Control Devices for Streets and Highways* (ANSI D6.1e-1989), (Latest Edition).

1.2 DESCRIPTION OF WORK

The work under this section includes the installation of temporary and permanent pavement markings. The Contractor shall furnish all labor, materials, tools, supplies, equipment, and machinery necessary to fully complete the work shown in the plans and in these specifications. Pavement marking notes on plan sheets shall take precedence over and modify conflicting Technical Specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

All materials shall be new and of good quality unless otherwise specified. The Contractor shall, if requested by Engineer, furnish samples of material and/or shall certify that the material meets all FDOT requirements. All material or work which has been rejected shall be remedied by the Contractor at his own expense and without delay. If the Contractor fails to promptly remove and/or dispose of rejected material and replace the same, the Engineer may remove and replace the same and deduct the cost of the work from the contract amount.

2.2 TEMPORARY PAVEMENT MARKINGS

Materials for temporary pavement markings shall meet all requirements of FDOT Specs, Section 710.

2.3 PERMANENT PAVEMENT MARKINGS

Materials for permanent pavement markings shall meet all requirements of FDOT Specs, Section 711.

PART 3 - EXECUTION

3.1 GENERAL

All pavement markings shall be applied in accordance with FDOT Specs requirements.

3.2 TEMPORARY PAVEMENT MARKINGS.

Temporary pavement markings shall be installed at the end of each day on new pavement surfaces and shall be maintained until permanent markings are installed.

3.3 PERMANENT PAVEMENT MARKINGS

Permanent pavement markings, including painted stripes, thermoplastic stripes, and reflective pavement markers, shall be installed as shown in the plans. Materials and installation shall conform to applicable standards in the documents referenced in Section 1.1. Installation of permanent markings on all final asphaltic concrete surfaces shall not be accomplished prior to 14 calendar days, nor later than 30 calendar days, after placement of the final surfaces.

END OF SECTION 02577

SECTION 02619 - DUCTILE IRON PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, equipment, and incidentals required to install ductile iron pipe and fittings complete, tested, and ready for use, as shown on the Drawings and/or as specified herein.
- B. Omission of a specific item or component obviously necessary for the proper function of the system shall not relieve the CONTRACTOR from the responsibility of supplying that specific item or component at no additional expense to the Owner.

1.2 SUBMITTALS

- A. The CONTRACTOR shall submit to the ENGINEER, within twenty (20) calendar days after receipt of Notice to Proceed, a list of materials to be furnished, and the names of the suppliers and the date of delivery of materials to the site.
- B. Submit shop drawings to the ENGINEER for review in accordance with Section 01300, showing the complete laying plan of all pipe, including all fittings, adapters, valves, and specials along with the MANUFACTURER's drawings and specifications indicating complete details of all items. The pipe details shall include a pipe class-laying schedule, which specifies pipe class, class coding, joints, station limits, and transition stations, and a list of abbreviated terms with their full meaning. The CONTRACTOR shall provide details of fittings to be furnished. The above shall be submitted to the ENGINEER for approval before fabrication and shipment of these items. The locations of all pipes shall conform to the locations indicated on the Drawings. In most cases, a certain amount of flexibility in the positioning of pipes will be allowed. Horizontal and vertical deflections may require beveled, special deflection; or short pipes. The deflections at joints shall not exceed 75 percent of that recommended by the MANUFACTURER.
- C. Furnish in duplicate to the ENGINEER, prior to each shipment of pipe, submit MANUFACTURER certifications and certified test reports that the pipe and linings and coating for this contract was manufactured and tested in accordance with the ASTM and ANSI/AWWA Standards specified herein.

1.3 QUALIFICATIONS

All ductile iron pipe and fittings shall be furnished by MANUFACTURER'S who are fully experienced, reputable, and qualified in the manufacturing of the material to be furnished. The pipe and fittings shall be designed, constructed, and installed in accordance with the best practices and methods and shall comply with these Specifications.

1.4 QUALITY ASSURANCE

- A. All ductile-iron pipe and fittings shall be from a single MANUFACTURER. All ductile-iron pipes to be installed under this contract may be inspected at the foundry for compliance with these specifications by an independent testing laboratory provided by the OWNER. The CONTRACTOR shall require the MANUFACTURER's cooperation in these inspections. The cost of foundry inspection of all pipe approved for this contract will be borne by the OWNER.
- B. Inspection of the pipe will also be made by the ENGINEER or other representatives of the OWNER after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the specification requirements, even though pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall immediately be removed from the job.
- C. Each joint of ductile iron pipe shall be hydrostatically tested at the point of manufacture to 500 psi for duration of at least ten (10) seconds. Testing may be performed prior to machining bell and spigot. Failure of ductile iron pipe shall be defined as any rupture of pipe wall. Certified test certificates shall be furnished in duplicate to the ENGINEER prior to time of shipment.

1.5 CONNECTION TO EXISTING LINES

- A. Lines installed under other Contracts, to which piping of this Contract must connect the following work shall be performed:
 - 1. Removing the temporary or permanent plug provided in the pipe installed under another Contract (if any).
 - 2. Furnishing and installing piping and accessories and making proper connections.
- B. For connections to the existing lines to which the piping of this Contract must connect, the following work shall be performed:
 - 1. Exposed buried lines to confirm or determine end connection, pipe material, and diameter.
 - 2. Furnish and install appropriate piping and make proper

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connections.

PART 2 - PRODUCTS

2.1 MATERIALS

The CONTRACTOR shall use the following project specific pressure classes of ductile iron pipe for sizes shown:

<u>Pipe and Fitting Sizes</u>	<u>Pressure Class</u>
4"	350
6"	350
8 "	350
10"	350
12"	350
14"	250
16"	250
18"	250
20"	250
24"	200
30"	150
36"	150

- A. Ductile iron pipe and fittings 3-inches through 54-inches for buried service shall meet the following requirements:
1. Ductile iron pipe shall conform to ANSI A21.51 and AWWA C-151. Ductile iron pipe shall have a minimum tensile strength of 60,000 psi with minimum yield strength of 42,000 psi and a minimum elongation of 10 percent. Type of bedding conditions used shall be as shown on the Drawings.
 2. Unrestrained joint pipe shall be supplied in lengths not in excess of 21 feet. Unrestrained joint pipe shall be the push-on joint pipe. Unrestrained joint pipes for pipe sizes 36" and less shall be American Ductile Iron Fastite® or ENGINEER approved equal,
 3. Unrestrained fittings shall meet the requirements of AWWA C-110. Rubber gaskets shall conform to ANSI A21.11 for all joints. Mechanical joint fittings and restrained joint pipe shall be furnished with sufficient quantities of accessories as required for each joint.
 4. Restrained joint fittings where shown or specified shall be manufactured in accordance with the requirements of ANSI/AWWA C151/A21.51, C110/A21.10 and C111/A21.11. Push-on joints for such pipe shall be in accordance with ANSI/AWWA C111/A21.11. Pipe thickness shall be designed in accordance with ANSI/AWWA C150/A21.50 and C151/A21.51. Restrained joint fittings shall be ductile iron in accordance with applicable requirements of ANSI/AWWA C110/A21.10. Mechanical joints for such fittings shall

be in accordance with ANSI/AWWA C110/A21.10 and C111/A21.11. Restrained joints, where shown or specified, shall be designed to withstand vertical and longitudinal forces and be capable of holding against withdrawal with no axial movement resulting from an internal hydrostatic pressure of 120 psi for the raw sewage force mains and 150 psi for reclaimed water irrigation mains and potable water mains.

5. Restrained pipe joints that achieve restraint by incorporating cut out sections in the wall of the pipe shall have a minimum wall thickness at the point of cut out that corresponds with the minimum specified wall thickness for the rest of the pipe.
6. Restrained joints shall be suitable for 120 psi or 150 psi working pressure for purpose as specified above and fabricated of heavy section ductile iron casting. Gaskets shall meet the material requirements of ANSI/AWWA C111. **Restrained joint pipe and fittings shall be the push-on joint pipe. Restrained joint pipes and fittings for pipe size 30” and less shall be American Ductile Iron Fastite® with Fast-Grip Gasket® or ENGINEER approved equal.** Restrained joint pipe and fittings for pipe size 36” and larger shall be American Ductile Iron Flex-Ring® or ENGINEER approved equal. The minimum number of restrained joints required for resisting forces at fittings and changes in direction of pipe shall be determined from the length of restrained pipe on each side of fittings and changes in direction necessary to develop adequate resisting friction with the soil as shown on the drawings.
7. All *jack and bore* service pipe and fittings 12-inches and greater shall be ductile iron. Unless specified differently on the drawings, all buried service pipe shall have single gasket, compression push-on type line joints. All *jack and bore* fittings shall be mechanical joint. All fittings shall be mechanically restrained with Fast-Grip®, Flex Ring®, or Megalug Series 1100 or ENGINEER approved equal.
8. Ductile iron fittings, valves and other appurtenances shall not be wrapped with polyethylene film.
9. Adapters to connect ductile iron fittings to pipe or fittings of dissimilar materials shall be supplied by the CONTRACTOR in accordance with the pipe MANUFACTURER recommendations and as approved by the ENGINEER.
10. Pipe outlets where shown shall be made with tees, tapping saddles or factory welded-on bosses for above ground piping. Bosses shall be ductile iron, factory welded on ductile iron pipe having a minimum Pressure Class 350 for 6-inch to 12-inch sizes, Pressure Class 250 for 16-inch to 36-inch sizes, and Pressure Class 150 for 42-inch to 48-inch sizes.
11. CONTRACTOR may supply short body ductile iron fittings in

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conformance with AWWA C153 in lieu of C110 and C111 for sizes 3-inch through 36-inch.

12. All fittings shall be cast and machined at one foundry location to assure quality control and test data. The standard grade of iron shall be 70-50-05. Analyses of the ductile iron shall be made with the chemical limits set in this standard (C110 and/or C153). Results of chemical analyses shall be provided to the ENGINEER as part of the shop drawings.
- B. Ductile iron pipe and fittings 3-inches through 54-inches for above ground service or in below ground concrete pits shall meet the following requirements:
1. All above ground ductile iron pipe shall be flanged. Ductile iron pipe shall conform to ANSI A21.51 and AWWA C-151.
 2. Flanged ductile-iron pipe shall conform to current AWWA/ANSI Specification C115/A21.15 and C110/A21.10 with factory-applied screwed long hub flanges except as otherwise specified hereinafter. Flanges shall be fully machined faced and drilled after being screwed tight on the pipe, with flanges true to 90 degrees with the pipe axis and shall be flush with end of pipe conforming to ANSI B161.1, 125 pound std. or Class 250, for the purpose intended. No welding of flanges or accessories in the field will be acceptable.
 3. Pipe for use with split-type flexible coupling joints shall have radius grooved ends.
 4. Wall sleeve with integral water stops, or wall pipe casings with integral thrust collars shall be continuously welded on each side of the waterstop or thrust collar and shall be of the sizes and types as shown on the Drawings. Wall sleeves, where specified, shall be fabricated of Schedule 40 Type 304 stainless steel or PVC and shall have integral water stops continuously welded on each side of the waterstop. Seal strips for wall sleeves, where required on the Drawings, shall be Link Seal as manufactured by Thunderline Corp., Wayne, Michigan, or equal.
 5. Full face type 1/16-inch thick red rubber ring gaskets shall conform to ANSI A21.11. Ring gaskets shall be of approved composition suitable for the required service.
 6. Bolts and nuts on flanged pipe and fittings shall be low alloy, high strength steel equal to "Corten," conforming to ANSI A21.11 and A21.15 or 304 stainless steel and shall be drilled to match ANSI B16.1 Class 125 or 250 flanges for the purpose intended.

2.2 LINING AND COATINGS

- A. All pipe and fittings for potable water service and reclaimed water irrigation reuse mains shall have a cement mortar lining and a bituminous

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seal coat on the inside in accordance with ANSI A21.4 and be coated on the exterior with a 1-2 mils thick bituminous coat in accordance with ANSI A21.51.

- B. All ductile iron pipe and fittings for wastewater service (including but not limited to raw sewage lines, all process lines, and reject water lines) including pressure and gravity mains, unless otherwise noted, shall have a ceramic epoxy lining on the interior and bituminous coating on the exterior except for 6 inches back from the spigot end. The bituminous coating shall not be applied to the first 6 inches of the exterior of the spigot ends. All pipe and fittings shall be delivered to the application facility without asphalt, cement lining, or any other lining on the interior surface. Because removal of old linings may not be possible, the intent of this specification is that the entire interior of the pipe and fittings shall be as cast without ever having been lined with any substance prior to the application of the specified lining. Any pipe or fittings furnished for this project must not have been lined prior to the awarding of the contract for this project.
1. Lining Material - The material used for the lining shall be a two component amine cured epoxy of at least 87 percent solids. Protecto 401 by Vulcan Painters, Birmingham, Alabama or Permite 9043, Type II Glass Filled Epoxy by Permite Corporation, Atlanta, Georgia are the Standards of Quality. The following test requirements shall be certified by the material supplier, and a history of satisfactory performance for the material in the service required and upon the surface specified shall be submitted. The following are the minimum requirements to be met:
 - a. A permeability rating of zero permeance when a film of at least 40 mils is tested according to ASTM D1653 or a permeability rating of 0.0 perms when measured using Method A of ASTM E66 procedure A with a test duration of 42 days.
 - b. The material shall contain at least 20 percent by volume of ceramic quartz pigment in the dried film.
 - c. The following test must be run on ductile iron panels with the results certified by the lining material supplier of the material being submitted.

<u>Test</u>	<u>Rating/Method</u>
1) Direct Impact	ASTM D-2794
2) 3% Sulfuric Acid Immersion @ 120/F	ASTM D-714
3) 25% Sodium Hydroxide Immersion @ 140/ F	ASTM D-714

- 4) Deionized Water ASTM D-714
Immersion @ 160/ F

 - 5) Moisture and Ultraviolet ASTM G-5377
Light Cycle 8 hours light/
4 hours 100% humidity
2. Application of Lining - The lining shall be applied by a competent firm with at least a five-year history of applying linings to the interior of ductile pipe and fittings.
- a. Surface Preparation: Prior to abrasive blasting the entire area which will receive the protective compound shall be inspected for oil, grease, etc. Any areas where oil, grease, or any substance which can be removed by solvent is present shall be solvent cleaned using the guidelines outlined in SSPC-SP-1 Solvent Cleaning. After the surface has been made free of grease, oil, or other substances, all areas which are to receive the protective compounds shall be abrasive blasted using compressed air nozzles with sand or grit abrasive media. The blast media shall strike 100 percent of the surface area at sufficient force to remove rust and oxides. The entire surface to be lined shall be struck with the blast media so that all rust, loose, oxides, etc., are removed from the surface. Only slight stains and specks of tightly adhering oxides may be left on the surface. Any area where rust appears before coating must be reblasted to remove all rust.
 - b. Lining: After surface preparation and within 8 hours of surface preparation of the barrel of the pipe from the inside shoulder of the gasket groove to the end of the interior spigot shall receive a minimum coating of 40 mils dry film thickness of the protective lining. If flange fittings or pipe are included in the project the linings must not be used on the face of the flange; however, full face gaskets must be used to protect the ends of the pipe. All fittings shall be lined with a minimum of 40 mils of the protective lining. Push-on type fittings shall be lined from the gasket groove to the gasket groove. The 40 mils system shall not be applied in the gasket grooves.
 - c. Coating of Gasket Groove and Spigot Ends: Due to the tolerances involved, the gasket groove and spigot end up to 6 inches back from the end of the spigot end must be coated with a minimum of 10 mils dry of Protecto Joint Compound. This coating shall be applied by brush to ensure coverage. Care should be taken that the coating is smooth without

- excess buildup in the gasket groove or on the spigot end. All materials for the gasket groove and spigot end shall be applied after the application of the lining.
- d. Number of Coats: The number of coats of lining material applied shall be as recommended by the lining MANUFACTURER. However, in no case shall the material be applied above the dry thickness per coat recommended by the lining MANUFACTURER in printed literature. The time between coats shall never exceed that time recommended by the lining material MANUFACTURER. If at any time the lining must be recoated beyond the lining material MANUFACTURER's recommended recoat time, the surface of the existing lining shall be roughened sufficiently to prevent delamination between coats.
3. Inspection:
 - a. All pipe shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined in SSPC-PA-2 film thickness testing.
 - b. The barrel of all pipe and fittings shall be pinhole detected with a nondestructive 2,500-volt pinhole test.
 - c. Each pipe joint and fitting shall be marked with the date of application of the lining system and with its numerical sequence of application on that date.
 4. Certification: The pipe or fitting MANUFACTURER must supply a certificate attesting to the fact that the Applicator met the requirements of this specification, that the material used was as specified, and that the material was applied as required by the specification.
 5. Repair: All pinholes and damaged lined areas shall be repaired in accordance with written repair procedure furnished by the MANUFACTURER of the lining material so that the repaired area is equal in performance to the undamaged lined areas.
 6. The exterior of the pipe shall receive a bituminous coating approximately 1-2 mils thick in accordance with ANSI A21.51.

2.3 IDENTIFICATION

- A. Each length of pipe and each fitting shall be marked with the name of the MANUFACTURER, size, and class. All gaskets shall be marked with the name of the MANUFACTURER, size and proper insertion directions.
- B. All above ground piping and fittings shall be completely primed and painted the color purple (pantone 522C) for reclaimed water pipe, the color green (Kop Coat No. 0336) for gravity sewer pipe, and the color blue (Kop Coat No. 8155) for potable water pipe.

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- C. All below ground ductile iron pipe and fittings shall have an identification color code.
 - 1. Raw sewage force mains and gravity sewer pipe - Green, similar to Kop Coat, No. 0336.
 - 2. Reclaimed water irrigation reuse mains and service tubing - Purple, similar to Pantone 522C. CONTRACTOR shall stencil on top of the pipe and every 10 ft along the length of the transmission main the words " REUSE MAIN".
 - 3. Potable water mains and service tubing - Blue, similar to Kop Coat No. 8155.
- D. All buried ductile iron pipe shall be painted along its entire length with 2-inch stripes on at least three quarter points for pipe sizes 12-inches and larger. For pipe sizes smaller than 12-inches, a single 2-inch wide stripe along the top of the pipe shall be provided. Paint and marking tape colors shall be as described above.
- E. CONTRACTOR shall install 12-inches above the DI pipe, a 3" wide foil detector tape running the length of the pipe with color corresponding to the above code.

2.4 FUTURE STRUCTURE AND MANHOLE CONNECTIONS

Pipe stubs for all future manhole or pipe connections shall not be less than 24-inches in length. Watertight plugs or caps shall be furnished.

PART 3 - EXECUTION

3.1 INSTALLING DUCTILE IRON PIPE AND FITTINGS

- A. All water, sewer, and reclaimed water mains shall be installed in accordance with recommendations of the pipe MANUFACTURER and as specified herein.
- B. All pipe deflection or bends deflected more than 6% shall be restrained in accordance with the Restrained Pipe Joint Table. All fittings and valves shall be restrained in accordance with the Restrained Pipe Joint Table. See detail sheet.
- C. Care shall be taken in the handling, storage, and installation of pipe and fittings to prevent injury to the pipe or coatings. All pipe and fittings shall be examined before installing, and no pipe shall be installed which is found to be defective. Pipe or fittings shall not be dropped. All damage to the pipe coatings shall be repaired according to the MANUFACTURER's recommendations.

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- D. All pipe and fittings shall be kept clean and shall be thoroughly cleaned before installation.
- E. Pipe shall be laid to the lines and grades shown on the Drawings with bedding and backfill as shown on the Drawings and as specified in Section 02221. Blocking under the pipe will not be permitted.
- F. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work, and when laid, shall conform to the lines and grades required. Ductile iron pipe and fittings shall be installed in accordance with requirements of AWWA Standard Specification C600 except as otherwise provided herein. A firm, even bearing throughout the length of the pipe shall be constructed by tamping FDOT No. 89 stone at the sides of the pipe up to 6-inches over the top of the pipe, and then an additional 6 inches of selected material for a total of 12 inches over the top of the pipe. Blocking will not be permitted. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner by the CONTRACTOR, at his own expense.
- G. When installation is not in progress, including lunchtime, or the potential exists for dirt or debris to enter the pipe, the open ends of the pipe shall be closed with watertight plugs or other approved means.
- H. Under no circumstances shall the pipe or accessories be dropped into the trench.
- I. Polyethylene wrap – NOT USED
- J. All plugs, caps, bends and other locations where unbalanced forces exist shall be anchored by restrained joints. The length of pipe for which restrained joints shall be used are shown on the Drawings.
- K. In all cases where ductile iron pipe is installed, a marking tape shall be located above the top of the pipe.
- L. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be jointed with a bell shall be beveled to conform to the manufactured spigot end. Cement lining shall be undamaged.

3.2 PUSH-ON JOINTS

- A. Push-on joints shall be made in accordance with the MANUFACTURER's instructions. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe, and the

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joint surfaces cleaned and lubricated. The plain end of the pipe to be laid shall then be aligned and inserted in the bell of the pipe to which it is to be joined, and pushed home with a jack or by other means. After joining the pipe, a metal feeler shall be used to make certain that the rubber gasket is correctly located.

3.3 MECHANICAL JOINTS (NOT USED)

3.4 FLANGED JOINTS

- A. Flanged joints shall be installed where shown on the Drawings. Extreme care shall be exercised to insure that there is no restraint on opposite ends of pipe or fitting which will prevent uniform gasket compression, cause unnecessary stress, bending or torsional strains to flanges or flanged fittings. Adjoining push-on joints shall not be assembled until flanged joints have been tightened. Bolts shall be tightened alternately and evenly. After installation apply a bitumastic coating to bolts and nuts.

3.5 RESTRAINED JOINTS

- A. Restrained joints shall be installed in accordance with the Restrained Pipe Joint Table. See detail sheet. Restrained joints shall be installed at all fittings, bends deflected more than 6 degrees and valves as shown on the Drawings and specified herein. The joint assembly's for pipe sizes 30" and smaller shall be Fastite® Joint with Fast-Grip® Gasket by American Pipe Co. or ENGINEER approved equal. The joint assembly's for pipe sizes 36" shall be Flex-Ring® Joint by American Pipe Co. or ENGINEER approved equal. Restrained joints shall be installed in accordance with the MANUFACTURER's recommendations..

3.6 FLEXIBLE JOINT PIPE (NOT USED)

3.7 SLEEVE TYPE COUPLINGS

- A. Couplings shall be installed where shown. Couplings shall not be assembled until adjoining push-on joints have been assembled. After installation, apply a heavy bitumastic coating to all bolts, nuts and accessories.

3.8 POLYETHYLENE ENCASEMENT (NOT USED)

3.9 GRAVITY SEWER CONFLICT PIPING (NOT USED)

3.10 TESTING (PRESSURE PIPING)

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- A. All pressure mains shall be field-tested. Hydrostatic pressure and leakage tests shall conform with Section 4 of AWWA C600 Specification with the exception that the CONTRACTOR shall furnish all gauges, meters, pressure pumps and other equipment needed to test the line.
- B. The pressure required for the field hydrostatic pressure test shall be 100 psi for the raw sewage lift/pump stations and force mains and 150 psi for potable water mains and reclaimed water irrigation mains, unless otherwise noted. The CONTRACTOR shall provide temporary plugs and blocking necessary to maintain the required test pressure. Fill line slowly with water. Maintain flow velocity of less than 2.0 feet per second. Corporation cocks at least 1-inch in diameter, pipe riser and angle globe valves shall be provided at each pipe dead-end in order to bleed air from the line. Duration of pressure test shall be at least 2 hours. The cost of these items shall be included as a part of the contract price for pipe installation.
- C. The leakage test shall be a separate test at the maximum operating pressure as determined by the ENGINEER following the pressure test and shall be of not less than 2 hours duration. All leaks evident at the surface shall be repaired and leakage eliminated regardless of total leakage as shown by test. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves and accessories shall be removed and replaced. The pipe lines shall be tested in such sections as may be approved by the ENGINEER by shutting valves or installing temporary plugs as required. The line shall be filled with water and all air removed and the test pressure shall be maintained in the pipe for the entire test period by means of a force pump to be furnished by the CONTRACTOR. Accurate means shall be provided for measuring the water required to maintain this pressure. The amount of water required is a measure of the leakage.
- D. The amount of leakage which will be permitted shall be in accordance with AWWA C600 Standards for all pressure. No pipe installation shall be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD(P)^{1/2}}{133,200}$$

In which L is the allowable leakage in gallons per hour; S is the length of pipe tested, in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge.

- E. The CONTRACTOR must submit his plan for testing to the ENGINEER for review at least ten (10) days before starting the test. The CONTRACTOR shall remove and adequately dispose of all blocking material and equipment after completion and acceptance of the field hydrostatic test, unless otherwise approved by the ENGINEER. Any damage to the pipe coating shall be repaired by the CONTRACTOR. Lines shall be totally free and clean prior to final acceptance.

3.11 TESTING (GRAVITY SEWERS) (NOT USED)

3.12 CHLORINATION OF POTABLE PIPELINES

- A. Before being placed in service, all new potable water pipelines and reclaimed water irrigation mains including service connections and accessories shall be chlorinated using the continuous feed method specified in AWWA C651 "Standard Procedure for Disinfecting Water Mains." The procedure shall be approved by the ENGINEER in advance.
- B. The location of the chlorination and sampling points shall be determined by the ENGINEER in the field. Taps for chlorination and sampling shall be installed by the CONTRACTOR. The CONTRACTOR shall uncover and backfill the taps as required.
- C. The general procedure for chlorination shall be first to flush all dirty or discolored water from the lines, and then introduce chlorine in approved dosages through a tap at one end, while water is being withdrawn at the other end of the line. The chlorine solution shall remain in the pipeline for about 24 hours.
- D. Following the chlorination period, all treated water shall be flushed from the lines at their extremities, and replaced and water from the distribution system. All treated water flushed from the lines shall be disposed of by discharging to the nearest sanitary sewer or by other approved means. No discharge to any storm sewer or natural water course will be allowed. Bacteriological sampling and analysis of the replacement water shall then be made by the CONTRACTOR in full accordance with AWWA Specification C651. The CONTRACTOR will be required to rechlorinate, if necessary. The line shall not be placed in service until the requirements of the State and County Public Health Department are met.
- E. Special disinfecting procedures shall be used in connections to existing mains and where the method outlined above is not practical.
- F. The CONTRACTOR shall make all arrangements necessary with the County Health Department for examination of samples of water from disinfected water mains. These samples shall be examined for

compliance with Department of Health and Rehabilitative Services requirements. Sampling shall be made daily and continuously until two successive examinations are found satisfactory. Should three examinations be found unsatisfactory, the line shall be flushed and disinfected again. The cost of all sampling, flushing and disinfecting shall be included in the contract price and no additional charge shall be made to the OWNER for this work.

- G. The complete disinfection program and methods followed, especially if materially different from those specified, shall be in accordance with directives of the Florida Department of Environmental Protection and all methods employed shall have their approval. Definite instructions as to the collection and shipment of the samples shall be requested from the Florida Department of Environmental Protection and shall be followed in all respects. Final approval of the bacterial samples shall be received from the Florida Department of Environmental Protection prior to the time that the system is placed into operation.
- H. The cost for all flushing, disinfecting and testing shall be borne by the Contractor.

3.13 FLUSHING

After the mains have been laid and pressure tested, each run of pipe shall be thoroughly flushed so as to remove all debris and foreign matter from the lines. Flushing will ordinarily be done by opening fire hydrants or blowoffs along the pipe line. Where fire hydrants or blowoffs are not available or are of insufficient capacity to permit adequate flushing, the pipe line shall be opened and flumes or piping shall be provided by the Contractor to waste the water to the nearest approved disposal point. A minimum volume of water equal to 1.5 times the volume of the main shall be used to flush the mains. The water shall be introduced into the mains to produce a velocity of not less than 2-1/2-feet per second, and this rate of flow shall be continued until the discharge is clear and no evidence of silt or foreign matter is visible.

3.14 CLEANING

- A. At the conclusion of the work the CONTRACTOR shall thoroughly clean all of the new pipelines by flushing with water and pigged to remove all dirt, stones, pieces of wood, or other material which may have entered during the construction period. Debris cleaned from the lines shall be removed from the job site. If, after this cleaning, any obstructions remain, they shall be removed.
- B. After the pipelines are cleaned and if the groundwater level is above the pipe, or following a heavy rain, the ENGINEER will examine the pipe for

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leaks. If defective pipes or joints are discovered at this time, they shall be repaired or replaced by the CONTRACTOR.

END OF SECTION 02619

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SECTION 02622 - POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS (AWWA SPECIFICATIONS C-900)

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install in the locations as shown on the Drawings, the plastic piping, fittings and appurtenances as specified herein.

1.2 QUALIFICATIONS

All plastic pipe, fittings and appurtenances shall be furnished by a single manufacturer who is fully experienced, reputable, and qualified in the manufacture of the items to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these Specifications.

1.3 SUBMITTALS

- A. Shop drawings shall be submitted to the Engineer and shall include dimensions and technical specifications for all piping.
- B. Submit to the Engineer, samples of all materials specified herein.
- C. The Contractor shall submit and shall comply with pipe manufacturer's recommendation for handling, storing and installing pipe and fittings.
- D. The Contractor shall submit pipe manufacturer's certification of compliance with these Specifications.

1.4 TOOLS

Special tools, solvents, lubricants, and caulking compounds required for normal installation shall be furnished with the pipe.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Class-Rated Polyvinyl Chloride (PVC) Pipe:

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1. Class-rated PVC pipe and accessories four to twelve inches (4"-12") in diameter, where shown or as specified on the Drawings, shall meet the requirements of AWWA Specification C-900 "Polyvinyl Chloride (PVC) Pressure Pipe". Pipe shall be Class 100, meeting requirements of Dimension Ratio (DR) 18 and shall have the dimension of ductile iron outside diameters. Each length of pipe shall be hydro-tested to four (4) times its class pressure by the manufacturer in accordance with AWWA C-900.

PVC pipe 14-inches through 36-inches shall meet the requirements of AWWA Standard C-905, Polyvinyl Chloride (PVC) Wastewater Forcemain Pipe, Nominal Diameters 14 inches through 36 inches. Pipe shall be Class 160 and meet the requirements of dimension ratio (DR) 26 and shall have the dimension of ductile iron outside diameters. Each length of pipe shall be tested at twice the pressure rating (PR 160 psi) for a minimum dwell of 5 seconds in accordance with AWWA C-905. Pipe shall be class 160 at minimum and meet the requirements of dimension ratio (DR) 26 (AWWA C905) or 25 (Uni-Bell B-11) and shall have the dimension of ductile iron outside diameters. Each length of pipe shall be tested at twice the pressure rating for a minimum dwell of 5 seconds in accordance with AWWA C-905.

Provisions shall be made for expansion and contraction at each joint with an elastomeric ring, and shall have an integral thickened bell as part of each joint. PVC Class pipe shall be installed as recommended by the manufacturer. Pipe shall be furnished in nominal lengths of approximately 20 feet, unless otherwise directed by the Engineer. Pipe and accessories shall bear the NSF mark indicating pipe size, manufacturer's names, AWWA and/or ASTM Specification number, working pressure, and production code. Pipe shall be blue for potable water service, green for sewage force main service and purple for reclaimed water mains (Pantone 522C). All potable water pipe shall be NSF certified and copies of lab certification shall be submitted to the Engineer.

B. Joints:

1. The PVC joints for pipe shall be of the push-on type unless otherwise directed by the Engineer so that the pipe and fittings may be connected on the job without the use of solvent cement or any special equipment. The push-on joint shall be a single rubber gasket joint designed to be assembled by the positioning of a continuous, molded rubber ring gasket in annular recess in the pipe

or fitting socket and the forcing of the plain end of the entering pipe into the socket, thereby compressing the gasket radially to the pipe to form a positive seal. The gasket and annular recess shall be designed and shaped so that the gasket is locked in place against displacement as the joint is assembled. The rubber ring joint shall be designed for thermal expansion or contraction with a total temperature change of at least 750 degrees F in each joint per length of pipe. The bell shall consist of an integral wall section with a solid cross section elastomeric ring, which shall meet requirements of ASTM F-477. The thickened bell section shall be designed to be at least as strong as the pipe wall. Lubricant furnished for lubricating joints shall be nontoxic, shall not support the growth of bacteria, shall have no deteriorating effects on the gasket or pipe material, and shall not impart color, taste, or odor to the water.

C. Fittings:

1. All fittings for class-rated PVC pipe shall be ductile iron with mechanical joints and shall conform to section 02619 of these specifications for ductile iron fittings, unless otherwise directed. PVC C-900 fittings are *not* allowable.
 - a. Fittings for Schedule 80 PVC pipe less than three inches (3") in diameter shall be threaded and be PVC as shown on the Drawings, or as directed by the Engineer. Threaded PVC fittings shall conform to ASTM Specification D2464-69).
 - b. The manufacturer of the pipe shall supply all polyvinyl chloride accessories as well as any adaptors and/or specials required to perform the work as shown on the drawings and specified herein. Standard double bell couplings will not be accepted where the pipe will slip completely through the coupling.

PART 3 - EXECUTION

3.1 STORAGE/INSTALLATION

The storage and installation of plastic pipe shall be strictly in accordance with manufacturer's technical data and printed instruction. All plastic pipe shall be properly covered to prevent fading. The Owner reserves the right to reject any pipe not properly stored or pipe that has faded.

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3.2 INSPECTION AND TESTING

- A. All pipelines shall remain undisturbed for 24 hours to develop complete strength at all joints.

General: Provide temporary equipment for testing, including pump and gages. Test piping system before insulation is installed wherever feasible, and remove control devices before testing. Before applying the specified test pressure, expel air from the pipe. To accomplish this, taps shall be made, if necessary, at points of highest elevation, and afterwards tightly plugged. Test each natural section of each piping system independently but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating. Fill each section with water and subject to a hydrostatic pressure equal to the pressure rating of the pipe being tested.

- B. Required test periods is 2 hours or until the line has been completely inspected for visual leaks.
- C. Test pipe at 100 psi, except where fittings are lower class or pressure rating.
- D. Pressure Sewer Permissible leakage (2.2 gal/1000 ft./24hrs./inch diameter):

	<u>gal's/1000'/24 Hrs.</u>	<u>gal's/1000'/1 Hr.</u>
2"	4.4 gal.	0.19 gal.
3"	6.6 gal.	0.28 gal.
4"	8.8 gal.	0.37 gal.
6"	13.2 gal.	0.55 gal.
8"	17.8 gal.	0.74 gal.
10"	22.0 gal.	0.92 gal.
12"	26.4 gal.	1.10 gal.
14"	30.8 gal.	1.29 gal.
16"	35.2 gal.	1.47 gal.
18"	39.6 gal.	1.66 gal.

- E. Water System Permissible Leakage:

	<u>gal's/1000'/24 Hrs.</u>	<u>gal's/1000'/1 Hr.</u>
2"	3.6 gal.	0.15 gal.
3"	5.4 gal.	0.23 gal.
4"	7.2 gal.	0.30 gal.

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6"	10.8 gal.	0.45 gal.
8"	14.4 gal.	0.60 gal.
10"	18.0 gal.	0.75 gal.
12"	21.6 gal.	1.90 gal.
14"	25.2 gal.	1.05 gal.
16"	28.8 gal.	1.66 gal.
18"	32.4 gal.	1.66 gal.

- F. Repair piping systems sections which fail required piping tests, by disassembly and re-installation using new materials to the extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.
- G. Should any test of combined sections of pipe laid disclose leakage greater than the specified limit, the Contractor shall, at his own expense, locate and repair the defective joints until the leakage is within the specified allowance.
- H. Water for testing shall be provided by the Contractor.
- I. Pipe may be subjected to hydrostatic pressure, inspected and tested for leakage at any convenient time after partial completion of backfill. The Contractor may test the system with joints exposed or backfilling complete at his option. The Engineer shall be notified at least forty-eight hours before beginning testing.
- J. Drain test water from piping systems after testing and repair work has been completed.

3.3 CLEANING, FLUSHING, INSPECTING:

- A. General: Clean exterior surfaces of installed piping systems of superfluous materials, prepare for application of specified coatings (if any). Flush out piping systems with clean water before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.
- B. Inspect pressure piping in accordance with procedures of ASME B31.

END OF SECTION 02622

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SECTION 02640 - VALVES AND ACCESSORIES FOR WASTEWATER

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

The Contractor shall furnish and install all gate valves, butterfly valves, check valves, and other special valves and piping accessories as shown on the drawings and as specified herein.

1.2 SUBMITTALS

- A. Submit shop drawings or manufacturer's product data on all items in PART 2 in accordance with Section 01300 of these specifications.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. All valve operators shall be designed as not to require over 80 pounds pull to meet the required torque to operate the valves.
- B. All manually operated, shut-off or isolation valves, above grade, shall be furnished with handwheel or lever operators.
- C. All manually operated, shut-off or isolation valves, below grade, shall be furnished with AWWA 2-inch square actuating nuts and valve boxes. Valve boxes shall consist of cast iron base and adjustable top section with cover which shall be marked "WATER" for water service or "SEWER" for wastewater applications. All valve boxes shall be provided with valve position indicators. One T-handle wrench shall be furnished.
- D. Valves shall be handled with care to avoid damage. All valves shall be loaded and unloaded by lifting, and under no circumstances shall valves be dropped, skidded or rolled. Valves shall not be placed, under any circumstances, against pipe or other fittings in such a manner that damage could result. Slings, hooks or tongs used for lifting shall be padded in such a manner as to prevent damage. If any part of the valves' coating and lining is damaged by the Contractor, the repair or replacement shall be made by the Contractor at his expense in a manner satisfactory to the Owner's Engineer before installing. Valves shall also be stored at all times in a safe manner to prevent damage and kept free of dirt, mud or other foreign matter. All valve gaskets shall be stored and placed in a cool location out of direct sunlight and out of contact with

petroleum products. All gaskets shall be used on a first-in, first-out basis.

2.2 GATE VALVES

- A. Resilient seat gate valves shall be cast or ductile iron bodied, bronze mounted, with wedge type disk and rubber seat. Valves shall be manufactured in accordance with AWWA C509. Valves shall be suitable for buried service, be designed for 200 psi working pressure, shall be of O-ring type, with non-rising stem and opening counterclockwise. Valves shall be bubble-tight at 200-psi water working pressure. Test pressure shall be twice the rated working pressure and at all times zero leakage will be maintained. Valves shall have mechanical joint ends, except above ground valves shall be flanged. Body and cover bolts shall meet specifications ASTM A-307 and be rust proof. The body and bonnet shall be coated with fusion bonded epoxy both interior and exterior. Valves shall be coated in accordance with AWWA C550. Each valve shall have maker's name, pressure rating and year in which manufactured cast on body.
- B. Valves shall be Clow, M and H, Muller or pre-approved equal

2.3 PLUG VALVES (NOT APPLICABLE)

2.4 AIR RELEASE VALVE ASSEMBLY

- A. An air release valve assembly shall be furnished and installed on the force mains as shown on the drawings. Air release or valve assembly shall consist of a combination short body, air release-vacuum breaker valves, installed in a manhole with vented manhole cover, gate valve, fittings, tapping saddle and connecting piping to the main.
- B. Valves shall be corrosion resistant, suitable for sewage force main application, and shall automatically function to release to the atmosphere both large and small amounts of air that accumulate in the pipeline. Once the air has been exhausted, both valves shall seal tightly to prevent liquid leakage. The valve shall also function to admit air into a line, tank, or chamber under emergency conditions or when it is being drained.
- C. The capacity and pressure rating of the valve is dependent on the diameter of the precision orifice in the cover. The Orifice Size shall be 5/16-inch. A large inlet connection is required for proper air and water exchange. The sewage air release valves inlet size shall be 2-inch for wastewater mains. The Air Release Valves shall be automatic float operated valves designed to release accumulated air from a piping system while the system is in operation and under pressure and installed in a concrete box as shown on the drawings. Box and like shall be of the necessary size to the valve. To

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connect the air valve, a corporation stop shall be tapped into the main using the procedures as recommended by the ductile iron pipe manufacturer. The corporation stop shall be Mueller H-10045 or approved equal.

- D. The valve body shall be threaded with NPT inlets and outlets. The body inlet connection shall be hexagonal for a wrench connection. The valve shall have two additional NPT connections for the addition of gauges, testing and draining. The valve body and cover shall be constructed of ASTM A126 Class B cast iron working pressures of 200 psig, with resilient seats, rubber covered floats and no levers.
- E. The cover shall be bolted to the valve body and sealed with a flat gasket. Resilient seats shall be replaceable and provide drop tight shut off to the full valve pressure rating. Floats shall be unconditionally guaranteed against failure including pressure surges. Mechanical linkage shall provide sufficient mechanical advantage so that the valve will open under full operating pressure. The orifice, float and linkage mechanisms shall be constructed of Type 304 stainless steel. Non-metallic floats or linkage mechanisms are not acceptable.
- F. Higher pressure rated valves shall be constructed of ASTM A536 Grade 65-45-12 ductile iron.
- G. The manufacturer shall demonstrate a minimum of five (5) years experience in the manufacture of air valves. The valves shall be manufactured and tested in accordance with American Water Works Association Standard (AWWA) C512.
- H. The manufacturer shall provide test certificates, dimensional drawings; parts list drawings, and operation and maintenance manuals. The exterior of the valve shall be coated with a universal alkyd primer.
- I. Air Release Valves shall be as manufactured by Val-Matic Valve & Mfg. Corporation, Elmhurst, IL. USA or approved equal.

2.2 CHECK VALVES

2.2.2 TIDE FLEX FLANGED-END and SLIP-ON CHECK VALVES

A. "DUCKBILL" ELASTOMERIC CHECK VALVES

- 1. Check Valves are to be all rubber and the flow operated check type with a flanged end or slip on connection as displayed in drawings. The port area shall contour down to a duckbill, which shall allow

passage of flow in one direction while preventing reverse flow. The flange and flexible duckbill sleeve shall be one-piece rubber construction with nylon reinforcement. In sizes 20" and larger, the bill portion shall be thinner and more flexible than the valve body, and formed into a curve of 180°. The flange drilling shall conform to ANSI B16.1 Class 125/ANSI B16.5, Class 150 standards. The valve shall be furnished with steel back-up rings for installation. Upon request, manufacturer must have available flow test data from an accredited hydraulics laboratory to confirm pressure drop data. Company name, plant location, valve size and serial number shall be bonded to the check valve. Upon request, product literature shall be submitted that includes information on the performance and operation of the valve, materials of construction, dimensions and weights, elastomer characteristics, headloss and flow data, and pressure ratings. Shop drawings must clearly identify the valve dimensions. Supplier shall have at least ten (10) years experience in the manufacture of "duckbill" style elastomeric valves, and shall provide references and a list of installations upon request.

2. All valves shall be of the TF-2 as manufactured by the Red Valve Co., Inc. of Carnegie, PA 15106 or approved equal.

2.2.3 SWING CHECK VALVES

- A. Swing Check Valves shall be furnished and installed on the force mains as shown on the drawings.
- B. The Swing Check valves shall meet the following specifications:

RATING: 2"-12"=150 psi water, 14"-36"=150 psi water

ENDS: Flanged, F.F., 125# ANSI B 16.1

BODY: Cast Iron, ASTM A 126, Class B

BONNET: (Cover) Cast Iron, ASTM A 126, Class B

BODY & BONNET BOLTING: ASTM A 307, GR. B

DISC: Cast Iron, ASTM A 126, Class B with Bronze Bushing and Bronze Faced

STEM: (Clapper Arm Shaft) Stainless Steel

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SEAT: Bronze Renewable

SEALS (OR PACKING): Conventional Packing

OPERATOR: Outside Weight and Lever

SERVICE: Water and Wastewater, Oil and Gas

REMARKS: Horizontal or Vertical Installation

- C. All Swing Check Valves shall be manufactured by AVK Series 41 or pre-approved equal.

2.6 TAPPING SLEEVES AND VALVES

- A. Cast iron or Stainless Steel tapping sleeves and valves shall be used to make "wet" taps into the existing mains where shown on the drawings. The tapping sleeve shall be of the split type with mechanical joints, cast iron bolts and flanged outlet for connection to the tapping valve. Contractor shall verify type of existing main before ordering sleeve. The tapping valve shall have an inlet flange to match the sleeve and a mechanical joint outlet for connection to main pipe. Tapping valve shall be resilient seat gate valves, rated for 200 psi working pressure, open counterclockwise with non-rising stem and have O-rings. Provide valve with box.

2.7 VALVE BOXES

- A. Valve boxes shall be provided for all buried valves. Valve boxes shall consist of cast iron base and adjustable top section with cover, which shall be marked "Sewer". Extension shall be provided as required to meet grade.

PART 3 - EXECUTION

3.1 SETTING VALVES AND BOXES

- A. Valves and valve boxes as specified in the preceding paragraphs shall be installed where shown on the drawings unless otherwise directed. Valves shall be set plumb with the base of the valve box centered over the valve and resting on compacted backfill. The top section of the box shall be set to allow equal movement above and below finished grade. After being correctly positioned, fill shall be carefully tamped around the valve box for a distance of 4-feet on all sides of the box. In paved areas, top of the cover shall be flush with the finished paving. In off-street areas, the cover

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shall be set 1-inch above existing grade unless otherwise directed by the Engineer/Architect and a concrete pad shall be poured around the top of the box as shown in the standard details.

END OF SECTION 02640

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SECTION 02665 - WATER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes water systems piping for potable water service and fire protection service outside the building.
- B. This Section does not include tapping of utility company water main by utility company and charged directly to Owner.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 15 Sections for water distribution systems inside building.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressure Ratings: Except where otherwise indicated, the following are minimum pressure requirements for water system piping.
 - 1. Underground Piping: 150 psig (1035 kPa).
 - 2. Underground Piping, Downstream of Fire Department Connections: 200 psig (1380 kPa).

1.4 SUBMITTALS

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- B. Product data, including pressure rating, rated capacity, and settings of selected models for the following:
 - 1. Piping.
 - 2. Pipe fittings.
 - 3. Valves.
 - 4. Fire hydrants.

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5. Piping specialties.
 6. Identification materials and devices.
- C. Shop drawings for precast concrete pits. Include frames and covers. Include drains when indicated.
 - D. Shop drawings for cast-in-place concrete valve and meter pits. Include frames and covers. Include drains when indicated.
 - E. Record drawings at Project closeout of installed water system piping and products according to Division 1 Section "Project Closeout."
 - F. Test reports specified in "Field Quality Control" Article in Part 3.

1.5 QUALITY ASSURANCE

- A. Comply with requirements of utility supplying water. Include tapping of water mains and backflow prevention.
- B. Comply with standards of authorities having jurisdiction for potable water piping and plumbing systems. Include materials, installation, testing, and disinfection.
- C. Provide listing/approval stamp, label, or other marking on equipment made to specified standards.
 1. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- D. Product Options: Water systems specialties and accessories are based on specific types, manufacturers, and models indicated. Components by other manufacturers but having equal performance characteristics may be considered, provided deviations in dimensions, operation, and other characteristics do not change design concept or intended performance as judged by Engineer. The burden of proof of equality of products is on Contractor. Refer to Division 1 Section "Product Substitutions."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare valves, including fire hydrants, for shipping as follows:
 1. Ensure that valves are dry and internally protected against rust and corrosion.
 2. Protect valves against damage to threaded ends, flange faces, and weld ends.
 3. Set valves in best position for handling. Set valves closed to prevent rattling.

4. Stake piping so as to prevent damage.
-
- B. Storage: Use the following precautions for valves, including fire hydrants, during storage:
 1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
 2. Protect valves from weather. Store valves indoors and maintain temperature higher than ambient dew point temperature. Support valves off ground or pavement in watertight enclosures when outdoor storage is necessary.
 - C. Handling: Use sling to handle valves and fire hydrants whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handwheels or stems as lifting or rigging points.
 - D. Deliver pipes and tubes with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
 - E. Protect stored pipes from moisture and dirt. Elevate above grade.
 - F. Protect flanges, fittings, and piping specialties from moisture and dirt.
 - G. Store plastic pipes protected from direct sunlight (only when installation is not completed within six months of date received). Support to prevent sagging and bending.
-
- 1.7 PROJECT CONDITIONS
- A. Perform site survey, research public utility records, and verify existing utility locations. Contact utility-locating service for area where Project is located.
 - B. Verify that water system piping may be installed in compliance with original design and referenced standards.
 - C. Site Information: Reports on subsurface condition investigations made during the design of the Project are available for informational purposes only; data in reports are not intended as representations or warranties of accuracy or continuity of conditions (between soil borings). Owner assumes no responsibility for interpretations or conclusions drawn from this information.

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1.8 SEQUENCING AND SCHEDULING

- A. Coordinate connection to water main with utility company.
- B. Coordinate with other utility work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following. Since the Owner has developed a standard inventory of materials and supplies, when no equal is called for, only that manufacturer listed will be acceptable.
 - 1. Corporation Stops:
 - a. Ford Meter Box Co., Inc., Style F-1000-3G
 - 2. Curb Stops:
 - a. Ford Meter Box Co., Inc., Style B-43-232WG
 - 3. Service Saddles:
 - a. Ford Meter Box Co., Style S70 Series
 - 4. Service Tubing:
 - a. CTS 200 psi. SDR9 ASTM D-2737
 - 5. Resilient Seat Wedge and Swing Check Valves:
 - a. M & H Valve Company
 - b. American Darling Valve Div., American Cast Iron Pipe Co.
 - c. Mueller Co., Grinnell Corp.
 - 6. Dry-Barrel Fire Hydrants:
 - a. M & H Company
 - b. American Darling Valve Div., American Cast Iron Pipe Co.
 - c. Mueller Co., Grinnell Corp.
 - 7. Flushing Hydrants:
 - a. M & H Company or equal.

2.2 PIPES AND TUBES

- A. Refer to Part 3 Article "Piping Applications" for identification of systems where pipe and tube materials specified below are used.
- B. Ductile-Iron Pipe: AWWA C151, Classes 150, 200, and 250.
 - 1. Lining: AWWA C104, cement mortar, seal coated.
 - 2. Gaskets, Glands, and Bolts and Nuts: AWWA C111.
 - 3. Push-On-Joint-Type Pipe: AWWA C111, rubber gaskets.

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4. Mechanical-Joint-Type Pipe: AWWA C111, rubber gaskets, ductile- or cast-iron glands, and steel bolts and nuts.
- C. Copper Tube: ASTM B 88, Types K and L (ASTM B 88M, Types A and B), seamless water tube, annealed temper.
- D. Polyvinyl Chloride (PVC) Plastic Pipe (2"-12"): C-900, DR25.
 1. Pipe Marking: NSF 14, "NSF-pw".
- E. Polyethylene (PE) Plastic Pipe: ASTM D 2737, SDR9 (PE 3408)
 1. Pipe Marking: NSF 14, "NSF-PW".
- F. High Density Polyethylene (HDPE) Plastic Pipe: ASTM F-714 - Pipe Std.; ASTM D3261 - Fittings Std.; AWWA C-901; 3"-8" SDR 11.0, 160 psi.
 1. Pipe Markings: NSF 14, "NFS-PW".
 2. Because of I.D., sizing is different than that of PVC, the HDPE is normally one size larger than the PVC size.
 3. Transition from the larger HDPE sizes to the PVC sizes shall be made at the point where the flanged connection is to be made, as detailed in Section 2.11.

2.3 PIPE AND TUBE FITTINGS

- A. Refer to Part 3 Article "Piping Applications" for identification of systems where pipe and tube fitting materials specified below are used.
- B. Ductile-Iron Pipe Fittings: AWWA C110, ductile-iron or cast-iron, 250-psig (1725 kPa) minimum pressure rating; or AWWA C153, ductile-iron compact fittings, 350-psig (2400 kPa) pressure rating.
 1. Lining: AWWA C104, cement mortar.
 2. Gaskets: AWWA C111, rubber.
- C. Ductile-Iron Flanged Fittings: AWWA C110, 250-psig (1725 kPa) minimum pressure rating, with AWWA C104 cement-mortar lining.
- D. Ductile-Iron, Flexible Expansion Joints: Compound fitting with combination of flanged and mechanical-joint ends conforming to AWWA C110 or AWWA C153. Units have 2 gasketed ball-joint sections and 1 or more gasketed sleeve sections, rated for 250-psig (1725 kPa) minimum working pressure and with FDA-approved epoxy interior coating, for offset and expansion indicated.
- E. Polyvinyl Chloride (PVC) Pipe and Fittings: No PVC fittings will be allowed for pipe sizes 3" and larger.

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- F. Polyvinyl Chloride (PVC) Plastic, Schedule 80, Socket-Type Pipe Fittings: ASTM D 2467.
 - 1. Pipe Marking: NSF 14, "NSF-pw".
- G. Polyvinyl Chloride (PVC) Plastic, Schedule 40, Socket-Type Pipe Fittings: ASTM D 2466.
 - 1. Pipe Marking: NSF 14, "NSF-pw".
- H. Polyvinyl Chloride (PVC) Pipe Fittings (Sizes 2" and Under): Schedule 40 socket-type, solvent cement joint, or elastomeric gasketed joint.
 - 1. Pipe Marking: NSF 14, "NSF-pw".
 - 2. Gaskets: ASTM F 477, elastomeric seal.
- I. High Density Polyethylene (HDPE) Plastic Pipe Joint Adapters: All transitions at each end of directional bores shall be made using HDPE reducers and a self-restrained mechanical joint adapter similar to those manufactured by "Driscopipe" or "Independent Pipe Products".

2.4 JOINING MATERIALS

- A. Refer to Part 3 Article "Piping Applications" for identification of systems where joining materials specified below are used.
- B. Ductile-Iron Pipe and Ductile-Iron or Cast-Iron Fittings: The following materials apply:
 - 1. Push-On Joints: AWWA C111 rubber gaskets and lubricant.
 - 2. Mechanical Joints: AWWA C111 ductile-iron or gray-iron glands, high-strength steel bolts and nuts, and rubber gaskets.
 - 3. Flanged Joints: AWWA C115 ductile-iron or gray-iron pipe flanges, rubber gaskets, and high-strength steel bolts and nuts.
 - a. Gaskets: Rubber, flat face, 1/8 inch (3 mm) thick except where other thickness is indicated; and full-face or ring type except where other type is indicated.
 - b. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, except where other material is indicated.
- C. Primers for PVC Piping Solvent-Cement Joints: ASTM F 656.
- D. Solvent Cement for PVC Piping Solvent-Cement Joints: ASTM D 2564.
- E. Pipe Couplings: Iron-body sleeve assembly, fabricated to match outside diameters of pipes to be joined.

2.5 VALVES

- A. Nonrising Stem Gate Valves 2 Inches (50 mm) and Larger: AWWA C509, resilient seated; bronze stem, cast-iron or ductile-iron body and bonnet, stem nut, 200-psig (1380 kPa) working pressure, mechanical joint ends. Valves shall open counterclockwise unless indicated otherwise.
- B. Check Valves: Valves 3" and larger shall be iron body, bronze mounted, horizontal-swing check with external lever and flanged ends. All valves shall meet the requirements of AWWA C508-82. The check valve used on the main discharge line at the new well will be fitted with a rubber-faced clapper.
- C. Valve Boxes: Cast-iron box having top section and cover with lettering "WATER," bottom section with base of size to fit over valve and barrel approximately 5 inches (124 mm) in diameter, and adjustable cast-iron extension of length required for depth of bury of valve.
 - 1. Provide a steel tee-handle operating wrench for every 20 valve boxes. Wrench shall have tee handle with one pointed end, stem of length to operate valve, and socket-fitting valve-operating nut.
- D. Curb Stops: Bronze body, ground key plug or ball, and wide tee head, with inlet and outlet to match service piping material.
- E. Tapping Sleeve and Tapping Valve: Complete assembly, including tapping sleeve, tapping valve, and bolts and nuts. Use sleeve and valve compatible with tapping machine.
 - 1. Tapping Sleeve: Cast-iron or ductile-iron 2-piece bolted sleeve with flanged outlet for new branch connection. Sleeve may have mechanical joint ends with rubber gaskets or sealing rings in sleeve body. Use sleeve that mates with size and type pipe material being tapped. Outlet flange shall be size required for branch connection.
- F. Service Clamps and Corporation Stops: Complete assembly, including service clamp, corporation stop, and bolts and nuts. Use service clamp and stop compatible with drilling machine.
 - 1. Service Clamp: Cast iron or ductile iron with gasket and AWWA C800 threaded outlet for corporation stop, and threaded end straps.
 - 2. Corporation Stops: Bronze body and ground key plug, with AWWA C800 threaded inlet and outlet matching service piping material.
- G. Pressure Regulating Valves: The valves shall be hydraulically operated, diaphragm actuated, in a wye pattern body. The actuator assembly shall be able to be removed as a single body on the pressure reducing valves, a pressure reducing pilot valve with adjustable spring loads shall be included to control. The pilot valve shall also have a strainer in order to maintain the valve free from debris. Each valve shall be provided to reduce pressures to that

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shown on the Construction Plans. The main valve shall be fitted with a valve position indicator. The valve shall be coated using AWWA C213-85 standards.

2.6 HYDRANTS

A. Fire Hydrants:

1. General: Cast-iron body, compression-type valve, opening against pressure and closing with pressure, 6-inch (150 mm) mechanical joint inlet, 150-psig (1035 kPa) working pressure.
2. Outlet Threads: NFPA 1963, with external hose thread used by local fire department. Include cast-iron caps with steel chains.
3. Operating and Cap Nuts: Pentagon 1-1/2 inch (40 mm) point to flat.
4. Direction of Opening: Open hydrant valve by turning operating nut to the left, or counterclockwise.
5. Finish: Red exterior alkyd gloss enamel paint.
6. Dry-Barrel Fire Hydrants: AWWA C502, two 2-1/2-inch (65 mm) and one 4-1/2-inch (113 mm) outlets, 5-1/4-inch (133 mm) main valve, drain valve, and 6-inch (150 mm) mechanical joint inlet. All hydrants shall be three-way.

B. Flushing Hydrants:

1. Flushing hydrants shall be non-freezing, self-draining type. These hydrants will be furnished with a 2" FIP inlet, a non-turning operating rod, and shall open to the left. All of the working parts shall be of bronze-to-bronze design.

2.7 ANCHORAGES

- A. Clamps, Straps, and Washers: ASTM A 506, steel.
- B. Rods: ASTM A 575, steel.
- C. Rod Couplings: ASTM A 197, malleable iron.
- D. Bolts: ASTM A 307, steel.
- E. Cast-Iron Washers: ASTM A 126, gray iron.
- F. Concrete Reaction Backing: Portland cement concrete mix, 3000 psi (20.7 MPa).
 1. Cement: ASTM C 150, Type I.
 2. Fine Aggregate: ASTM C 33, sand.
 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 4. Water: Potable.

2.8 CASING (UNDER ROADWAYS)

- A. Casing under all State and Federal highways shall meet, at a minimum, the following:
 - 1. Wall Thickness: (Steel Casing)
 - a. 4"-6" = 0.083"; ASTM A139, Grade B
 - b. 8"-12" = .104"; ASTM A139, Grade B
 - c. 14"-20" = .134; ASTM A139, Grade B
 - 2. All casing as a minimum shall extend 8 feet beyond the edge of roadway surfaces, or as indicated on the Drawings or required by the permit.
- B. Casing for water service tubing under all State highways may be HDPE. The casing shall extend 8 feet beyond the edge of roadway surfaces.

2.9 CASING (UNDER RAILROADS)

- A. All pipelines installed under railroads and railroad rights-of-way shall be encased in a casing pipe. For non-flammable substances, casing pipe and joints shall be of leakproof construction capable of withstanding Cooper E-80 loading.
- B. Casing pipe under railway tracks and across railway rights-of-way shall extend to the greater of the following distances, measured at right angles to centerline of track: a) 2 feet beyond toe of slope; b) 3 feet beyond ditch line; c) a minimum distance of 25 feet each side from centerline of outside track when casing is sealed at both ends; d) a minimum distance of 45 feet each side from centerline of outside track when casing is left open at both ends.
- C. Casing shall be sealed at both ends to prevent the formation of a waterway under the railway. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe by more than approximately one inch, remedial measures as approved by the Engineer shall be taken.
- D. Casing pipes under tracks and rights-of-way shall not be less than 5-1/2 feet from base of rail to top of casing pipe at its closest point except that under secondary of industry tracks, this distance may be 4-1/2 feet.
- E. ANSI Codes B31.8 and B31.4 current at the time of constructing the pipeline shall govern the inspection and testing for the facility within the rights-of-way as follows:
 - 1. One hundred percent (100%) of all field welds shall be inspected by radiographic examinations and such field welds shall be inspected for 100% of the circumference.
 - 2. The proof testing of the strength of the carrier pipe shall be in accordance with the requirements of ANSI B31.8 for Class Locations 2, 3, 4 or B31.4 as applicable.

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3. CAUTION: Sometimes fiber optics telephone cables exist within the right-of-way. The Contractor is to provide for their protection.

F. All casing wall thickness shall be as follows:

1. 6"-12" 0.250"
2. 14"-16" 0.281"

2.10 CASING/PIPE SPACERS

A. The Contractor shall provide casing spacers for all piping routed through steel casing (not required on PVC HDPE casing). The spacers shall be stainless steel construction with UHMW polymer runners and shall be in two (2) halves. The nuts and bolts used shall be stainless steel. A total of no less than two (2) spacers per joint of pipe shall also be used plus one (1) near the openings (ends) of the casing. The spacers shall be Model CCS by Cascade Water Works Manufacturing Co., Model SSI by Advanced Products & Systems, Inc., or equal.

B. The Contractor shall provide casing end seals on all casings. The end seals shall wrap around the casing and carrier pipes after installation to provide a barrier to backfill debris and seepage. Stainless steel bands shall be used to secure the end seals. The casing end seals shall be Model CCES by Cascade Waterworks Mfg. Company, Advance Products and Systems or equal.

2.11 DIRECTIONAL DRILLING

A. Where indicated on the drawings, the Contractor shall use directional drilling (trenchless excavation). The directional drilling shall be done using experienced personnel as well as properly sized equipment rated for both the size and length of pipe to be installed. The equipment shall incorporate the use of a radio detection locating device. The locating device shall be capable of determining the position of the drill head plus or minus two (2) inches.

B. The actual drilling process shall be one of displacement and compaction. The drill head shall cut its own hole and then compact the displaced material against the walls of the drilled hole. Bentonite shall be used to help hold the walls of the hole in place and ultimately fill the voids between the pipe and the walls of the hole.

C. The pipe to be installed in all directional drilling shall be high density polyethylene, as detailed in Section 2.2 above. All piping shall be fitting with flanged or approved fittings at both ends. The length shall be sufficient length to allow for at least a minimum of 10 feet below the bottom of the obstacle being drilled under.

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- D. All normal precautions shall be utilized to protect any existing utilities within the drilling area.
- E. The directional drilling company shall be a member in good standing of the National Society for Trenchless Technology.

2.12 IDENTIFICATION

- A. On construction involving non-metallic pipe, a 10-gauge, THHN insulated, solid copper wire shall be laid in the pipe trench. The wire shall be continuous from valve box to valve box. All splices made along the pipe line shall also be insulated. The wire shall be wrapped two times around each valve, then extend up inside the valve box to enable a location device to be attached without digging up the valve box. The wire will be laid at least 12" above the pipe.
- B. Composite utility markers will be provided at various locations throughout the project. The locations will be as directed by the Engineer.
- C. The Contractor shall also provide a utility marker driver for installation of all markers. Upon completion of the project, the driver shall be turned over to the Owner in good condition.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Division 2 Section "Earthwork."

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. General Locations and Arrangements: Drawings indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated except where deviations to layout are approved on coordination drawings.
- B. Install piping at indicated slope.
- C. Install components having pressure rating equal to or greater than system operating pressure.
- D. Install piping free of sags and bends.

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- E. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
- F. Install fittings for changes in direction and branch connections.

3.3 PIPING INSTALLATION

- A. Water Main Connection: Tap water main with size and in location as indicated according to requirements of water utility.
 - 1. Install tapping sleeve and tapping valve according to manufacturer's installation instructions.
 - 2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
 - 3. Install gate valve onto tapping sleeve. Comply with AWWA C600. Install valve with stem pointing up and with cast-iron valve box.
 - 4. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water service piping.
- B. Comply with requirements of NFPA 24 for materials and installation.
- C. Install ductile-iron pipe and ductile-iron and cast-iron fittings according to AWWA C600.
- D. Install ASTM, NPS polyvinyl chloride (PVC) plastic pipe according to ASTM D 2774.
- E. Bury piping at minimum depth of 30 inches below finished grade or as shown on the construction drawings.
- F. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by jacking and boring.

3.4 ANCHORAGE INSTALLATION

- A. Anchorages: Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
 - 1. Gasketed-Joint, Ductile-Iron Piping: According to AWWA C600.
 - 2. Gasketed-Joint, Polyvinyl Chloride (PVC) Piping: According to AWWA M23.

3.5 VALVE INSTALLATION

- A. General Application: Use mechanical-joint-end valves for 3-inch (80 mm) and larger buried installation. Use threaded- and flanged-end valves for installation

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in pits and inside building. Use nonrising stem UL/FM gate valves for installation with indicator posts. Use bronze corporation stops and valves, with ends compatible with piping, for 2-inch (50 mm) and smaller installation.

- B. AWWA-Type Gate Valves: Comply with AWWA C600. Install buried valves with stem pointing up and with cast-iron valve box.

3.6 FIRE HYDRANT INSTALLATION

- A. AWWA-Type Fire Hydrants: Comply with AWWA M17. Install with gate valve and provision for drainage as indicated.

3.7 PIPE FINISHES

- A. All pipe, valves and fittings used above ground or inside the Water Plant building shall be sandblasted, shop primed and ready to receive a final (field applied) coat of paint. The painting shall be in accordance with Section 09900 and shall be applied with the pipe, valves and fittings empty of any water.

3.8 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests after joints are covered and after thrust blocks have hardened sufficiently.
- B. Hydrostatic Tests: Test at not less than 150 psi for 2 hours. Due to the elevation changes throughout the system, some tests will be required on several shorter lengths that lie in the lower elevations. The Contractor shall consult with the Engineer and develop a "Hydrostatic Pressure Testing Schedule". The Engineer shall approve this schedule prior to testing. The tests shall also include all service taps (up to the curb stop).
- C. Testing equipment shall consist of a water source, pressure pump, a water meter to measure loss, check valve, 250 psi pressure gauge, and associated piping, valves, and fittings. The Contractor shall also provide a pressure recorder to record the pressures during testing. The recorder shall be equipped with a 24-hour chart and shall record pressures up to 250 psi.

1. Permissible Leakage:	<u>gal's/1000'/24 hrs</u>	<u>gal's/1000'/1 hr</u>
a. 2"	03.6	0.15
b. 3"	05.4	0.23
c. 4"	07.2	0.30
d. 6"	10.8	0.45
e. 8"	14.4	0.60
f. 10"	18.0	0.75

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g.	12"	21.6	0.90
h.	14"	25.2	1.05
i.	16"	28.8	1.20
j.	18"	32.4	1.35

- D. Repair piping systems sections which fail required piping test, by disassembly and re-installation, using new materials to the extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.
- E. Should any test of combined sections of pipe laid disclose leakage greater than the specified limit, the Contractor shall, at his own expense, locate and repair the defective joints until the leakage is within the specified allowance.
- F. Water for testing shall be the responsibility of the Contractor. No cost for the water will be imposed, however, the electrical cost associated with pumping the water will be the responsibility of the Contractor.
- G. Pipe may be subjected to hydrostatic pressure, inspected and tested for leakage at any convenient time after partial completion of backfill. The Contractor may test the system with joints exposed or backfilling complete at his option. The Engineer shall be notified at least forty-eight hours before beginning testing.
- H. Drain test water from piping systems after testing and repair work has been completed.
- I. Disinfect water mains and water service piping in accordance with AWWA C651
- J. Test bacteriological quality by submitting to a certified bacteriological laboratory. Two (2) samples for each portion of water mains, at least six (6) hours apart, shall be collected at the locations and spacing as defined in AWWA C651. The Contractor will be responsible for seeing that the collected samples are transported to the certified laboratory in a timely and approved manner.
- K. Prior to placing the water mains into service, approval from the Florida Department of Environmental Protection will be required. Note that no sample results can exceed sixty (60) days prior to submitting to FDEP for certification. From the date the approved bacteriological samples are received by the Engineer, along with the required as-built data, the contract time may be stopped until such time the FDEP approval is obtained. At this point, each Contractor will be required to return to the project and complete final tie-ins and start-up. The Contractor will not be allowed additional cost to remobilize back to the project.

END OF SECTION 02665

SECTION 02702

TEMPORARY BYPASS PUMPING

PART I - GENERAL

1.1 SCOPE

- A. Under this item, the Contractor shall furnish all materials, labor, equipment, power, maintenance, etc. to implement a temporary pumping system for the purpose of diverting the existing flow around the work area for the duration required for the work. The Contractor shall coordinate with Owner a minimum of five days prior to start.
- B. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
- C. The duration of bypass operation are totally determined and controlled by the Contractor as he dictates the means, methods and sequence of construction.

1.2 REQUIREMENTS

- A. Prior to placing the bypass equipment, the Contractor shall provide to the Owner plans and descriptions outlining provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flows. This plan will generally include locations, capacities of equipment, materials and all other incidental items necessary and/or required to ensure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows. No construction shall begin until all provisions have been placed in service by the Contractor.
- B. The CONTRACTOR shall be responsible and liable for any wastewater spills and overflows resulting from improper operation or inadequacy of the bypass system, including reporting to regulatory agencies and paying the resulting fines and penalties and clean up.
- C. The CONTRACTOR shall be responsible for all jobsite, motor vehicle traffic, and general public safety and protection during all work.

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- D. The CONTRACTOR shall provide all trained and experienced labor and supervision for operating and maintaining the pumping and piping systems during the entire bypass pumping operation.
- E. The CONTRACTOR shall be responsible for ensuring proper operation and maintenance of the bypass pumping system.
- F. Any required Maintenance of Traffic Plan (MOT) to conduct the bypass pumping and piping work shall be approved by Bay County and installed and maintained by the CONTRACTOR.
- G. All pumping units shall “residential silenced” and be fitted with proper sound attenuation including enclosures as required for residential settings and shall comply with the City and County noise ordinances. At a minimum, sound levels shall not exceed the Public Nuisance criteria under the Special Project Procedures of these specifications.
- H. All bypass operations shall be properly secured and fenced. The CONTRACTOR shall install temporary barricade around all bypass equipment to restrict access to unauthorized persons. At a minimum, new, 4-foot-high, orange safety fence with “T” stakes a maximum of 10 feet spacing shall be installed and maintained during the entire bypass operation.

PART 2 - EQUIPMENT

2.1 PUMPS

- A. Pump shall be capable of handling raw, unscreened, sanitary sewage containing solids and fibrous materials. Pumps shall be non-clog and shall be capable of passing 3-inch solids.
- B. All pumps used shall be fully automatic self-priming units that do not require the use of foot valves or vacuum pumps in the priming system. The pumps may be electric or diesel powered. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of influent flows.
- C. The Contractor shall provide the necessary stop/start controls for each pump.
- D. The Contractor shall include one standby pump of each size to be maintained on site. Back-up pumps shall be on-line, isolated from the

primary system by a valve.

2.2 DISCHARGE PIPING

- A. Discharge piping shall be adequate to prevent the accidental spillage of flows. Piping shall be in serviceable condition and not be damaged to the point of compromising piping pressure rating. All joints shall be watertight and standard configuration and properly restrained. Discharge hose will be allowed in short sections.

PART 3 - SYSTEM DESCRIPTION

3.1 DESIGN REQUIREMENTS

- A. The Contractor shall provide a bypass pumping system including all pipeline plugs, pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow of the main can be safely diverted around the work area.
- B. The Contractor shall have adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure.
- C. Bypass pumping system shall be capable of bypassing any amount of flow up to full available flow around the work area as necessary for satisfactory performances of work.
- D. System must overcome any existing force main pressure or discharge.

3.2 PERFORMANCE REQUIREMENTS

- A. It is essential to the operation of the existing sewerage system that there be no interruption in the flow of sewage throughout the duration of the project. To this end, the Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and backup units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the sewage flow before it reaches the point where it would interfere with his work, carry it past his work and return it to the existing forcemain downstream of his work.

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- B. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
- C. The Contractor shall provide all necessary means to safely convey the sewage around the work area. The Contractor will not be permitted to stop to impede the main flows under any circumstances.
- D. The Contractor shall maintain sewer flow around the work area in a manner that will not cause surcharging of sewers, damage to sewers and that will protect public and private property from damage and flooding.
- E. The Contractor shall protect water resources, wetlands and other natural resources.

PART 4 - FIELD QUALITY CONTROL AND MAINTENANCE

4.1 INSPECTION

- A. Contractor shall inspect bypass pumping system daily to ensure that the system is working correctly.

4.2 MAINTENANCE SERVICE

- A. The Contractor shall ensure that the temporary pumping system is properly maintained and a responsible operator shall be on hand at all times when pumps are operating.

4.3 EXTRA MATERIALS

- A. Spare parts for pumps and piping shall be kept on site as required.
- B. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

PART 5 - EXECUTION

5.1 PREPARATION PRECAUTIONS

- A. Contractor is responsible for locating existing utilities in the area the Contractor selects to locate the bypass pipelines. The Contractor shall locate his bypass pipelines to minimize any disturbance to existing utilities. All costs associated with relocating utilities and obtaining all approvals

shall be paid by the Contractor.

5.2 INSTALLATION AND REMOVAL

- A. The Contractor shall remove manhole sections or make connections to the existing forcemain and construct temporary bypass pumping structures only as indicated on the Drawings.
- B. Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance of work, it is to be removed in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.
- C. When working inside manhole, the Contractor and Contractor shall exercise caution and comply with OSHA requirements when working in the presence of sewer gases, combustible or oxygen-deficient atmospheres and confined spaces.
- D. The installation of the bypass pipelines is prohibited in all salt marsh/wetland areas. The pipeline must be located off streets and sidewalks and on shoulders of the road. When the bypass pipeline crosses local streets and private driveways, the contractor must place the bypass pipelines in trenches and cover with temporary pavement. Upon completion of the bypass pumping operations, the Contractor shall remove all the piping, restore all property to pre-construction condition and restore all pavements.
- E. The CONTRACTOR shall remove all pumping and temporary bypass systems components and restore any modifications to the existing manholes or structures as directed by the OWNER. Any soil containing grease, oil, or fuel from the pump engines shall be removed from the site, properly disposed of in accordance with all applicable regulations and replaced with topsoil and sodded.
- F. All pavement, grassed and landscaped areas shall be restored to at least pre-construction condition.
- G. The sewer plugs and all appurtenances shall be removed and any damaged to the sewers or other pipes repaired.

END OF SECTION 02702

SECTION 02812 - IRRIGATION REPAIR

PART 1 GENERAL

1.1 System Description

- A. System Requirements:
 - 1. System repair shall follow all manufacturer's recommendations of products used in the system.
 - 2. Provide all materials, labor, transportation, equipment, fees and permits necessary to return the existing irrigation system to a fully operational state in accordance with the plans and specifications.

1.2 Quality Assurance

- A. Contractor shall be a experienced in the repair and installation of irrigation systems. Comply with the applicable requirements of the latest revisions of the following codes and standards:
 - 1. Uniform Plumbing Code
 - 2. National Electric Code
 - 3. National Sanitation Foundation
 - 4. Underwriter's Laboratory
 - 5. All pertinent state and local codes
- B. Manufacturer
 - 1. Provide irrigation equipment produced by the manufacturer as part of a regular product line.
 - 2. Provide all products used in this system from a local, authorized manufacturer's representative.

1.3 Tests

- A. Perform all tests in the presence of the Owner's Representative.
- B. See applicable paragraphs under PART 3 - EXECUTION, this Section.

1.4 Delivery, Handling and Storage

- A. Pack, ship, deliver, receive, handle and store all material in such a manner as to protect from damage due to weather, vandalism, theft and other hazards.
- B. Owner's Representative will designate a storage area for material that will at all times be kept neat and orderly.

PART 2 PRODUCTS

2.1 General

- A. Use only new materials conforming to the standard(s) applicable to each product type and each respective manufacturer.

2.2 Marking flags

- A. Provide new marking flags with the contractor's name and phone number.

2.3 Control Wire and Splices

- A. Control Wire No. 14 AWG solid copper conductor with PVC or PE insulation rated at 600 VA minimum and carrying an embossed or printed Underwriters Laboratory file number indicating UL approval for direct earth burial installation. Wire color as follows:
 - 1. Control wires: red.
 - 2. Common wire: white.
 - 3. Spare wires: blue.
 - 4. Manufactured by Paige Electric Corporation or other approved.
 - 5. Splices. Waterproof underground rated connectors that are UL listed. Splice kits manufactured by 3M Corporation.

2.4 Pipe and Fittings

- A. Mainline pipe below grade: Schedule 40 Bell End pipe. Size to be determined by flow of water through pipe. Do not exceed velocity of 5 feet per second in any pipe. ½" PVC pipe is not acceptable. Manufactured by Cresline or other approved.
- B. Lateral pipe below grade: SDR 21, Class 200 PVC pipe marked "For Rec Water Only" in addition to standard markings and purple in color using Pantone #633. Size to be determined by flow of water through pipe. Do not exceed velocity of 5 feet per second in any pipe. ½" PVC pipe is not acceptable. Manufactured by Cresline or other approved.
- C. Sleeves below grade: PVC Schedule 40. Size to be determined by water lines and wire traveling through sleeves. Provide sleeves 2 pipe sizes larger than pipe within sleeve. A separate sleeve is required to accommodate wires. No sleeves less than 1 ½" inches will be accepted.
- D. Pipe fittings: PVC Schedule 40 manufactured by Spears Manufacturing Company or other approved.
- E. Swing joints for sprinklers: Sprinkler heads with discharge rates of 6.0 gallons per minute (GPM) or less; use 3/8" thick walled poly swing tubing (funny pipe).
- F. Primer and Solvent: Manufactured by Parabond Corporation or other approved.

PART 3 EXECUTION

3.1 General

- A. Examine the site for the conditions under which the work is to be performed. Communicate the existence of any unsatisfactory site condition to the Owner's Representative prior to the commencement of installation. Start of installation means contractor accepts existing site conditions.

- B. Make all field measurement necessary for the work noting the relationship of the irrigation work to the other trades. At each location affected by the installation of the new sewer lines and re-use line, operate the existing irrigation system and make note of its condition. Submit two (2) copies of these notes to the Owner's Representative.
- C. Flag existing heads within the right of way with marking flags. If routing of the existing irrigation system is obvious from the layout of the existing irrigation heads or valves, locate existing lines, cut and cap them prior to waterline trenching.
- D. Protect existing landscaping, hardscaping, structures, utilities, etc. from damage. Damage to any existing entity on the site will be the responsibility of the Contractor.
- E. Contractor's on-site field supervisor must have thorough knowledge of irrigation system repair. Owner's representative must have means of communication with field supervisor through pager or mobile phone for emergency purposes.

3.2 Excavation, Pipe Installation and Backfill

- A. Install sleeving as required by trenching where hardscape features are not in place.
- B. Use chain type trencher set for 4" wide trench minimum for all pipe. Protect all trenches per OSHA regulations.
- C. Provide 12" minimum of cover over mainlines, 8" over lateral lines. If sharp edged debris or rock is encountered, excavate to width and depth required to allow 3" of sand bedding around pipe while maintaining this depth specification.
- D. Cut, fit, and solvent weld pipe and fittings strictly following the manufacturer's guidelines. Allow all joints to cure a minimum of 24 hours prior to applying pressure to the system.
- E. Place backfill in 6" maximum lifts. Place first 6" by hand to exclude debris and all sharp-edged rock of any dimension. Mound soil over trench to allow for settling. Contractor shall be responsible for the repair or restoration of trench settlement in excess of .5".

3.3 Wire Installation

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- A. Lay wire along with and under the mainline with enough slack to avoid pulling wire taut during installation. Pay particular attention to this requirement at all changes in direction.
- B. Provide 24 VAC control wire continuous between the controller and the electric control valve with no splices and with one electric control valve per 24 VAC power wire. Provide 24 VAC common neutral wire with splice allowable in valve boxes only. Provide spare conductor parallel to the common.
- C. Splice 24 VAC wire with UL approved splice kits installed per the manufacturer's instructions. Leave approximately 3' of slack wire at all electric control valves to allow extraction of the solenoid from the valve box without cutting the wire. Coil spare wire neatly in the valve box.

3.4 Testing and Start-Up

- A. Flush all piping in the system prior to installation of sprinkler heads with full utility pressure and flow.
- B. Hydrostatically test all mainline piping at existing static PSI for 4 hours minimum, with a maximum allowable pressure drop of 10% over 4 hours. Repair or replace pipe and fittings as required to successfully complete test. Notify Owner's Representative 72 hours in advance of pressure testing.
- C. Adjust all sprinkler heads for optimum performance and to prevent overspray onto adjacent hardscape features. Verify proper coverage to the intended areas.

3.5 Cleanup and Closeout

Upon completion of daily work, remove all debris relating to system repair and clean adjacent hardscape features as necessary. Upon completion of all irrigation work, remove from the site all leftover material and equipment to leave the site in the same or better condition as when the work was started.

END OF SECTION 02812

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SECTION 02831 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Galvanized-steel chain link fabric.
 - 2. Galvanized-steel framework.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 2 Section "Earthwork" for filling and grading work.
 - 2. Division 3 Section "Cast-in-Place Concrete" for concrete for post footings.

1.3 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data in the form of manufacturer's technical data, specifications, and installation instructions for fence and gate posts, fabric, gates, and accessories.
- C. Shop drawings showing location of fence, gates, each post, and details of post installation, extension arms, gate swing, hardware, and accessories.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has at least three years' experience and has completed at least five chain link fence projects with same material and of similar scope to that indicated for this Project with a successful construction record of in-service performance.
- B. Single-Source Responsibility: Obtain chain link fences and gates, including accessories, fittings, and fastenings, from a single source.

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1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for fences and gates shown on the Drawings in relation to the property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 FABRIC

- A. Selvage: Knuckled on both selvages for 2-inch and 2-1/8-inch mesh sizes with heights of 60 inches and less.
- B. Selvage: Knuckled at one selvage and twisted at the other for 2-inch and 2-1/8-inch mesh sizes and heights above 60 inches.
- C. Selvage: Knuckled on both selvages for mesh sizes less than 2 inches.
- D. Selvage: Knuckled on both selvages.
- E. Selvage: As indicated.
- F. Steel Chain-Link Fence Fabric: Fabricated in one-piece widths for fencing 12 feet and less in height to comply with Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual" and with requirements indicated below:
 - 1. Mesh and Wire Size: 2-inch mesh, 0.148-inch diameter (9 gage).
 - 2. Coating: ASTM A 817, Type 2, Class 1, black vinyl coated.

2.2 FRAMING

- A. Round member sizes are given in actual outside diameter (OD) to the nearest thousandth of inches. Round fence posts and rails are often referred to in ASTM standard specifications by nominal pipe sizes (NPS) or the equivalent trade sizes in inches. The following indicates these equivalents all measured in inches:

<u>Actual OD</u>	<u>NPS Size</u>	<u>Trade Size</u>
1.315	1	1-3/8
1.660	1-1/4	1-5/8
1.900	1-1/2	2
2.375	2	2-1/2
2.875	2-1/2	3
3.500	3	3-1/2

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4.000	3-1/2	4
6.625	6	6-5/8
8.625	8	8-5/8

- B. Type I Round Posts: Standard weight (schedule 40) galvanized-steel pipe conforming to ASTM F 1083, according to heavy industrial requirements of ASTM F 669, Group IA, with minimum yield strength of 25,000 psi, not less than 1.8 oz. of zinc per sq. ft. Type A coating inside and outside according to ASTM F 1234, as determined by ASTM A 90, and weights per foot as follows:

<u>Actual OD</u>	<u>Weight (lb/ft)</u>	<u>NPS Size</u>
1.315	1.68	1
1.660	2.27	1-1/4
1.900	2.72	1-1/2
2.375	3.65	2
2.875	5.79	2-1/2
3.500	7.58	3
4.000	9.11	3-1/2
6.625	8.97	6
8.625	28.55	8

- C. Type II Round Posts: Cold-formed, electric-welded steel pipe conforming to heavy industrial requirements of ASTM F 669, Group IC, with minimum yield strength of 50,000 psi, either protective coating system below according to ASTM F 1234, and weights per foot as follows:

- Coatings: Type B outside with a minimum of 0.9 oz. of zinc per sq. ft. after welding, a chromate conversion coating and a clear polymer overcoat. Type B inside with a minimum of 0.9 oz. of zinc per sq. ft. or Type D inside with a minimum 0.3-mil-thick, 81-percent zinc-pigmented nominal coating.
- Coatings: Type C inside and outside with not less than 0.9 oz. of zinc-5 percent aluminum-mischmetal alloy per sq. ft.

<u>Actual OD</u>	<u>Weight (lb/ft)</u>	<u>NPS Size</u>
1.315	1.35	1
1.660	1.84	1-1/4
1.900	2.28	1-1/2
2.375	3.12	2
2.875	4.64	2-1/2
3.500	5.71	3
4.000	6.56	3-1/2

- D. Roll-Formed Steel: Rolled form steel shapes (e.g., C section) produced from structural-quality steel conforming to ASTM A 570, grade 45, or ASTM A 446, grade D, galvanized, conforming to heavy industrial requirements of ASTM F 669, Group II, with a minimum yield strength of 45,000 psi. Protective coating system according to ASTM F 1234, Type A, hot-dip galvanized with a

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minimum of 2.0 oz. of zinc per sq. ft. according to ASTM A 123, 4.0 oz. of zinc per sq. ft. according to ASTM A 525; or Type C, a minimum of 1.0 oz. of zinc-5 percent aluminum-mischmetal alloy per sq. ft. according to ASTM A 875.

- E. Roll-Formed Steel: Hot-rolled steel shape H section with a minimum yield strength of 45,000 psi conforming to ASTM F 669, group III. Protective coating system according to ASTM F 1234, Type A, hot-dip galvanized with a minimum of 2.0 oz. of zinc per sq. ft. of according to ASTM A 123, or 4.0 oz. of zinc per sq. ft. according to ASTM A 525.
- F. Square Tubing: Cold-formed steel structural tubing conforming to ASTM A 500, Grade B with minimum yield strength of 42,000 psi and not less than 1.8 oz. of zinc per sq. ft. Type A coating inside and outside according to ASTM F 1234, as determined by ASTM A 90.
- G. Top Rail: Manufacturer's longest lengths (17 to 21 feet) with swedged-end or expansion-type coupling, approximately 6 inches long for joining. Provide rail ends or other means for attaching top rail securely to each gate corner, pull, and end post.
 - 1. Round Steel: 1.660-inch OD Type I or II steel pipe.
 - 2. Round Aluminum: 1.660-inch OD aluminum pipe.
 - 3. Round End, Corner, and Pull Posts: 2.375-inch OD Type I or II steel pipe.
 - 4. Roll-Formed Line or Intermediate Posts: 1.875-by-1.625-inch C section weighing a minimum of 2.28 lb per linear ft.
- H. Swing Gate Posts: Furnish posts to support single gate leaf, or one leaf of a double-gate installation, according to ASTM F 900, sized as follows for steel and aluminum pipe posts:
 - 1. Steel posts for fabric height of 6 feet or less and gate leaf width:
 - a. Up to and including 4 Feet: 2.375-inch OD pipe weighing at least 3.11 lb per ft.
 - b. Over 4 to 10 Feet: 2.875-inch OD pipe weighing at least 4.64 lb per ft.
 - c. Over 10 to 18 Feet: 4.000-inch OD pipe weighing at least 8.65 lb per ft.

2.3 FITTINGS AND ACCESSORIES

- A. Material: Comply with ASTM F 626. Mill-finished aluminum or galvanized iron or steel to suit manufacturer's standards.
 - 1. Steel and Iron: Unless specified otherwise, hot-dip galvanize pressed steel or cast-iron fence fittings and accessories with at least 1.2 oz. zinc

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per sq. ft. as determined by ASTM A 90.

- B. Post and Line Caps: Provide weathertight closure cap for each post. Provide line post caps with loop to receive tension wire or top rail.
- C. Post Brace Assembly: Manufacturer's standard adjustable brace. Use material specified below for brace, and truss to line posts with 3/8-inch-diameter rod and adjustable tightener. Provide manufacturer's standard galvanized-steel, cast-iron or cast-aluminum cap for each end.
 - 1. Round Steel: 1.660-inch OD Type I or II steel pipe.
- D. Bottom and Center Rail: Same material as top rail. Provide manufacturer's standard galvanized-steel, cast-iron or cast-aluminum cap for each end.
- E. Tension or Stretcher Bars: Hot-dip galvanized steel with a minimum length 2 inches less than the full height of fabric, a minimum cross section of 3/16 inch by 3/4 inch, and a minimum of 1.2 oz. of zinc coating per sq. ft. Provide one bar for each gate and end post, and two for each corner and pull post, except where fabric is integrally woven into the post.
- F. Tension and Brace Bands: 3/4-inch-wide minimum hot-dip galvanized steel with a minimum of 1.2 oz. of zinc coating per sq. ft.
 - 1. Tension Bands: 0.074 inch thick (14 gage) minimum.
 - 2. Brace Bands: 0.105 inch thick (12 gage) minimum.
- G. Tension Wire: 0.177-inch-diameter metallic-coated steel marcelled tension wire conforming to ASTM A 824 with finish to match fabric.
- H. Tie Wires: 0.106-inch-diameter (12-gage) galvanized steel with a minimum of 0.80 oz. per sq. ft. of zinc coating according to ASTM A 641, Class 3 or 0.148-inch-diameter (9-gage) aluminum wire alloy 1350-H19 or equal, to match fabric wire.

2.4 BARBED WIRE

- A. Barbed Wire Supporting Arms: Manufacturer's standard barbed wire supporting arms conforming to ASTM F 626, metal and finish to match fence framework, with provision for anchorage to posts and attaching three rows of barbed wire to each arm. Supporting arms may be either attached to posts or integral with post top weather cap and must be capable of withstanding 250-lb downward pull at outermost end. Provide following type:
 - 1. Single vertical arm for three strands of barbed wire, one for each corner post.
 - 2. Single 45-degree arm for three strands of barbed wire, one for each line

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post.

- B. Steel Barbed Wire: Two-strand, 0.099-inch-diameter (12-1/2-gage) steel wire with 0.080-inch-diameter (14-gage), four-point barbs spaced not more than 5 inches o.c.; metallic-coated finish to match fabric.
 - 1. Galvanized Finish: Comply with ASTM A 121, chain link fence grade with Class 3 coating with not less than 0.8 oz. of zinc per sq. ft. as determined by ASTM A 90.

2.5 CONCRETE

- A. Concrete: Provide concrete consisting of portland cement per ASTM C 150, aggregates per ASTM C 33, and potable water. Mix materials to obtain concrete with a minimum 28-day compressive strength of 3000 psi. Use at least four sacks of cement per cu. yd., 1-inch maximum size aggregate, 3-inch maximum slump.
- B. Packaged Concrete Mix: Mix dry-packaged normal-weight concrete conforming to ASTM C 387 with clean water to obtain a 2- to 3-inch slump.

2.6 GATES

- A. Fabricate perimeter frames of gates from same material and finish as fence framework. Assemble gate frames by welding. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware, and accessories. Space frame members maximum of 8 feet apart unless otherwise indicated.
 - 1. Fabric: Same as for fence unless otherwise indicated. Secure fabric at vertical edges with tension bars and bands and to top and bottom of frame with tie wires.
 - 2. Bracing: Install diagonal cross-bracing consisting of 5/16-inch-diameter adjustable-length truss rods on gates to ensure frame rigidity without sag or twist.
 - 3. Barbed Wire: Extend end members of gate frames 12 inches above top member and prepare to receive three strands of wire. Provide necessary clips for securing wire to extensions.
- B. Swing Gates: Comply with ASTM F 900.
 - 1. Steel: Gates up to 8 feet wide:
 - a. Up to 6 Feet High: Fabricate perimeter frames of 1.660-inch minimum OD Type I or II steel pipe or 1-1/2-inch-square galvanized-steel tubing weighing 1.84 lb per sq. ft.
 - b. Keeper: Provide a keeper for vehicle gates that automatically engages gate leaf and holds it in the open position until manually

released.

- c. Gate Stops: Provide gate stops for double gates set in concrete, and designed to engage a center drop rod or plunger bar. Include a locking device and padlock eyes as an integral part of the latch, permitting both gate leaves to be locked with a single padlock.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install fence to comply with ASTM F 567. Do not begin installation and erection before final grading is completed, unless otherwise permitted.
 1. Apply fabric to outside of framework. Install fencing on boundary lines inside of property line established by survey as required by Division 1.
- B. Excavation: Drill or hand-excavate (using post-hole digger) holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.
 1. If not indicated on Drawings, excavate holes for each post to minimum diameter recommended by fence manufacturer, but not less than four times the largest cross section of post.
 2. Unless otherwise indicated, excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface.
- C. Setting Posts: Center and align posts in holes 3 inches above bottom of excavation. Space a maximum of 10 feet o.c., unless otherwise indicated.
 1. Protect portion of posts above ground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment, and hold in position during placement and finishing operations.
 - a. Unless otherwise indicated, extend concrete footings 2 inches above grade and trowel to a crown to shed water.
- D. Top Rails: Run rail continuously through line post caps, bending to radius for curved runs and at other posts terminating into rail end attached to posts or post caps fabricated to receive rail. Provide expansion couplings as recommended by fencing manufacturer.
- E. Brace Assemblies: Install braces at end and gate posts and at both sides of corner and pull posts. Locate horizontal braces at midheight of fabric on fences with top rail and at two thirds fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- F. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric

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before stretching fabric and tie to each post with not less than same gage and type of wire. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch-diameter (11-gage) hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c.

- G. Fabric: Leave approximately 2 inches between finish grade and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on security side of fence, and anchor to framework so that fabric remains under tension after pulling force is released.
- H. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not over 15 inches o.c.
- I. Tie Wires: Use wire of proper length to secure fabric firmly to posts and rails. Bend ends of wire to minimize hazard to persons or clothing.
 - 1. Maximum Spacing: Tie fabric to line posts 12 inches o.c. and to rails and braces 24 inches o.c.
- J. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts for added security.
- K. Barbed Wire: Pull wire taut and install securely to extension arms and secure to end post or terminal arms according to manufacturer's instructions.

3.2 GATE INSTALLATION

- A. Install gates plumb, level, and secure for full opening without interference. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary. Install gates according to manufacturer's instructions, plumb, level, and secure.

3.3 ADJUSTING

- A. Gates: After repeated operation of completed installation equivalent to 3 days' use by normal traffic, readjust gates and gate operators and controls for optimum operating condition and safety.

END OF SECTION 02831

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SECTION 02931 - LANDSCAPE REPAIR

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes removal and replacement of landscape material within the City of Panama City Beach Right of Way that interferes with the installation of the reclaimed waterline and/or gravity sewer.
- B. Extent of work includes but is not limited to:
 - 1. Palm tree transplanting
 - 2. Jetting under existing trees
 - 3. Shrub transplanting
 - 4. Root pruning
 - 5. Irrigation repair

PART TWO - PRODUCTS

2.1 ACCESSORIES

- A. Tags: Provide tags for plant material to be transplanted made of white surveyor's marking tape and marked with water proof marker.
- B. Anti-Desiccant: Emulsion providing a protective film over plant surfaces; permeable to permit transpiration
 - 1. Mixed and applied in accordance with manufacturer's instructions.
- C. Mulch: Premium grade clean pine needles,
 - 1. Furnish in bales
- D. Water: Contractor supplied, free of substances harmful to plant growth and transported by hoses or other methods

PART THREE - EXECUTION

3.1 INSPECTION

Examine planting areas and conditions of installation and correct unsatisfactory conditions prior to planting work.

3.2 PREPARATION

- A. Perform planting using experienced workmen familiar with planting procedures under a qualified supervisor

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- B. Locate plants as indicated or as approved in field after staking
 - 1. Do not proceed if obstructions are encountered until alternate plant locations have been selected.
- C. Excavate circular plant pits with vertical sides, except for plants specifically indicated to be planted in beds
 - 1. Provide shrub pits at least 12" greater than diameter of root system and 24" greater for trees.
 - 2. Depth of pit shall accommodate root system
 - 3. Scarify bottom of pit to a depth of 4"
 - 4. Remove excavated materials from site

3.3 TRANSPLANTING

- A. Palm tree transplanting –
 - 1. Tag existing palms within the City of Panama City Beach Right of Way that interfere with the installation of the reclaimed waterline or the gravity sewer.
 - 2. Identify the existing palms to be re-located with station and offset number.
 - 3. Remove all palm fronds, leaving six inches (6") of the main shoot exposed, in the method commonly known as "Hurricane Cut".
 - 4. Use manual or mechanical means to cut and form a minimum root ball of three foot (3') diameter.
 - 5. Use padded chains or straps that will not cut the trunk of the tree during lifting and transplanting.
 - 6. If the tree must be stored temporarily prior to replacement, wrap the rootball with plastic film or wet burlap. Remove plastic prior to planting.
 - 7. Replace the existing palm tree at the same station at a minimum offset of six feet (6') from the edge of pavement.
 - 8. Berm soil 6" high in a 5' diameter ring around the palm tree to create a water retaining basin. Fill the basin with water daily for two weeks after transplanting. Continue watering thereafter as specified in Maintenance.
- B. Shrub transplanting –
 - 1. Tag existing shrubs within the City of Panama City Beach Right of Way that interfere with the installation of the reclaimed waterline.
 - 2. Identify the existing shrubs to be re-located with station and offset.
 - 3. Use manual or mechanical means to cut and form a rootball one-half (1/2) the diameter of the dripline of the shrub.
 - 4. If the shrub must be stored temporarily prior to replacement, wrap the rootball with plastic film or wet burlap. Remove plastic prior to planting.

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5. All transplanting to be done the same day. Do not allow plants to sit more than 24 hours out of the ground.
6. Replace shrubs at the same station and offset.

3.4 ROOT PRUNING

- A. If any roots over 1" diameter are encountered during construction, cut them with a sharp implement and treat the cut end with copper fungicide.

3.5 JETTING OR BORING UNDER EXISTING TREES

- A. Jet or bore under any tree other than a palm tree within the City of Panama City Beach Right of Way that interferes with the installation of the reclaimed waterline.
- B. Directional bore under the tree starting from the edge of the canopy at one side and going to the edge of the canopy on the other side, following the direction of installation of the reclaimed line.

3.6 INSTALLATION

- A. Set plant material in planting pit to proper grade and alignment
 1. Set plants upright, plumb, and faced to give best appearance or relationship to each other
 2. Set plant material 1-2" above finish grade
- B. No backfilling will be permitted around trunks or stems
- C. Backfill pit with planting mixture
 1. Do not use frozen or muddy mixtures for backfilling
 2. Form a ring of soil around edge of each planting pit to retain water
- D. After plants are set, muddle planting soil mixture around bases of balls and fill all voids
- E. Mulching: Mulch tree and shrub planting pits and shrub beds with required mulching material 2" deep, unless noted otherwise, immediately after planting
 1. Thoroughly water mulched areas
 2. After watering, rake mulch to provide a uniform finished surface
- F. Pruning: After planting, prune branches of deciduous stock to balance loss of roots and preserve natural character to particular plant requirements
 1. In general, remove ¼ to 1/3 of leaf bearing buds, proportion shall in all cases be acceptable to Landscape Architect

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2. Remove or cut back broken, damaged, and non-symmetrical growth of new wood
3. Multiple leader plants: Preserve leader which will best promote symmetry of plant
 - a. Cut branches flush with trunk or main branch, at a point beyond a lateral shoot or bud a distance of not less than $\frac{1}{2}$ diameter of supporting branch
 - b. Make cut on an angle
4. Prune evergreens only to remove broken or damaged branches
5. Care of existing trees: Selectively prune existing trees in designated areas, under Landscape Architect's direction
 - a. Remove sucker shoots, dead, rubbing, and damaged branching

3.7 MAINTENANCE

- A. Maintain planting for a period of at least 90 days after completion of operations or until final acceptance of project
- B. Maintenance shall include pruning, cultivating and weeding
- C. Re-set settled plants to proper grade and position
- D. Restore planting saucer and adjacent material and remove dead material
- E. Correct defective work as soon as possible after deficiencies become apparent and weather and season permit
- F. Water thoroughly with a fine mist sprinkler head, soaker hose, or hose at a low flow rate over entire drip line area as required to allow water to penetrate to a depth of 12" to 18"

3.8 ACCEPTANCE

- A. Landscape Architect will perform an Inspection to determine acceptance of planted areas upon Contractor's request
 1. Provide notification at least 10 working days before required inspection
 2. Planted areas will be accepted provided all requirements, including maintenance, have been complied with and plant materials are alive and in a healthy, vigorous condition
- B. Upon acceptance, Property Owner will assume plant maintenance.

END OF SECTION 02931

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SECTION 02960 - RESTORATION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. The work includes the restoration of driveways, lawn areas, trees and plants, roadways, sprinkler systems, walks and any other existing improvement affected by the proposed work.
- B. This section includes furnishing equipment, labor and materials, and performing all necessary and incidental operations to perform the required work.

PART 2 - PRODUCTS

2.1 SOD

- A. The sod shall be Pensacola Bahia, Centipede, or St. Augustine Floratam to match existing adjacent grass, and well matted with grass roots.
- B. The sod shall be sufficiently thick to secure a dense stand of live grass, with a minimum thickness of two (2) inches. The sod shall be live, fresh and uninjured at the time of planting. Sod shall be planted as soon as possible after being dug and shall be shaded and kept moist from the time it is dug until it is planted. The Engineer shall approve the sod before placing.
- C. Any slope steeper than 1 vertical to 3 horizontal shall be sodded and the sod shall be pinned down for stabilization.
- D. The Contractor shall, at his expense, maintain the sodded areas in a satisfactory condition until final acceptance of the project. Such maintenance shall include watering, re-staking sod, filling, leveling and repairing of any washed or eroded areas, as may be necessary.

2.2 PLANTS

- A. Existing damaged plants shall be replaced by plants of equal type, quality and size whenever possible. All new plants shall be sound, healthy, vigorous and free from defects, decay, disfiguring, bark abrasions, plant diseases, insect pests, their eggs or larvae. The new plants shall be approved by the Engineer before placing.
- B. Existing plants may be removed, preserved, and replaced at the

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Contractors option. Plants shall be handled by an approved nursery.

- C. Plants shall be watered and cared for until new growth appears. Dead and dying plants shall be immediately replaced. Plants used shall be in
- D. accordance with the standards for Florida No. 1 or better as given in Grades and Standards for Nursery Plants Part 1.
- E. Plants shall conform to the sizes indicated by the Owner.

2.3 MULCH

- A. Mulch for all planter areas shall be Cypress Bark, clean, bright and free from weeds, moss, sticks, and other debris. Bark size shall no be over 2 1/2 inch diameter.

2.4 WATER

- A. The water used in the performance of this Contract shall be of drinking water quality, clean and free from injurious amounts of oil, acid, alkali, or organic matter.

2.5 PLANTING MIXTURE:

- A. The 18 inch planting mixture, when required, shall consist of a thorough mixture of 40% peat and 60% sand. The peat shall be Florihome peat or equivalent and the sand shall be clean and free from debris of any kind.

2.6 FERTILIZER

- A. Fertilizer shall be pelletized 8-8-8, or approved equal.

2.7 ASPHALTIC CONCRETE

- A. Asphaltic concrete for surface and base course applications shall be as specified elsewhere in these contract documents.

2.8 PORTLAND CEMENT CONCRETE

- A. Portland cement concrete used in the performance of this Contract shall have a compressive strength of 3000 psi at 28 days and shall conform to the requirements of Section 03301.

PART 3 - EXECUTION

3.1 LANDSCAPING RESTORATION

- A. Lawn Areas: Any lawn area affected by the required work shall be restored to a condition equal or better than the conditions existing before the commencement of work.
- B. Balled Plants: Plants where required shall be adequately balled with firm natural balls of soil, sized as set forth in "Horticultural Standards." Balls shall be firmly wrapped with burlap or equally approved strong cloth. No balled plant will be planted if the ball is cracked or broken before or during the process of planting.
- C. Preparation of Plant Pits: All plant pits shall be circular in outline and have vertical sides. Tree pits shall be two feet wider than the width of the ball and one foot deeper than the depth of the ball. Shrubs that are either B&B or 3 gallons + shall have pits that are two feet wider than the width of the plant ball and 6 inches deeper than the depth of the ball. Smaller shrubs shall have pits that are at least one foot wider than the width of the plant ball and 6 inches deeper than the ball depth.
- D. Setting Plants: All plants except as otherwise specified, shall be centered in pits. Deep planting shall be avoided and unless otherwise specified, plants shall be set at such a level that after settlement they will bear the same relation to the required grade as they have to the natural grade before being transplanted.
- E. Balled and burlapped plants and palm trees shall be placed on 6 inch to 12 inch of tamped planting mixture and adjusted so as to be at the proper level. The rope and burlap shall be cut away and the burlap folded down to the bottom of the pit. Very large B&B plants shall remain wrapped until fully backfilled and then just the upper portion of the burlap shall be removed. Backfill of planting mix shall be placed halfway up the pit and then water tamped. After this water has drained away, backfill around the ball to grade and water tamp again. Finally, form a ridge of soil around the edge of the pit to form a saucer and fill area three times with water.
- F. Water: Water to be used initially during plant installation shall be furnished by the Contractor. The existing irrigation system, where damaged, shall be promptly repaired after the installation of the plants.
- G. Options as to Methods: Any plant may be furnished container grown instead of balled if all other requirements are met.
- H. Immediately before sod is placed, 8-8-8 fertilizer shall be applied at the rate of approximately 500 pounds per acre, by broadcasting and raking into the planting area.

- I. Sod shall be firmly embedded by light tamping. Wherever necessary to prevent an erosion condition caused by vertical edges at the outer limits of the sodded area, the sod shall be tamped so as to produce a featheredge at the outer limits. The sod shall be kept in a moist condition after it is planted. Water shall not be applied between the hours of 8 A.M., and 4 P.M., nor when there is danger of freezing.
- J. The Contractor shall, at his expense, maintain the planted areas in a satisfactory condition until final acceptance of the project. Such maintenance shall include watering, filling, leveling and repairing of any washed or eroded areas, as may be necessary.

3.2 PAVEMENT REPLACEMENT

- A. Asphalt pavement shall be removed by saw cutting on a straight line with edges as vertical as possible. Concrete pavement or asphalt surfaced concrete shall be removed by cutting with a concrete saw in as straight a line and vertically as possible.
- B. Prior to replacing concrete or asphalt pavement replacement, a limerock base shall be laid. The base for concrete pavement shall be six (6) inches of compacted thickness, and that for asphalt pavement shall be eight (8) inches of compacted thickness for City driveways. For County roads the thickness shall be as required by the County permit. The base course for each shall be compacted in two equal layers to a minimum of 98% of the maximum density as determined by AASHTO, Method T-180. The Owner will have tests made by an independent testing laboratory to verify compaction results.
- C. Non-asphalt pavement replacement shall be replaced of like material and thickness. Asphalt or built-up asphalt pavement replacement shall be replaced with like material or concrete as directed by the Engineer. Where asphalt or built-up asphalt pavement is replaced by concrete, the concrete shall have a minimum of six (6) inches in thickness and be reinforced with 6 by 6 No. 6 gage welded wire fabric. Where the pavement replacement is of like material, it shall be replaced in thickness equal to or better than that existing at the time of removal.
- D. Road cuts across County roads shall be repaired with a temporary asphalt patch the same day as cut and maintained for a period of 90 days prior to placing the final wearing surface.
- E. Unless the base is sealed or other temporary paving applied over driveway areas to be repaved, pavement shall be replaced not later than three weeks after completion of backfill.

3.3 CURB REMOVAL AND REPLACEMENT

- A. Curb removal and replacement required in the construction of this work shall be done by the Contractor. Reasonable care shall be exercised in removing the curb, and the Contractor shall either stockpile or dispose of this material as directed by the Engineer. Curb shall be replaced of like material in a manner and condition equal to or better than that existing at the time of removal. Materials and methods of replacing State Highway sidewalks or curbs shall conform to the Department of Transportation specifications.

3.4 TESTS
(Omitted)

END OF SECTION 02960

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SECTION 02999 - MISCELLANEOUS WORK AND CLEANUP

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This Section includes items and operations which are not specified in detail as separate items but can be sufficiently described as to the kind and extent of work involved. The Contractor shall furnish all labor, materials, equipment and incidentals necessary to complete all work under this Section.
- B. The work of this Section includes, but is not limited to the following:
 - 1. Restoring sidewalks, curbing and gutters and any other existing items damaged or destroyed.
 - 2. Crossing utilities.
 - 3. Restoring easements (servitude) and right-of-way.
 - 4. Water and sewer services.
 - 5. Storm sewer facilities.
 - 6. Driveway restoration.
 - 7. Cleaning up.
- C. All work performed by the Contractor that is not listed for payment in other bid items shall be included under MISCELLANEOUS CONSTRUCTION.

1.2 SUBMITTAL OF LUMP SUM BREAKDOWN (NOT USED)

1.3 WORK SPECIFIED UNDER OTHER SECTIONS

- A. All work shall be completed in a workmanlike manner by competent workmen in full compliance with all applicable sections of these Specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials required for this Section shall be of at least the same type and quality as materials that are to be restored. Where possible, the Contractor shall reuse existing materials that are removed and then replaced, with the exception of corrugated metal pipe, paving and grassing.

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PART 3 - EXECUTION

3.1 RESTORATION OF CURBING, GUTTERS AND SIDEWALK

- A. Existing curbing, gutters, and sidewalk to remain shall be protected. Curbing and sidewalk which are damaged during construction shall be replaced with materials of equal quality and dimension at no additional cost.
- B. At several locations it may be necessary for the Contractor to remove, store and replace existing fences and guard rails during construction. Only the sections directed by the Engineer shall be removed. If any section of the fence or guard rail is damaged due to the Contractor's operations, it shall be replaced with material equal to or better than that damaged, and the work shall be satisfactory to the Engineer.
- C. Road crossings shall be restored in accordance with the respective sections of the Contract Specifications.

3.2 CROSSING UTILITIES AND COORDINATION

- A. This item shall include any extra work required in crossing water courses, drains, water mains, sewer mains, and other utilities, including all sheeting and bracing, concrete, extra excavation and backfill, or any other work required for the crossing, whether or not shown on the drawings including coordination.

3.3 RESTORING PRIVATE PROPERTY AND PUBLIC RIGHT-OF-WAY

- A. The Contractor shall be responsible for all damage to private property and public right-of-way due to his operations. He shall protect from injury all walls, fences, shrubbery, pavement, walks, underground facilities, such as water pipe and irrigation systems, or other utilities which may be encountered. If removal and replacement are required, it shall be done in a workmanlike manner so that the replacement is equivalent to that which existed prior to construction.
- B. Existing lawns outside the right-of-way limits damaged by construction shall be regraded and resodded with like sod. These areas shall be maintained until all work under this Contract has been completed and accepted. No separate payment will be made for restoration work outside the right-of-way and payment limits.

3.4 WATER AND SEWER SERVICES

- A. The Contractor shall repair any and all water and sewer services damaged

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by his operations.

3.5 STORM SEWER FACILITIES

- A. Storm drainage piping, structures and other facilities to remain in the vicinity of the work shall be protected from damage. Any item damaged during construction of the project shall be replaced with the item(s) equal to or better than existing before construction.

3.6 DRIVEWAY RESTORATION

- A. The Contractor shall restore all driveways damaged by his operation and shall match the existing driveway material, shape and dimension unless the driveway will be replaced. Existing driveways shall be saw cut prior to excavation.

3.7 CLEAN-UP

- A. The Contractor shall remove all construction material, excess excavation, buildings, equipment and other debris remaining on the job as a result of construction operations and shall render the site of the work in a neat and orderly condition acceptable to the Owner and the Engineer. All areas disturbed during construction that is not listed for payment in other bid items or this section shall be restored by the Contractor at his sole expense as directed by the Engineer.

3.8 INCIDENTAL WORK

- A. Do all incidental work not otherwise specified, but obviously necessary for the proper completion of the Contract as specified and as shown on the drawings.

END OF SECTION 02999

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SECTION 03301 - CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. The extent of concrete work is shown on the drawings.

1.2 CODES AND STANDARDS

- A. ACI 347 "Recommended Practice for Concrete Formwork"; ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete"; comply with applicable provisions.
- B. Reference to standard specifications herein shall be construed as to be in reference to the latest revision or edition.

1.3 STORAGE

- A. Immediately upon receipt at the site, cement that is to be site mixed shall be stored in a dry, weather tight building, properly ventilated and with provisions for prevention of moisture absorption.
- B. Reinforcing shall be protected from the weather.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: Cement shall conform to standard specifications for "Portland Cement", ASTM C150, Type II, except Type I may be used on sidewalks and curbs.
- B. Aggregate: Concrete aggregate shall conform to the current specifications for "Concrete Aggregate", ASTM Designation C33.
- C. Water: Water used in mixing concrete shall be fresh, clean, and free from injurious amounts of oil, acid, alkali or organic matter.
- D. Ready-Mix Concrete: Ready-mixed concrete may be used at the option of the Contractor provided that such concrete meets the requirements of these specifications and of ASTM Designation C94 for "Ready-Mixed Concrete".

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- E. High-Early-Strength Concrete: Concrete made with high-early-strength Portland cement shall be used only when specifically authorized by the Engineer. The 7-day compressive strength of concrete made with high-early-strength cement shall be at least equal to the minimum 28-day compressive strength specified. All provisions of these specifications shall be applicable to high-early-strength concrete except the cement shall conform to ASTM Designation C150, Type III.

2.2 RELATED MATERIALS

- A. Reinforcing: Deformed Reinforcing Bars, ASTM A615; Grade 60 unless otherwise indicated.
- B. Welded Wire Fabric: ASTM A185.
- C. Liquid Membrane-Forming Curing Compound: ASTM C309, Type I.
- D. Form Materials:
 - 1. Provided form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.
 - 2. Exposed Concrete Surfaces: Suitable material to suit project conditions.
- E. Waterstops: To be used in joints shall be #10 gage steel sheet, 4-inches wide, welded continuous through the joint, unless detailed otherwise.
- F. Chemical Floor Hardener: Colorless aqueous solution containing a blend of magnesium fluorosilicate and zinc fluorosilicate combined with a wetting agent, containing not less than 2 lbs. Of fluorosilicates per gallon.
 - 1. Apply to exposed concrete slabs not indicated or scheduled to receive subsequent finishes.

2.3 QUALITY

- A. Strength: The minimum 28-day compressive strength of reinforced concrete shall be 3,000 psi, unless shown otherwise on the drawings.
 - 1. Each cubic yard of 3,000 psi concrete shall contain no less than 480 lbs. of cement. The total water content per bag of cement shall not exceed 6.5 gallons.
- B. Mix Proportions: All concrete materials shall be proportioned so as to produce a workable mixture with a slump between 2-inches and 4-inches.
- C. Tests:
 - 1. The Contractor shall provide, for test purposes, one set of three

cylinders taken from each day's pour of each 100 yards placed, whichever is least or as directed by the Engineer. Test samples shall be supplied by the Contractor at his expense and tests will be made by an independent testing laboratory at the Contractor's expense. The standard age of test shall be 28 days; but, when approved by the Engineer, 7 day tests may be used provided that the relation between the 7 and 28-day strengths of the concrete is established by test for materials and proportions used. If the test strength of the cylinders falls below the minimum allowable compressive strength, the Engineer shall have the right to order the Contractor to remove and renew that day's pour of concrete or the Contractor shall accept such deductions in the final payment as the Owner may deem reasonable.

2. Sampling and testing of concrete materials shall be made in accordance with ASTM Designations. Test samples shall be supplied by the Contractor at his expense, and tests shall be made by an independent testing laboratory at the Owner's expense. The source from which concrete aggregates are to be obtained shall be selected by the Contractor well in advance of the time when they will be required in the work; and suitable samples, as they are to be used in the concrete, shall be furnished in advance of the time when the placing of the concrete is expected to begin.

PART 3 - EXECUTION

3.1 FORMING AND PLACING CONCRETE

- A. Formwork: Construct so that concrete members and structures are of correct size, shape, alignment, elevation and position, complying with ACI 347.
- B. Clean and adjust forms prior to concrete placement. Apply form release agents for wet forms, as required. Retighten forms during and after concrete placement if required to eliminate mortar leaks.

3.2 REINFORCEMENT

- A. Position, support and secure reinforcement against displacement. Locate and support with metal chairs, runners, bolsters, spacers and hangers, as required. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- B. Install welded wire fabric in lengths as long as possible, lapping at least one mesh.

- C. Installation of Embedded Items: Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by cast-in-place concrete. Use setting diagrams, templates and instructions provided by others for locating and setting.

3.3 CONCRETE PLACEMENT

- A. Comply with ACT 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.
- B. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into all parts of the forms.
- C. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement and curing. Concrete shall not be placed when the surrounding air temperature is below 40 degrees F. and dropping.
 - 1. In cold weather comply with ACI 306
 - 2. In hot weather comply with ACI 305.

3.4 CONCRETE FINISHES

- A. Trowel Finish: Apply trowel finish to monolithic slab surfaces that are to be exposed-to-view, unless otherwise shown, and slab surfaces that are to be covered with resilient flooring or carpeting.
 - 1. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand troweling operation, free of trowel marks, uniform in texture and appearance, and with a surface plant to tolerance not exceeding 1/8-inch in 10-feet when tested with a 10-foot straightedge. Grind smooth surface defects which would telegraph through applied floor covering system.
- B. Nonslip Broom Finish: Apply nonslip broom finish to exterior concrete and sidewalks.
 - 1. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with the Engineer before application.
- C. Curbs: Provide monolithic finish to curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with

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corners, intersections and terminations slightly rounded. Replacement to match shape of adjoining curbs.

3.5 BONDING AND GROUTING

- A. Before depositing new concrete on or against concrete that has set, existing surfaces shall be thoroughly roughened and cleaned of glaze, foreign matter, and loose particles. An epoxy coating shall be applied for bonding the new concrete to the old.

3.6 CURING

- A. Concrete shall be kept continuously (not periodically) wet for a period of at least five consecutive days by covering with water or with an approved water saturated covering. Water for curing shall be clean and free from any elements which might cause staining or discoloration of the concrete surface.
- B. Sidewalks and floor slabs may be cured by spraying with a Membrane-Forming curing compound, applied as per manufacturer's recommendations. This material shall not be used on any interior slabs to which an applied finish is to be bonded.

3.7 PATCHING

- A. Any concrete which is not formed as shown on the drawings, or is out of alignment or level or shows a defective surface, shall be considered as not conforming with the intent of these specifications and shall be removed from the job by the Contractor at his expense, unless the Engineer grants permission to patch the defective area. This shall be done in accordance with the procedures above. Honeycomb consisting of 3/4-inch diameter holes or greater shall be considered a defective surface. Permission to patch any such area shall not be considered a waiver of the Engineer's right to require complete removal of the defective work if the patching does not, in his opinion, satisfactorily restore the quality of the concrete and appearance of the surface.
- B. As the forms are removed, fins, rough edges, and offsets shall be ground smooth. Holes to 3/4-inch, slight honeycomb, and minor defects shall be wet and filled with a 1:2 mix of cement mortar, matching color of surrounding concrete, and then troweled to a uniform plane. As soon as they have been troweled, the patched areas shall be sprayed with a curing compound which will not destroy future bonding properties. Three days after application of curing compound, the entire surface shall be finished by wetting and applying a 1:2 mix of cement mortar with a cement brick.

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Using the brick, mortar shall be rubbed into pits or indentations and excess mortar rubbed off to provide a uniformly textured surface. When the surface has dried, all loose sand and dust shall be removed and the surface then hosed down with water.

3.8 TOLERANCES

- A. Tolerances for concrete work shall be in accordance with ACI-347.

END OF SECTION 03301

SECTION 09704 – CONCRETE PROTECTIVE COATING - SPECTRASHIELD

PART 1 - GENERAL

1.1 PRODUCT DESCRIPTION

- A. The chemical resistant lining system shall be a spray-applied multi-component surfacing system for use in both new construction and rehabilitation of sanitary sewer structures such as headworks, lift stations, wet wells, etc. THE COATING SHALL BE SPECIFICALLY RESIST THE EFFECTS OF HYDROGEN SULFIDE AND BYPRODUCTS. The lining system shall be the following product:
 - 1. SPECTRASHIELD, by CCI Spectrum, Inc., nominal 500 mil total thickness or pre-approved equal
- B. Equal products must be approved a minimum of four weeks prior to initial application. This specification is for a multi-component Primer Modified Polymer moisture barrier, Polyurethane Polymeric blend foam surfacer and final Modified Polymer topcoat.
- C. Prior pre-approved is required to determine if the prospective product may be bid for this project. Without prior pre-approval within the specified timeframe a product may be rejected as unacceptable. This timeframe allows the Owner's Representative ample time to determine if the proposed product is an acceptable alternative.

1.2 INTERIOR SURFACE SYSTEM

- A. This specification covers work materials, equipment and tools including specially developed application equipment as required for installation and testing of a field applied unique monolithic chemical resistant surfacing system.
- B. The use of specialized application equipment combined with rigorous surface preparation requirements shall be used to apply the products without the use of solvents. The equipment adds high heat and pressure to the monolithic surfacing system resulting in a high build and quick set of the completed system.
- C. Product application requirements and procedures described include surface preparation, mixing, application, material handling and storage, qualification of the applicator and application quality control.

1.3 QUALITY ASSURANCE

A. REQUIREMENTS:

1. Do not use or retain contaminated, outdated, or diluted materials for resurfacing. Do not use materials from previously opened containers.
2. Use only products of the approved Manufacturer. Use products of one manufacturer in any one resurfacing system with compatible materials. Provide same material product for touch-up as for original material. If any requirements of this specification conflict with a referenced standard, the more stringent requirement shall apply.
3. Make available all locations and phases of the work for access by the Engineer or other personnel designated by the Engineer. The Contractor shall provide ventilation and egress to safely access the coating work areas for inspection.
4. Conduct work so that the lining system is installed as specified herein. Inspect work continually to ensure that the surfacing system is installed as specified herein. The Contractor shall inspect the work to determine conformance with the specifications and referenced documents. The Contractor shall inform the Engineer of the progress and the quality of the work through daily reports as specified below. Any nonconforming coating system work shall be corrected as specified herein or as recommended by the Manufacturer.
5. Summarize test data, work progress, areas covered, ambient conditions, quality control inspection test findings, and other information pertinent to the resurfacing system installation in daily reports to be submitted to the Engineer or the Engineer's Representative.
6. The methods of construction shall be in accordance with all requirements of this specification.
7. Employ only trades people who have at least three years of experience performing resurfacing work of similar size and complexity as the work specified in this Section. Submittals to verify these qualifications are to be made within thirty (30) days of the Notice-to-Proceed and are subject to approval by the Engineer.
8. Specified System is the minimum standard of quality for this project. Submissions of alternative manufacturers shall be approved by the Engineer and owner in writing ten days prior to bid date.

B. CONTRACTOR QUALIFICATIONS

1. Applicator: The applicator shall be trained and certified by the manufacturer for the handling, mixing, application and inspection of the liner system.
2. Contractor Experience: Contractor shall have a minimum 5 years experience lining concrete sewer collection system components such as

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manholes, lift stations, headworks and piping. Contractor shall provide documentation verifying that they meet the experience requirements.

1.4 SUBMITTALS

- A. Submit the following prior to commencing with any phase of the work covered by this Section:
1. Manufacturer's current printed recommendations and product data sheets for all coating system products supplied under this section including performance criteria, surface preparation and applications, volatile organic compound (VOC) data, and safety requirements.
 2. Material Safety Data Sheets (MSDS) for any materials brought on-site including all resurfacing system materials, solvents, and abrasive blast media.
 3. Storage requirements including temperature, humidity, and ventilation for resurfacing system materials.
 4. Manufacturer's requirements, including application procedures for resurfacing materials, shall be in writing and shall be followed in detail. All safety precautions recommended by the Manufacturer shall be strictly adhered to at all times when work is in progress.
 5. Color samples for all surfaces to be surfaced that have been field-matched to existing colors.
 6. Submit applicator's certification that resurfacing materials comply with Federal, State, and Local regulations for VOC (Volatile Organic Compounds).
 7. Submit daily reports that contain the following information: substrate conditions, ambient conditions, application procedures, work completed and location thereof. Mark-up drawings that show location of work.
 8. Submit letter(s) with associated product data signed by Manufacturer certifying that submitted products are suitable for application on the surfaces to be surfaced and for the service conditions.

1.5 DELIVERY AND STORAGE

- A. Materials shall be stored in accordance with Manufacturer's recommendations in enclosed structures and shall be protected from weather and adverse temperature conditions. Flammable materials shall be stored in accordance with state and local codes. Materials exceeding storage life recommended by the manufacturer shall be removed from the site.
- B. Store all materials only in area or areas designated by the Engineer solely for this purpose. Confine mixing, thinning, clean-up and associated operations, and storage of materials-related debris before authorized disposal, to these

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areas. All materials are to be stored on pallets or similar storage/handling skids off the ground in sheltered areas in which the temperature is maintained between 50°F and 90°F.

- C. Mix all surfacing materials in an enclosed mixing area designated by the Engineer. This enclosed area must protect the mixing operation and materials from direct sunlight, inclement weather, freezing, or other means of damage or contamination. Protect all other concrete and metallic surfaces and finishes from any spillage of material(s) within the mixing area.
- D. Do not use floor drains, dikes or storm drains for disposal of surfacing system materials.
- E. The Contractor shall take all precautions and implement all measures necessary to avert potential hazards associated with the resurfacing system materials as described on the pertinent Material Safety Data Sheets or container labels.
- F. Deliver all materials to the jobsite in their original, unopened containers. Each container shall bear the Manufacturer's name and label.
 - 1. Labels on all material containers must show the following information:
 - a. Name or title of product.
 - b. Federal Specification Number if applicable.
 - c. Manufacturer's batch number and date of manufacture.
 - d. Manufacturer's name.
 - e. Generic type of material.
 - f. Application and mixing instructions.
 - g. Hazardous material identification label.
 - h. Shelf life date.
 - i. Storage requirements.
 - 2. All containers shall be clearly marked indicating any personnel safety hazards associated with the use of or exposure to the materials.
 - 3. All materials shall be handled and stored to prevent damage or loss of label.
 - 4. Surfacing material storage and mixing areas shall be designated by the Engineer.
 - 5. Do not use or retain contaminated, outdated, prematurely opened, diluted materials, or materials which have exceeded their shelf life.

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1.6 COORDINATION OF WORK

- A. WORK AREAS: The work areas on the jobsite will be designated by the Engineer. The Contractor's personnel shall not be permitted in any area other than those expressly designated by the Engineer.
- B. COORDINATION: The contractor shall coordinate with the Engineer regarding availability of work areas, completion times, safety, access and other factors which can impact plant operations.

1.7 SAFETY

- A. The Contractor's work forces should comply with the provisions outlined in the following documents:
 - 1. SSPC-PA-3 "A Guide to Safety in Paint Application"
 - 2. NACE Pub. "A Manual for Painter Safety"
- B. The Contractor shall provide personnel with all safety equipment necessary to protect them during any phase of the work. This shall include, but not be limited to, safety glasses, goggles, earplugs, hard hats, steel toed work shoes, appropriate personal protective clothing, gloves, and plant approved escape respirators (where required).
- C. No work shall be performed until the appropriate Work Requests and Lockouts are approved by the Engineer. The Work Request system provides a mechanism to advise plant staff of a contractor's work activities. The Lockout system is a safety procedure to prevent unintended equipment activation.
- D. Keep any flammable materials such as cleaning solvents, thinners, or resurfacing materials away from open flames, sparks or temperatures higher than 120°F. Drums containing flammable materials will be grounded. No solvent in any quantity shall be allowed inside containment enclosures or permitted confined spaces at any time during resurfacing work.
- E. Power tools are to be in good working order to avoid open sparking. No spark producing tools shall be utilized in restricted areas as indicated herein.
- F. The Contractor shall fireproof all work areas by maintaining a clean work area and having Underwriter's Laboratories approved fire extinguishers on-hand. The Contractor shall furnish these fire extinguishers.
- G. Workers doing abrasive blasting operations shall wear a fresh air supplied protective helmet and hood and personal protective clothing acceptable to industry standards and all government regulations.

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- H. Dispose of rags used for wiping up resurfacing materials, solvents, and thinners by drenching them with water and placing in a metal container with a tight fitting metal cover. Complete this disposal process at the end of each day. Final disposal of these materials is the Contractor's responsibility.
- I. Matches, smoking, flames, or sparks resulting from any source including welding, must be remote from the work area during coating work. Smoking is permitted only in designated areas of the plant.

PART 2 - COATING SYSTEMS

2.1 CONCRETE PROTECTIVE COATING SYSTEMS

- A. Components of Concrete Tankage to receive protective coatings are indicated on the Drawings.
- B. Sanitary Sewer Manholes/Wetwell structures, new and those existing so designated, are to receive the SpectraShield Coating System.

PART 3 - EXECUTION

3.1 PRE-COAT INSPECTION

- A. Joints, lift holes and walls shall be made smooth and suitable for application of the interior surfacing system.
- B. Installation of the protective coating shall not commence until the concrete substrate has properly cured. New Concrete is to be cured a minimum of 28 days.
- C. The cured surfacing shall be monolithic with proper sealing connections to all unsurfaced areas and shall be placed and cured in conformance with the recommendations of the monolithic surfacing system manufacturer.
- D. When cured, the system shall form a continuous, tight-fitting, hard, impermeable surfacing that is suitable for sewer system service and chemically resistant to any chemicals, bacteria or vapors normally found in domestic sewage.
- E. The system shall be compatible with the thermal conditions of the existing sanitary sewer surfaces.

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- F. The Contractor shall submit construction procedures, technical specifications, manufacturer's recommendations and quality control procedures to the Engineer prior to approval.

3.2 GENERAL

A. HOISTING, SCAFFOLDING, STAGING, AND PLANKING:

1. Provide, set-up, and maintain all required hoists, scaffolds, and staging and planking, and perform all access related hoisting work required to complete the work of this section as indicated and specified.
2. Scaffolds shall have solid backs and floors to prevent dropping materials from there to the floors or ground below.

B. ENVIRONMENTAL REQUIREMENTS:

1. Comply with the Manufacturer's recommendations as to environmental conditions including external dewatering to eliminate hydrostatic pressure/moisture under which resurfacing system materials can be applied.
2. Do not apply resurfacing system materials when dust is in work site.
3. The Contractor shall provide all temporary lighting during the work.

C. PROTECTION:

1. Cover or otherwise protect finish work or other surfaces not being surfaced.
2. Erect and maintain protective tarps, enclosures and/or maskings to contain debris (such as dust or airborne particles resulting from surface preparation) generated during any and all work activities. This includes, but is not limited to, the use of dust/debris collection apparatus as required.

D. INITIAL INSPECTION OF SURFACES TO BE COATED:

It is the responsibility of the Contractor to inspect and report unacceptable concrete substrate surface conditions to the Engineer prior to the commencement of surface preparation activities. Unacceptable surface conditions are defined as the presence of cracked surfaces or concrete deteriorated to a depth of greater than 1" or otherwise unable to withstand surface preparation as specified herein.

E. THINNERS AND SOLVENTS:

1. The Contractor shall use only solvents and thinners as recommended by the Manufacturer.

3.3 SURFACE PREPARATION REQUIREMENTS

A. GENERAL:

1. All specified surface preparation shall be performed in accordance with the latest version of the SSPC, NACE, ICRI and other standards referenced in this section.
2. Active water infiltration shall be stopped by using a cementitious water plug or hydroactive grout that is compatible and suitable for topcoating with the specified monolithic surfacing system.
3. Oil and grease shall be removed before mechanical cleaning is started via an alkaline-based emulsifying detergent as recommended by the resurfacing material manufacturer. Where mechanical cleaning is accomplished by blast cleaning, the abrasive used shall be washed, graded and free of contaminants that might interfere with the adhesion of the resurfacing materials (Reference SSPC-SP13/NACE No. 6).
4. Verify that the pH of the cleaned concrete surfaces to be coated is within the range of to 8 to 11. Application of coating materials outside this range will not be permitted without written approval from the Engineer.
5. Concrete surfaces shall be abraded to produce a minimum surface profile of a CSP-5 as noted in ICRI Guideline 03732. This preparation will be followed by vacuum cleaning to remove all dust, dirt or friable substances leaving clean, dust free surfaces for resurfacing as detailed in SSPC-SP 13/NACE No. 6).
 - a. Used or spent blast abrasive shall not be reused on work covered by this section.
 - b. The compressed air used for blast cleaning will be filtered free of condensed water or oil. Moisture traps will be cleaned at least once every four hours or more frequently as is appropriate.
 - c. Oil separators shall be installed just downstream of compressor discharge valves and at the discharge of the blast pot discharges. Oil separators shall be cleaned at least once every four hours or more frequently as is appropriate.
 - d. A paper blotter test shall be performed by the Contractor when requested by the Engineer or the Engineer's representative to determine if the air is sufficiently free of oil and moisture (Reference ASTM D4285).
 - e. Regulators, gauges, filters, and separators will be in good working order for all of the compressor air lines to blasting nozzles at all times during this work.

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- f. An air dryer or drying unit shall be installed which dries the compressed air prior to blast connections. This dryer shall be used and maintained for the duration of surface preparation work.
- g. The quality, volume, and velocity of life support and ventilation air used during surface preparation shall be in accordance with applicable safety standards and as required to ensure adequate visibility and proper dissipation of volatiles without impacting the prepared surface or the health of the public or personnel working for the Contractor, Subcontractors, Engineer, Engineer's representatives, or anyone who may be affected by on-site maintenance coating work activities.
- h. The abrasive blast nozzles used shall be the venturi or other high velocity type supplied with the minimum air pressure and the necessary volume to obtain the required specified degree of cleanliness.
- i. The Contractor must provide adequate ventilation for airborne particulate evacuation and lighting (meeting all pertinent safety standards) to optimize visibility for both blast cleaning and observation of the substrate during surface preparation work.
- j. All phases of surface preparation work specified herein must be inspected by the Engineer before the Contractor proceeds with the subsequent phase of surface preparation.

3.4 APPLICATION REQUIREMENTS

A. GENERAL

- 1. Areas not to be surfaced shall be masked using duct tape or other protection materials to prevent these surfaces from being surfaced.
- 2. Ensure straight, even termination of resurfacing/topcoat materials on wall edges and flush with embedded steel.
- 3. The Contractor must follow the minimum and maximum recoat limitation times and related temperature range restrictions between successive lifts for all products specified herein per Manufacturer's stated requirements.
- 4. All equipment and procedures used for resurfacing system application shall be as recommended by the Manufacturer.
- 5. Unless specified elsewhere herein, the Contractor shall comply with the Manufacturer's most recent written instructions with respect to the following:
 - a. Mixing of All Materials.
 - b. Protection and Handling of All Materials.
 - c. Recoat Limitation and Cure Times.
 - d. Minimum Ambient and Substrate Temperatures, Substrate's Degree of Dryness, Relative Humidity, and Dew Point of Air.
 - e. Application.

- f. Final Curing.
 - g. Use of Proper Application Equipment.
6. Curing of Chemical Resistant System: The applied resurfacing system shall be protected from damage during curing and shall be cured as recommended by the Manufacturer. Ambient conditions shall be controlled by the Contractor during curing to ensure the minimum air temperature and minimum relative humidity as required by the Manufacturer is maintained.

3.5 FIELD QUALITY CONTROL INSPECTION AND TESTING

- A. Inspection by the Engineer or others does not limit the Contractor's responsibilities for quality control inspection and testing as specified herein or as required by the Manufacturer's instructions.
- B. Perform the quality control procedures listed below in conjunction with the requirements of this Section.
 - 1. Inspect all materials upon receipt to ensure that all are supplied by the Manufacturer.
 - 2. Provide specified storage conditions for the resurfacing system materials, solvents, and abrasives.
 - 3. Inspect and record findings for the degree of cleanliness of substrates used. The pH of the concrete substrate will be measured using pH indicating papers. pH testing is to be performed once every 50 sq. ft. Acceptable pH values shall be between 8.0 and 11.0 as measured by a full-range (1-12) color indicating pH paper with readable color calibrations and a scale at whole numbers (minimum). Use Hydrion Insta-Check Jumbo 0-13 or 1-12 or equal. The paper shall be touched to the surface once using moderate gloved finger pressure. The surface shall not be wiped or moved laterally to disturb the surface during pH testing. Following the one touch, lift the paper vertically to not "wipe" the surface. Compare the color indicated with the scale provided and record the pH.
 - 4. Inspect and record substrate profile (anchor pattern). Surfaces shall be abraded, as a minimum, equal to the roughness of CSP-5 ICRI Guideline 03732.
 - 5. Measure and record ambient air temperature once every two hours of each shift using a thermometer and measure and record substrate temperature once every two hours using a surface thermometer.
 - 6. Measure and record relative humidity every two hours of each shift using a sling psychrometer in accordance with ASTM E337.
 - 7. Provide correct mixing of resurfacing materials in accordance with the Manufacturer's instructions.

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8. Inspect and record that the "pot life" of resurfacing materials is not exceeded during installation.
 9. Verify curing of the resurfacing materials in accordance with the Manufacturer's instructions.
 10. Upon full cure, the installed lining system shall be checked for discontinuities by high voltage holiday detection in accordance with NACE RP0188-90, and the manufacturer's printed application guide to verify a pinhole-free surface. Areas which do not pass the holiday detection test shall be corrected at no cost to the Owner and rechecked
 11. Upon completion of the lining system installation, the lined area shall be cleaned and prepared to permit close visual inspection by the Engineer or the Engineer's representative. Any and all deficiencies or defective work (not in compliance with this section or related sections) will be marked for repair or removal/replacement by the Contractor at no additional cost to the Owner.
- C. As each coating is completed, Contractor shall, in cooperation with the Owner's Testing Laboratory, perform destructive thickness testing in accordance with the following test procedure at no additional cost:
1. Contractor shall advise the Owner's Testing Laboratory of the readiness for each tank to be tested.
 2. The Owner's Testing Laboratory shall mark and number sample locations at a rate of one test per 2,000 square feet of coated surface.
 3. Contractor shall, utilizing a coring bit, remove the coating from the indicated spot mark the sample with the corresponding sample location number and deliver it to the Owner's Testing Laboratory.
 4. Owner's Testing Laboratory shall measure the sample thickness at representative points around the sample perimeter to determine specification compliance. If a sample is found to be deficient in thickness, then it shall be considered as a failing sample. The entire area between the failing sample and the next adjacent passing samples either side of the failed sample shall be considered to have failed. In that case, Contractor shall recoat all failed areas and additional sampling will be performed at a frequency directed by the Owner's Testing Laboratory.
 5. Recoating and associated surface preparation shall be in accordance with coating manufacturer's recommendations.
 6. At contractor's request prior to recoating of a failed area, additional core samples will be marked by the Owner's Testing Laboratory for testing with the intent to more precisely define the extent of the coatings thickness failure. Such samples shall be no closer than 50% of the distance between the outermost failed test and the adjacent passing test.
 7. The location of test cores shall not be repaired prior to examination of the cores by the Owner's Testing Laboratory. Upon the Owner's Testing

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Laboratory approval, all test core locations shall be patched in accordance with coating manufacturer's recommendations.

8. All areas required to be recoated shall be retested and additional sampling will be performed at a frequency directed by the Owner's Testing Laboratory to include at least two core samples.
9. If more than 30% of the original core samples indicate insufficient coatings thickness, then the entire structure shall be considered to have failed and the entire structure shall be recoated.
10. All testing, coring, repairs and recoating shall be at no additional cost to the Owner.

3.6 FINAL INSPECTION

- A. Perform a final inspection to determine whether the resurfacing system work meets the requirements of the specifications. The Engineer and the Owner's Testing Laboratory representative will conduct final inspection with the Contractor.

3.7 CLEANUP

- A. Upon completion of work, the Contractor shall remove surplus materials, equipment, protective coverings, and accumulated rubbish, and thoroughly clean all surfaces and repair any work-related damage. The surrounding surface areas including roadways and all other surfaces shall be restored to their pre-project condition.

END OF SECTION 09704

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.1 SCOPE

A. Scope Of Work:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.

B. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Engineer will select from standard colors or finishes available.

1. Painting includes field-painting exposed bare and covered pipes and ducts, hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

C. Painting is not required on pre-finished items, finished metal surfaces, concealed surfaces, operating parts, and labels.

1. Pre-finished items not to be painted include the following factory-finished components:
 - a. Finished mechanical and electrical equipment unless noted otherwise.
 - b. Light fixtures.
 - c. Switchgear.
 - d. Distribution cabinets.
 - e. Fire-extinguishers and mounting hardware.

- f. Fiberglass doors and frames.
- 2. Finished metal surfaces not to be painted include:
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plate.
 - d. Copper.
 - e. Bronze.
 - f. Brass.
 - g. Galvalume.
- 3. Operating parts not to be painted include moving parts of operating equipment, such as the following:
 - a. Valve- and damper-operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
- 4. Labels: Do not paint over Underwriters Laboratories', Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
- D. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 5 Section METAL FABRICATIONS for shop-priming ferrous metal.

1.3 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.
 - 1. Product Data for each paint system specified, including block fillers and primers.
 - a. Provide the manufacturer's technical information including label analysis and instructions for handling, storage, and application of each material proposed for use.
 - b. List each material and cross-reference the specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.

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- B. Samples for initial color selection in the form of manufacturer's color charts, if applicable.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.
- B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- C. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface until required sheen, color, and texture are obtained; simulate finished lighting conditions for review of in-place work.
 - 1. Final acceptance of colors will be from job-applied samples.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the Job Site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45°F (7°C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
 - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

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1.6 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50°F (10°C) and 90°F (32°C).
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45°F (7°C) and 95°F (35°C).
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85%; or at temperatures less than 5°F (3°C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include the following:
 - 1. BENJAMIN MOORE AND CO. (MOORE).
 - 2. PPG INDUSTRIES, PITTSBURGH PAINTS (PPG).
 - 3. PRATT AND LAMBERT (P&L).
 - 4. THE SHERWIN-WILLIAMS COMPANY (S-W).
 - 5. ICI DULUX PAINT CENTERS

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish the manufacturer's material data and certificates of performance for proposed substitutions.

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- C. Colors: Provide color selections made by Engineer from the manufacturer's full range of standard colors.

2.3 PRIMERS

- A. Primers: Provide the manufacturer's recommended factory-formulated primers that are compatible with the substrate and finish coats indicated.

- 1. Available Products: Subject to compliance with requirements, prime-coat materials that may be incorporated in the Work include, but are not limited to, the following: Ferrous Metal Primers: Synthetic, quick-drying, rust-inhibiting primers.

- a. MOORE IronClad Retardo Rust-Inhibitive Paint #163
- b. PPG 6-208 Red Inhibitive Metal Primer
- c. P&L Effecto Rust-Inhibiting Primer
- d. S-W Kem Kromik Metal Primer B50N2/B50W1

- 2. Ferrous Metal Primers: Alkyd-type primers.

- a. MOORE IronClad Retardo Rust-Inhibitive Paint #163
- b. PPG 6-612 Speedhide Inhibitive White Primer
- c. P&L Effecto Primer Red or White
- d. S-W: Kem Kromik Metal Primer B50N2/B50W1

- 3. Galvanized Metal Primers:

- a. MOORE IronClad Galvanized Metal Latex Primer #155
- b. PPG 6-215/216 Speedhide Galvanized Steel Primer
- c. P&L P&L Interior Trim Primer
- d. S-W Galvite B50W3

2.4 UNDERCOAT MATERIALS

- 1. Undercoat Materials: Provide the manufacturer's recommended factory-formulated undercoat materials that are compatible with the substrate and finish coats indicated.

2.

- 3. Available Products: Subject to compliance with requirements, undercoat materials that may be incorporated in the Work include, but are not limited to, the following:

- a. Interior Enamel Undercoat: Ready-mixed enamel.
- b. MOORE MOORE's Alkyd Enamel Underbody #217

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- c. PPG 6-6 Speedhide Quick-Dry Enamel Undercoater
- d. P&L Interior Trim Primer
- e. S-W ProMar 200 Alkyd Semi-Gloss Enamel B34W200

2.5 EXTERIOR FINISH PAINT MATERIAL

- A. Finish Paint: Provide the manufacturer's recommended factory-formulated finish-coat materials that are compatible with the substrate and undercoats indicated.
- B. Available Products: Subject to compliance with requirements, finish coat materials that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Concrete Elastomeric Coating System:
 - a. ICI DULUX PAINT CENTERS Decra-Flex Elastomeric Coating System 2270 Fine

2.6 INTERIOR FINISH PAINT MATERIAL

- A. Finish Paint: Provide the manufacturer's recommended factory-formulated finish-coat materials that are compatible with the substrate and undercoats indicated.
- B. Available Products: Subject to compliance with requirements, finish coat materials that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Concrete:
 - a. ICI DULUX PAINT CENTERS Decra-Flex Elastomeric Coating System 2270 Fine

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.

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1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
 2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
1. Notify the Engineer about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and reprime. Notify Engineer in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
 2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen, as required, to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.

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- b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
 - c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 4. Ferrous Metals: Clean non-galvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC).
 - a. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - b. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
 5. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.
 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

3. Use only thinners approved by the paint manufacturer and only within recommended limits.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 1. Paint colors, surface treatments, and finishes are indicated in the Schedules or on the Drawings.
 2. Provide finish coats that are compatible with primers and sealers used.
 3. Spray painting must be scheduled with other trades so as not to be a hazard.
 4. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.
 5. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
 6. The term exposed surfaces includes areas visible when permanent or built-in fixtures, convactor covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
 7. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 8. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
 9. Sand lightly between each succeeding enamel or varnish coat.
 10. Omit primer on metal surfaces that have been shop-primed and touch-up painted.
- C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

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1. Allow sufficient time between successive coats to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
- D. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer's directions.
1. Brushes: Use brushes best suited for the material applied.
 2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
- E. Minimum Coating Thickness: Apply materials no thinner than the manufacturers recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
- F. Mechanical and Electrical Work: Painting mechanical and electrical work is limited to items exposed in mechanical equipment rooms and in occupied spaces.
- G. Mechanical items to be painted include, but are not limited to, the following:
1. Piping, pipe hangers, and supports.
 2. Tanks.
 3. Ductwork.
 4. Supports.
 5. Motors and mechanical equipment.
 6. Accessory items.
- H. Electrical items to be painted include, but are not limited to, the following:
1. Conduit and fittings.
 2. Switchgear.
- I. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- J. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Re-coat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

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- K. Pigmented (Opaque) Finishes: Completely cover to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
- L. Provide satin finish for final coats.
- M. Completed Work: Match approved samples for color, texture, and coverage. Remove, re-finish, or re-paint work not complying with specified requirements.

3.4 CLEANING

- A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the Site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Engineer.
- B. Provide "Wet Paint" signs to protect newly-painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
- C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated.
- B. Ferrous Metal: Primer is not required on shop-primed items.
 - 1. Full-Gloss Alkyd Enamel: Two (2) finish coats over primer.

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- a. Primer: Synthetic rust-inhibiting primer.
 - 1) MOORE IronClad Retardo Rust-Inhibitive Paint #163
 - 2) PPG 6-208 Red Inhibitive Metal Primer
 - 3) P&L Effecto Rust-Inhibiting Primer
 - 4) S-W Kem Kromik Metal Primer B50N2/B50W1.
 - b. First and Second Coats: Gloss alkyd enamel.
 - 1) MOORE Impervo High-Gloss Enamel #133
 - 2) PPG 54 Line Quick-Dry Enamel
 - 3) P&L Effecto Enamel
 - 4) S-W Industrial Enamel B-54 Series
- C. Zinc-Coated Metal:
- 1. High-Gloss Alkyd Enamel: Two (2) finish coats over primer.
 - a. Primer: Galvanized metal primer.
 - 1) MOORE IronClad Galvanized Metal Latex Primer #155
 - 2) PPG 6-215/216 Speedhide Galvanized Steel Primer
 - 3) P&L Interior Trim Primer
 - 4) S-W Galvite B50W3
 - b. First and Second Coats: Gloss alkyd enamel.
 - 1) MOORE Impervo High-Gloss Enamel #133
 - 2) PPG 54 Line Quick-Dry Enamel
 - 3) P&L Effecto Enamel
 - 4) S-W Industrial Enamel B-54 Series.
- D. Concrete:
- 1. Concrete Filler - Two (2) coats minimum:
 - a. ICI DULUX PAINT CENTERS Ultra-Hide Blockaid Interior/Exterior Masonry Filler 3110-1200.
 - 2. Concrete Elastomeric Paint - Apply to film thickness recommended by manufacturer for each substrate type.
 - a. ICI DULUX PAINT CENTERS Decra-Flex Elastomeric Coating System 2270, Fine

3.7 INTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates, as indicated.
- B. Ferrous Metal:
1. Semi-loss Enamel Finish: Two (2) coats over primer with total dry film thickness not less than 2.5 mils.
 - a. Primer: Synthetic, quick-drying, rust-inhibiting primer.
 - 1) MOORE Ironclad Retardo Rust-Inhibitive Paint #163
 - 2) PPG 6-208 Red Inhibitive Metal Primer
 - 3) P&L Effecto Rust-Inhibiting Primer
 - 4) S-W Kem Kromik Metal Primer B50N2/B50W1
 - b. Undercoat: Interior enamel undercoat.
 - 1) MOORE MOORE's Alkyd Enamel Underbody #217
 - 2) PPG 6-6 Speedhide Quick-Dry Enamel Undercoater
 - 3) P&L Interior Trim Primer
 - 4) S-W Pro-Mar 200 Alkyd Enamel Undercoater B49W200
 - c. Finish Coat: Interior, semi-gloss, odorless, alkyd enamel.
 - 1) MOORE MOORE's Satin Impervo Enamel #235
 - 2) PPG 27 Line Wallhide Semi-Gloss Enamel
 - 3) P&L Cellu-Tone Alkyd Satin Enamel
 - 4) S-W Classic 99 Semi-Gloss Enamel A40 Series
 2. Semi-Gloss Finish: Two (2) coats over primer, with total dry film thickness not less than 2.5 mils.
 - a. Primer: Galvanized metal primer.
 - 1) MOORE Ironclad Galvanized Metal Latex Primer #155
 - 2) PPG 6-215/216 Speedhide Galvanized Steel Primer
 - 3) P&L Interior Trim Primer
 - 4) S-W Galvite B50W3
 - b. Undercoat: Interior enamel undercoat.
 - 1) MOORE MOORE's Alkyd Enamel Underbody #217
 - 2) PPG 6-6 Speedhide Quick-Dry Enamel Undercoater
 - 3) P&L Interior Trim Primer
 - 4) S-W Pro-Mar 200 Alkyd Enamel Undercoater B49W200

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- c. Finish Coat: Interior, semi-gloss, odorless, alkyd enamel.
 - 1) MOORE MOORE's Satin Impervo Enamel #235
 - 2) PPG 27 Line Wallhide Semigloss Enamel
 - 3) P&L Cellu-Tone Alkyd Satin Enamel
 - 4) S-W Classic 99 Semi-Gloss Enamel A40 Series

END OF SECTION 09900

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SECTION 11100 - SUBMERSIBLE CENTRIFUGAL PUMPS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Contractor shall furnish and install the submersible non-clog pumps, related piping, supports, and all other necessary appurtenances as shown on the drawings and specified in these specifications.

1.2 SUBMITTALS

- A. Submit shop drawings, technical data, and pump curves in accordance with Section 01300. Submit operation and maintenance data in accordance with Section 01730.

1.3 QUALITY ASSURANCE

- A. All pumps shall be furnished by a single manufacturer. Non-clog Pumps shall be WILO/EMU.

1.4 PUMP WARRANTY

- A. The pump manufacturer shall warrant the units being supplied to the owner against defects in workmanship and material for a period of five (5) years. Warranty period shall begin on the date of project substantial completion.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The Contractor shall furnish and install one (1) submersible non-clog sewage pump (other existing pump shall be reinstalled) for the proposed lift station. Each pump shall be furnished with a stainless steel lifting bail only and without cable or lifting chain and a minimum of 40 to 60 feet of hypalon jacketed type SPC cable, P-MSHA approved and sized according to N.E.C. and ICEA standards.

2.2 REQUIREMENTS

Lift Station # 21

Primary Design Point	165 GPM @ 77' TDH
Minimum Shutoff Head	95 feet
Minimum Efficiency at Primary Design Point	52%

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Maximum Motor Horse Power	7.4 hp
Maximum Motor Speed	1800 rpm
Voltage	230v-3 phase
Minimum Motor Service Factor/Insulation Class	1.15/ Class H
Minimum Pump Solids Passing Capability	3"
Motor Rating	FM Explosion Proof
Minimum Motor Rating/Starts per Hour	15
Minimum Motor Bearing Life Guarantee (at any usable portion of the pump curve)	50,000 hours

Pumps shall be WILO/EMU model FA 10.33E with motor FK17.1-4/12KEx

2.3 PUMP DESIGN

- A. The pumps shall be capable of handling raw, unscreened sewage. The discharge connection elbow shall be permanently installed in the wet well along with the discharge piping. The pumps shall be automatically connected to the discharge connection elbow when lowered into place, and shall be easily removed for inspection or service. There shall be no need for personnel to enter the wetwell to gain access to the pumps. Sealing of the pumping unit to the discharge connection elbow shall be accomplished by a simple linear downward motion of the pump. A sliding guide bracket shall be an integral part of the pump unit. The entire weight of the pumping unit shall be guided by no less than two guide bars and pressed tightly against the discharge connection elbow. No portion of the pump or the guide support system other than the discharge connection shall bear directly on the floor of the sump. The pump, with its appurtenances and cable, shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 ft.

2.4 PUMP CONSTRUCTION

- A. Major pump components shall be of gray cast iron, Class 35B, with smooth surfaces devoid of blow holes and other irregularities. Where watertight sealing is required, o-rings made of nitrile rubber shall be used. All exposed nuts and bolts shall be of AISI type stainless steel 304 construction. All surfaces coming into contact with sewage, other than stainless steel, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump. The impeller shall be coated with an acrylic dispersion zinc phosphate primer.
- B. All mating surfaces where watertight sealing is required shall be machined and fitted with nitrile rubber o-rings. Fitting shall be such that sealing is accomplished by metal-to-metal contact between machine surfaces. This will result in controlled compression of nitrile rubber o-rings without the

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requirement of a specific torque limit. No secondary sealing compounds, rectangular gaskets, elliptical o-rings, grease or other devices shall be used.

2.5 CABLE ENTRY SEAL

- A. The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall be comprised of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the entry body containing a strain relief function, separate from the function of sealing the cable. The assembly shall bear against a shoulder in the pump top. The cable entry junction chamber and motor shall be separated by a terminal board, which shall isolate the motor interior from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.

2.6 MECHANICAL SEAL

- A. Each pump shall be provided with a tandem mechanical rotating shaft seal system. Seals shall run in an oil reservoir. Lapped seal faces must be hydrodynamically lubricated at a constant rate. The lower seal unit, between the pump and oil chamber, shall contain one stationary and one positively driven rotating corrosion resistant tungsten carbide ring. The upper seal unit, between the oil sump and motor housing, shall contain one stationary and one positively driven rotating corrosion resistant tungsten carbide ring. Each interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment but shall be easily inspected and replaceable. The seals shall be capable of operating in either clockwise or counter clockwise direction without damage or loss of seal.
- B. The following seal types shall not be considered acceptable or equal to the dual independent seal specified: shaft seal without positively driven rotating members, or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower units. Cartridge type seal systems shall not be acceptable.
- C. Each pump shall be provided with an oil chamber for the shaft sealing system. The oil chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. The motor shall be able to operate continuously while non-submerged without damage while pumping under load.

2.7 BEARINGS

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- A. The pump shaft shall rotate on at least two permanently lubricated bearings with an L-10 bearing life of 50,000 hours when operating at any usable portion of the pump curve at maximum product speed. The upper motor bearing shall be a single ball type bearing to handle radial loads. The lower bearing shall be a two row angular contact ball bearing to handle the thrust and radial forces. Single row lower bearings shall not be acceptable.

2.8 PUMP SHAFT

- A. Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The pump shaft shall be carbon steel C1035 and completely isolated from the pumped liquid or AISI type 431 stainless steel.

2.9 IMPELLER

- A. The impeller shall be of gray cast iron, Class 35B, dynamically balanced, double-shrouded, non-clogging design having a long thrulet without acute turns. The impeller shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in normal sewage applications. The impeller shall be of a full vane design. The pump manufacturer shall, upon request, furnish mass moment of inertia data for the proposed impeller. The impeller shall be capable of passing a minimum 3 inch solid sphere. The fit between the impeller and the shaft shall be a sliding fit with one key.

2.10 VOLUTE

- A. The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified.
- B. A wear ring shall be installed to provide efficient sealing between the volute and impeller. The wear ring shall be a stationary ring made of nitrile rubber molded with a steel ring insert, which is drive fitted to the volute inlet and rotating stainless steel AISI 304 ring which is drive fitted to the impeller skirt.

2.11 MOTOR DESIGN

- A. The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an oil filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C

(104°F) and capable of up to 15 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator lead coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals. The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.

- B. The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics.
- C. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chloroprene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet.
- D. All pump motors shall be FM approved (Explosion Proof) rated for use in Class 1, Groups C & D, Division 1 hazardous locations.
- E. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

2.12 COOLING SYSTEM

- A. Each pump/motor unit shall be provided with an integral, self-supplying or self-contained cooling system. The motor water jacket shall encircle the stator housing and shall be of cast iron, ASTM A-48, Class 35B. The water jacket shall thus provide heat dissipation for the motor regardless of whether the motor unit is submerged in the pumped media or surrounded by air. After passing through a classifying labyrinth, the impeller back vanes shall provide the necessary circulation of the cooling liquid through the cooling system. Two cooling liquid supply pipes, one discharge low and one discharge high within the jacket, shall supply the cooling liquid to the jacket. An air evacuation tube shall be provided to facilitate air removal from within the jacket. Any piping internal to the cooling system shall be shielded from the cooling media flow allowing for unobstructed circular flow within the jacket

about the stator housing. Two cooling liquid return ports shall be provided. The internals of the cooling system shall be non-clogging by virtue of their dimensions. Drilled and threaded provisions for external cooling and seal flushing or air relief are to be provided. The cooling system shall provide for continuous submerged or completely non-submerged pump operation in liquid or in air having a temperature of up to 40°C (104°F), in accordance with NEMA standards. Restrictions limiting the ambient or liquid temperatures at levels less than 40°C are not acceptable.

2.13 PROTECTION

- A. All stators shall incorporate thermal switches in series to monitor the temperature of each phase of the winding. Should high temperature occur, the thermal switches shall open, stop the motor, and activate an alarm.
- B. A leakage sensor shall be provided to detect water in the stator chamber or pump seal chamber. The Float Leakage Sensor (FLS), a small float switch, shall be used to detect the presence of water in the stator chamber. When activated, the FLS will stop the motor and activate an alarm.

2.14 ALUMINUM ACCESS DOORS

- A. WET WELL ACCESS DOORS
 1. The wet well access hatches shall be Flygt, US Foundry, or engineer approved equal.
 2. The safety grate shall be made of 6061-T6 aluminum with a minimum ultimate strength of 38,000 p.s.i. and a minimum yield strength of 35,000 p.s.i., as per A.S.T.M. B221.
 3. Grating shall be designed to withstand a minimum live load of 300 pounds per square foot. Deflection shall not exceed 1/150th of the span.
 4. Grate opening shall be 5" x 5", which will allow for visual inspection, limited maintenance and float adjustments while the safety grate fall through protection is left in place.
 5. Design must assure that fall through protection is in place before the doors can be closed, thereby protecting the next operator.
 6. Each grate shall be provided with a permanent hinging system, which will lock the grate in the 90-degree position once opened.
 7. The opening arm shall be equipped with a controlled confined space entry lock (lock provided by others).
 8. Grate shall be coated with an OSHA type safety orange color, promoting visual awareness of the hazard. The aluminum safety grates shall receive a two-coat powder coat system, applied by the electrostatic spray process. The base coat is a thermosetting epoxy powder coat finish with a minimum thickness of 2-4 mils. The top coat is a mar-resistant, TGIC polyester powder coating with a minimum

thickness of 2-4 mils. Each coat shall be baked at 350-375 degrees F until cured.

9. Welding shall be in accordance with ANSI/AWS D1.2-90 Structural Welding Code for Aluminum.

B. Valve Box Access Doors

Door leaf shall be minimum ¼" aluminum pattern plate reinforced to withstand a live load of 300 pounds per square foot. Frame shall be ¼" aluminum with an anchor flange around the perimeter. Doors shall be equipped with heavy forged brass or stainless steel hinges, stainless steel pins, and an automatic hold-open arm with release handle. Provide a staple for padlock and an aluminum lifting handle. The lifting handle shall recess into the door when not in use. Hardware shall be cadmium plated and factory finish. The frame shall be mill finish with bituminous coating applied to exterior channels where they come in contact with the frame. Doors shall be hinged as shown in the plans. Where opposite opening doors are indicated, safety chains shall be provided. Door assemblies shall meet OSHA Requirements.

2.15 PRECAST REINFORCED CONCRETE WETWELL AND VALVE BOX

- A. Precast reinforced concrete wetwell shall conform to ASTM Specification C-478 Wall "C". Precast reinforced valve box shall conform to ASTM C-890. All joints for precast sections shall be tongue and groove and shall be approved by the Engineer. All pipe connections to precast wetwells shall utilize a Kor-N-Seal type connection or approved equal for a watertight fit.
- B. All concrete for precast wetwells and valve boxes shall be special corrosion resistant concrete utilizing Type II Portland Cement (ASTM Standard) and Class F fly ash. The latest version of ASTM C 618 classification must be followed for chemical requirements, physical properties (e.g., fineness, soundness, etc.), and for all other technical and non-technical specifications. Verification of fly ash characteristics must be done according to the latest edition of ASTM C311. Contractor shall make sure that the supplier of the fly ash should have a quality control program in conformance with ASTM C 618 that is technically and statistically sound. The concrete shall have a minimum 28-day compressive strength of 4,000 psi. Concrete shall have a minimum of 560 lbs. cement per cubic yard and shall have a maximum water/cement ratio of 0.35. Air entrainment admixture shall be used to make concrete workable.
- C. The Contractor shall provide certification to the Engineer indicating that all precast manhole sections meet the Corrosion Resistant Cement requirements.

PANAMA CITY BEACH – LIFT STATION #21 IMPROVEMENTS

2.16 WETWELL COATING

- A. With exception to where the elastomeric waterproof wrapping is applied around the exterior wetwell joints, all concrete surfaces shall be coated with coal tar epoxy with a minimum thickness of 20 mils for protection against groundwater.

2.17 PRESSURE TEST VALVE AND GAUGE

- A. Pressure test valve shall be a brass curb stop of the oroseal or Teflon coated ball-type with a brass saddle and fitting for pressure gauge connection. Pressure gauge shall be 0-60 psi range, 4½" liquid-filled gauge with stainless steel dial and bourdon tube and ½" NPT stainless steel connection stem and isolation diaphragm seal filled with glycerin and housed in stainless steel. Gauge to be Ametek Model 1931L or equal.

PART 3 - EXECUTION

3.1 PUMP STATION (GENERAL)

- A. Access door units shall be flush with concrete surface and in alignment to permit unobstructed removal of pumps and valves. Complete the pump station piping and fittings in accordance with the plans and specifications relating thereto. Remove all lifting eyes etc. from precast units, rub all joints, coat interior of pump station wetwell with coal tar epoxy coating, apply Rub-Nek elastomeric external joint wrap or equal (9" minimum width) to all external joints as recommended by the product manufacturer, coat exterior of wetwell with coal-tar epoxy, clean hatches to bare metal, touch up paint on electric panels, clean wet well, valve pit, drains, and grade site.

3.2 INSTALLATION OF EQUIPMENT

- A. The Contractor shall install equipment as required by the manufacturer's written installation instructions and approved shop drawings unless otherwise directed by the Engineer.
- B. Pump piping shall be completely made up and secured to prevent any excess movement. Provide permanent supports, and wedges as indicated to restrain movement.
- C. Excess motor and control wire shall be carefully coiled and hung inside the wet well. These wires shall not be cut and all identification tags shall be in place. Cables shall be supported with S.S. basket weave type strain reliefs hung in wet well and be routed in a manner that will not interfere with access to any equipment or terminals in the control panels.

3.2 SPARE PARTS

- A. The following spare parts shall be supplied by the contractor for each of the pump stations:
- (1) Set of upper and lower shaft seals
 - (1) Set of upper and lower bearings
 - (1) O-ring kit
 - (1) Volute wear ring
 - (1) Impeller wear ring
 - (1) Oil inspection port o-ring

3.3 PUMP TEST

- A. The pump manufacturer shall perform the following inspections and tests on each pump before shipment from factory:
- 1. Impeller, motor rating and electrical connections shall first be checked for compliance to the customer's purchase order.
 - 2. A motor and cable insulation test for moisture content or insulation defects shall be made.
 - 3. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.
 - 4. The pump shall be run for 30 minutes submerged under a minimum of six (6) feet under water.
 - 5. After operational test No. 4, the insulation test (No. 2) is to be performed again.
- B. A written report stating the foregoing steps have been done shall be supplied with each pump at the time of shipment upon request.
- C. The pump cable end will be sealed with a high quality protective covering, to make it impervious to moisture or water seepage prior to electrical installation.

END OF SECTION 11100

PANAMA CITY BEACH – LIFT STATION 21 IMPROVEMENTS

APPENDIX A – MINIMUM TECHNICAL STANDARDS CHECKLIST FOR UTILITY AS-BUILTS

MINIMUM TECHNICAL STANDARDS CHECKLIST FOR UTILITY AS-BUILTS

CITY OF PANAMA CITY BEACH
DATED MAY, 2012

SURVEYORS AND MAPPERS MUST MEET THE FOLLOWING MINIMUM STANDARDS OF ACCURACY, COMPLETENESS, AND QUALITY FOR THE CITY OF PANAMA CITY BEACH TO ACCEPT AS-BUILTS:

1. MUST IDENTIFY THE RESPONSIBLE SURVEYOR AND MAPPER.
2. SHALL STATE THE TYPE OF SURVEY IT DEPICTS AND THE PURPOSE OF THE SURVEY.
3. MUST BEAR THE NAME, CERTIFICATE OF AUTHORIZATION NUMBER, AND STREET AND MAILING ADDRESS OF THE BUSINESS ENTITY ISSUING THE AS-BUILT SURVEY, ALONG WITH THE NAME AND LICENSE NUMBER OF THE SURVEYOR IN RESPONSIBLE CHARGE.
4. MUST REFLECT A SURVEY DATE, WHICH IS THE DATE OF ACQUISITION. WHEN THE GRAPHICS OF THE AS-BUILT SURVEY ARE REVISED, BUT THE SURVEY DATE STAYS THE SAME, THE AS-BUILT SURVEY MUST LIST DATES FOR ALL REVISIONS.
5. MUST BE SIGNED AND SEALED BY THE SURVEYOR IN RESPONSIBLE CHARGE.
6. A DESIGNATED "NORTH ARROW" AND EITHER A STATED SCALE OR GRAPHIC SCALE SHALL BE SHOWN.
7. APPROPRIATE LINE TYPES, LINE WEIGHTS, AND LINE WIDTHS SHALL BE USED ON THE AS-BUILT DRAWING TO DIFFERENTIATE EXISTING FROM PROPOSED AND WATER FROM SEWER, RECLAIM, AND STORM. ALL PHYSICAL ITEMS (I.E. PIPES, VALVES, ETC.), SURVEYED BOUNDARIES, AND EASEMENTS SHOULD BE CLEARLY MARKED, AND DIMENSIONED, AND IDENTIFIED BY SIZE AND MATERIAL.
8. ALL UTILITIES IN THE PUBLIC RIGHT OF WAY AND WITHIN EASEMENTS OR TO THE END OF THE PUBLICLY OWNED PORTION OF THE UTILITY (I.E. METER AND BACKFLOW PREVENTER, CLEANOUT, ETC.) SHALL BE SHOWN WITH ASSOCIATED SIZES LABELED. THIS INCLUDES, BUT IS NOT LIMITED TO, STUB-OUTS/LATERALS, METERS, BFP'S, WATER MAINS, FORCE MAINS, GRAVITY SEWER MAINS, MANHOLES, STORM WATER PIPING AND ASSOCIATED STRUCTURES, VALVES, FIRE HYDRANTS, LIFT STATIONS, ETC. ALL PIPE LINE WORK MUST BE CONNECTED WITHIN THE SITE AS WELL AS THE CONNECTION TO EXISTING UTILITIES ADJACENT TO THE SITE (IT IS THE SURVEYOR'S RESPONSIBILITY TO COORDINATE WITH ALL CONTRACTORS FOR LOCATIONS AND SIZING). ALL UTILITY CONNECTIONS TO THE BUILDINGS MUST BE SHOWN.
9. ALL PROPOSED UTILITY/INGRESS/EGRESS EASEMENTS MUST BE SHOWN ON THE DRAWING AND MUST HAVE THE ASSOCIATED LEGAL DESCRIPTION WRITTEN.
10. EDGE OF PAVEMENT, ROADS (ASPHALT SHADED), CURBS, DRIVEWAY CONNECTIONS, BUILDINGS, PARKING LOTS, RIGHT-OF-WAY, AND STREET NAMES MUST BE SHOWN IN ALL APPLICATIONS. ALL ITEMS MENTIONED ABOVE MUST BE FIELD LOCATED.
11. IF A LIFT STATION IS TO BE DEDICATED TO THE CITY THE PLAN MUST SHOW A DETAIL SCALED AT 1"=10' SHOWING ALL IMPROVEMENTS INCLUDING: WATER AND SEWER SERVICES, MANHOLES, INVERTS, RIMS, BFP'S, YARD HYDRANTS, CONTROL PANELS, FENCING, PARCEL BOUNDARY, LEGAL DESCRIPTION OF PARCEL BOUNDARY, WET WELL, VALVE BOX, FORCE MAIN, FLOW METER (IF APPLICABLE), DRIVEWAY, GATE.
12. PROPERTY BOUNDARY MUST BE CLEARLY LABELED AND DIMENSIONED.
13. INVERTS, GRATES, TOPS, RIMS MUST BE SHOWN FOR ALL STORM WATER DRAINAGE STRUCTURES. INVERTS (PIPES AND CLEANOUTS) AND RIMS MUST BE SHOWN FOR ALL GRAVITY SEWER MANHOLES. SLOPES MUST BE SHOWN ON EACH RUN OF PIPE FOR REVIEW AND APPROVAL.
14. "AS-BUILT" PROFILE OF ALL DIRECTIONAL BORES AND JACK-AND-BORES INDICATING GRADE AND PIPE ELEVATIONS AT 10 FOOT INTERVALS SHALL BE PROVIDED ON AS-BUILT PLAN SHEETS BASED ON BORE LOGS DEVELOPED BY BORING CONTRACTOR DURING INSTALLATION. PROFILES SHALL USE HORIZONTAL STATIONING WHICH TIES TO STATIONING ON PLANS. PROFILES SHALL ALSO SHOW EXISTING SURFACE ELEVATIONS AS WELL AS ANY PROPOSED SURFACE ELEVATIONS ON THE PROFILE. SURFACE PROFILES MUST SHOW ANY PAVEMENT, SIDEWALKS, DITCHES, SWALES ETC. NOTE THAT PROFILES LOCATING PIPE SOLELY BY "DEPTH BELOW EXISTING GROUND" WILL NOT BE ACCEPTED.
15. COASTAL SETBACK LINE OR COASTAL CONSTRUCTION CONTROL LINE SHOULD BE DESIGNATED.
16. ELEVATIONS AND LOCATION OF ANY FLOOD ZONES ALONG THE FLOOD HAZARD BOUNDARIES SHALL BE DELINEATED.
17. NEARBY WETLANDS AND OTHER ENVIRONMENTALLY SIGNIFICANT RESOURCES CLEARLY LABELED.
18. STORM WATER MANAGEMENT SYSTEM FEATURES INCLUDING DIMENSIONS OF : WET AND DRY SWALES, WET AND DRY PONDS, CONVEYANCE SYSTEMS, EASEMENTS, ALONG WITH ALL ASSOCIATED M.E.S. STRUCTURES AND INVERTS, OUTFALL STRUCTURES AND INVERTS, SKIMMERS, DISCHARGE STRUCTURES AND INVERTS AND SLOT ELEVATIONS, TOP OF BANK, SLOPE OF BANK AND BOTTOM OF ALL PONDS, SWALES, CLOSED AND OPEN CONVEYANCES. FOR FEMA LOMR SUBMITTALS ALSO PROVIDE: FINISHED FLOOR ELEVATIONS, SPOT ELEVATIONS AND/OR CONTOURS SHOWING LOWEST LOT ELEVATIONS.
19. THE ENGINEER OF RECORD SHALL REVIEW AND APPROVE THE AS-BUILT PRIOR TO SUBMISSION TO THE CITY FOR FINAL APPROVAL. WRITTEN APPROVAL BY THE ENGINEER OF RECORD SHALL BE NOTED ON A TRANSMITTAL WITH A STATEMENT OF NO EXCEPTIONS TO MINIMUM STANDARDS PROVIDED HEREIN.

STORM WATER REQUIREMENTS FOR THE AS-BUILT SURVEYS ONLY APPLY TO PARCELS WITHIN CITY LIMITS.
PLEASE SUBMIT THREE (3) HARD COPIES AND ONE (1) DIGITAL (AUTOCAD FORMAT) FOR REVIEW AND APPROVAL .

CITY OF P.C.B. UTILITIES DEPARTMENT		MINIMUM TECHNICAL STANDARDS FOR AS-BUILTS	M-29
REV.	DATE		
	 _____ DATE OF APPROVAL	

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