



**Project Manual - Conformed Submittal
Town of Longboat Key**

**Potable Water System Subaqueous Crossing of
Longboat Pass and System Pressure Controls
BID Submittal February 2014**

Conformed June 2014



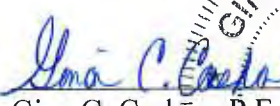
PROJECT MANUAL – CONFORMED SUBMITTAL
FOR THE TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS CROSSING OF LONGBOAT PASS
AND SYSTEM PRESSURE CONTROLS
JUNE 2014

The following Technical Specifications for the Town of Longboat Key, Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls project dated February 2014 (BID SUBMITTAL) were prepared under my direction and supervision.

DIVISION 01 – GENERAL REQUIREMENTS

01001	General Requirements
01002	Information Available to Bidders
01010	Summary of Work
01014	Construction Constraints
01045	Cutting and Patching
01050	Field Engineering
01065	Permits and Fees
01095	References
01100	Special Project Procedures
01150	Measurement and Payment
01152	Application for Payment
01153	Change Order Procedures
01170	Additional Project Provisions
01200	Project Meetings
01300	Submittals
01310	Construction Schedules (Bar Chart)
01370	Schedule of Values
01380	Audio Video Taping
01390	Construction Photographs
01400	Contractor Quality Control
01410	Testing and Independent Testing Laboratory Services
01445	Pipeline Testing and Cleaning
01500	Temporary Utilities
01505	Mobilization and Demobilization
01570	Traffic Regulation
01580	Project Identification and Signs


Gina C. Cashon, P.E.
Florida Professional Engineer No. 43891
CDM Smith Inc.
1715 N Westshore Blvd
Tampa, Florida 33607
Telephone: (813) 281-2900
FL COA No. EB-0000020

 6/9/14
Date

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01590	Field Offices
01600	Delivery, Storage and Handling
01610	Material and Equipment
01665	Startup
01700	Contract Closeout
01710	Cleaning
01720	Project Record Documents
01730	Operating and Maintenance Data
01740	Warranties and Bonds

DIVISION 02 - SITEWORK

02050	Removal, Modification, and Abandonment of Pipelines
02100	Site Preparation
02140	Dewatering and Drainage
02213	Rock and Boulder Excavation
02220	Structural Excavation, Backfill & Compaction
02221	Excavation, Bedding, and Backfill for Pipe
02223	Excavation Below Normal Grade and Bedding Rock Refill
02270	Sedimentation and Erosion Control
02311	Excavation Support and Protection
02413	Horizontal Directional Drilling
02575	Pavement Repair and Restoration
02616	Ductile Iron Pipe and Fittings
02622	Polyvinyl Chloride (PVC) Pipe
02623	High Density Polyethylene Pipe and Fittings


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Florida Professional Engineer No. 43891

4/9/14
Date

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02932 Sodding
02999 Miscellaneous Work and Cleanup

DIVISION 09 - FINISHES

09901 Surface Preparation and Shop Prime Painting
09902 Finish Painting

DIVISION 11 – EQUIPMENT

11303 Submersible Sump Pumps

DIVISION 15 - MECHANICAL

15062 Ductile Iron Pipe and Fittings
15100 Valves and Appurtenances



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DIVISION 3- CONCRETE

03100 CONCRETE FORMWORK
03300 CONCRETE AND REINFORCING STEEL
03600 GROUT

DIVISION 5- METAL

05500 MISCELLANEOUS METAL



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PROJECT MANUAL – BID SUBMITTAL
FOR THE TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS CROSSING OF LONGBOAT PASS
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June 2014

The following Technical Specifications for the Town of Longboat Key, Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls project dated February 2014 was prepared under my direction and supervision.

Section 13300	Instrumentation and Controls
Section 13306	Applications Engineering Services
Section 13310	Control System & Radio Telemetry Equipment
Section 13340	Instruments



6/5/14

Michael J. Graham, P.E.
Florida Professional Engineer No. 71194

Date

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DIVISION 16 – ELECTRICAL

16050 General Requirements



Spencer J. Perry Jr., P.E.
Florida Professional Engineer No. 62587

Date

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Telephone: (813) 281-2900
FL COA No. EB-0000020

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DIVISION 01 – GENERAL REQUIREMENTS

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01045	Cutting and Patching
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01665	Startup
01700	Contract Closeout
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01730	Operating and Maintenance Data
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02140	Dewatering and Drainage
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02622	Polyvinyl Chloride (PVC) Pipe
02623	High Density Polyethylene Pipe and Fittings
02932	Sodding
02999	Miscellaneous Work and Cleanup

DIVISION 03 – CONCRETE

03100	Concrete Framework
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09902	Finish Painting

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13340	Instrumentation and Controls – Instruments

DIVISION 14 – CONVEYING SYSTEM (NOT USED)

DIVISION 15 - MECHANICAL

15062	Ductile Iron Pipe and Fittings
15100	Valves and Appurtenances

DIVISION 16 – ELECTRICAL

16050	Electrical

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SECTION 00010

INVITATION TO BID

Bid # 14-002

The Town of Longboat Key (hereinafter "Town" or "Owner") is accepting sealed bids from contractors that shall have recent and successful experience in construction and modifications of pipelines and horizontal directional drilling (government experience preferred) in the State of Florida. Recent shall mean no earlier than 2009. Successfully completed shall be projects performed by the Contractor through final completion. Provide experience information in Section 00400 - Qualified Work Experiences & References. All bidders must be or have a qualifying agent who is a currently licensed Certified General Contractor or Underground Utility Contractor doing business as the bidder submitting the bid. Failure to list or to provide a current licensed Certified General Contractor or Underground Utility contractor, whose license includes doing business as the bidder at the bid acceptance date, shall be deemed a non-responsive bid. All bidders will complete and submit each of the Bid Submittal Forms attached in the bid submittal packet.

The Town has pre-qualified contractors for the horizontal directional drilling portions of this project. Prequalified contractors for the horizontal directional drilling include the following:

1. Gator Boring and Trenching (1800 Blackbird Lane, Pensacola, FL 32534)
2. Mears Group Inc. (2800 Post Oak Blvd., Suite 3010, Houston, TX 77056)
3. TB Landmark Construction (11220 New Berlin Road, Jacksonville, FL 32226)

Only those contractors that have been pre-qualified by the Owner for horizontal directional drilling may be used by the Bidder for the horizontal directional drilling installation of the subaqueous water main on this project.

Sealed bids will be accepted at the Finance Department at Town Hall until 3:00 p.m. eastern standard time (EST) on Thursday, March 27, 2014 for the Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls contract, at which time the public opening of the bids will be held. Bids will not be accepted after 3:00 p.m. on that date. Bid documents are available online at DemandStar or through the Town of Longboat Key Finance Department at 501 Bay Isles Road, Longboat Key, FL 34228. There will be a \$100 nonrefundable charge for Bid Documents. Checks for payment are payable to the Town of Longboat Key. VISA and Master Cards are an acceptable form of payment. The \$100 charge is required before the Bid Documents can be obtained by or mailed to the bidder. There will be a mandatory Pre-Bid conference on Thursday, March 6, 2014 at 10:00 a.m. (EST) at the Town Hall, 501 Bay Isles Road, Longboat Key, FL 34228 for providing pre-bid information and a site visit. For information about the bidding process, contact Traci Moore, Financial Specialist at 941-316-1943. Questions or information requests regarding this Bid must be submitted in writing at least 7 calendar days prior to the bid opening. E-Mail questions or information requests to Traci Moore, Financial Specialist, e-mail address tmoore@longboatkey.org.

Scope of work shall include, but not limited to:

1. Construction of potable water transmission mains including sections constructed by open –trench method and a section constructed by horizontal directional drilling method.
2. Construction of electrical and instrumentation for an existing pressure reducing valve.
3. Perform all associated miscellaneous work, restoration and cleanup.
4. Additive Alternate No. 1 includes construction of a meter vault with all associated electrical and instrumentation components.

The time frame required for this Project is One Hundred Eighty (180) Days from the Start Date as identified in the Notice to Proceed, to Substantial Completion and Two Hundred Ten (210) Days from Start to Final Completion. Liquidated damages will apply if the substantial completion date is not met.

A bid bond for 5% of the amount bid shall be required by all bidders. A public construction bond (performance and payment bond) shall be required by the successful bidder in the amount of 100% of the Contract Sum.

Bidders shall submit three (3) complete sets of fully completed Bid Submittal Forms, Required Submissions at the time of bidding. All Bid Submittals shall have one (1) original and two (2) copies. The original Bid Submittal Forms, Required Submissions shall be marked "Original" and the copies shall be marked "Copy".

Bids received after the scheduled time for opening will not be considered, but can be claimed by the bidder within 10 Days of the opening. After that time, they will be destroyed.

END OF SECTION

SECTION 00100

INSTRUCTIONS TO BIDDERS

THERE WILL BE A MANDATORY PRE-BID MEETING ON THURSDAY, MARCH 6, 2014 AT 10:00 AM (EST) AT THE TOWN OF LONGBOAT KEY TOWN HALL, 501 BAY ISLES ROAD, LONGBOAT KEY, FL 34228 FOR BID INFORMATION AND A SITE VISIT. BID DOCUMENT SUBMITTALS MUST BE DELIVERED TO THE FINANCE DEPARTMENT PRIOR TO THURSDAY, MARCH 27, 2014 AT 3 PM (EST). THERE WILL BE NO EXCEPTIONS.

BIDDER - To ensure consideration of your bid, follow these instructions.

1. EXECUTION OF BID: Bids must contain an original signature of an authorized representative in the space provided on the signature page. Bids must be typed or printed in black ink. Erasable ink is not permitted. All corrections made by a bidder to their bid must be initialed.

2. BID OPENING: All bid openings shall be public on the date specified in the Invitation To Bid. It is the responsibility of the bidder to assure that their bid is delivered at the proper time and place prior to the bid opening. Bids which for any reason are not so delivered will not be considered. **BID SUBMITTAL FORMS USING FACSIMILE OR TELEGRAM ARE NOT ACCEPTABLE.**

NOTE: Bidders may view bid results on the Internet through <http://www.longboatkey.org> by selecting Town Government/Departments/Purchasing/Current Bid Opportunities. Written bid results may also be obtained at Town Hall but will not be given over the telephone. For a copy of the recap, send a written request with a self-addressed, stamped envelope with the bid number on the lower left hand corner of the envelope. Bid files may be examined after bid opening during normal working hours by appointment.

3. PRICES: Firm prices shall be bid.

4. MISTAKES: Bidders are required to examine the Technical Specifications, plans, delivery schedule, bid prices and all other Contract Documents. Failure to do so will be at bidder's risk. In case of a mistake in extension, the unit price will govern. All corrections made by bidder to any bid entry must be initialed and must be submitted before the bid opening.

5. ADDITIONAL TERMS & CONDITIONS: The Town reserves the right to reject bids containing any additional or differing terms or conditions than those stated in the Invitation to Bid, Instructions to Bidders (including the General Conditions and proposed Contract), Technical Specifications, plans, and other Contract Documents.

6. CONFLICT OF INTEREST: The award of any contract as a result of any bid is subject to the provisions of Chapter 112, Florida Statutes. All bidders must disclose, with their bid, the name of any officer, manager, director, or agent who is also an employee of the Town or any of their agencies. Furthermore, all bidders must disclose the name of any Town employee who owns, directly or indirectly, any interest of any amount in the bidder's firms or any of their branches.

7. AWARD(S): The award of a contract based upon any bid shall be based on low bid meeting the terms of the Invitation to Bid, Instructions To Bidders, Technical Specifications, plans and all other Contract Documents relative to the Project unless otherwise indicated. As the best interest of the Town may require, the right is reserved: to make award(s) by total amount of bid, with or without alternate bid prices; to reject all bids, or; waive any minor irregularities or technicalities in bids received

all at the sole discretion of the Town as consistent Chapter 38 of the Town Purchasing Code and any other applicable law whether or not reasonable. Upon award of the bid, a contract shall be entered into between the Town and the successful bidder in the form of the Contract for Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls (hereinafter "Contract") attached to the Bid Submittal Forms, which Contract shall incorporate by reference the General Conditions contained in this Instruction to Bidders.

8. NONCONFORMANCE WITH BID CONDITIONS: Bids and related materials delivered and received not conforming to the Invitation to Bid, Instruction to Bidders, Technical Specifications, plans and all other Contract Documents for the Project will not be accepted for consideration.

9. ADDENDUM: Any changes in the bid shall be made in the form of a written Addendum by the Financial Specialist or her/his representative. No other person shall be authorized to make changes verbally or in writing. If an Addendum is issued, the Addendum sheet must be signed and submitted with the bid submittal sheets at the time and due date of the bid.

10. ASSIGNMENT: Any Contract entered into pursuant to the Invitation to Bid, and any monies which may become due as a result thereof, are not assignable, except with the prior written approval of the Financial Specialist.

11. PATENTS AND ROYALTIES: The bidder, without exception, shall and does hereby indemnify and save harmless the Town and its employees from liability of any nature or kind, including cost and expenses for, or on account of, any copyrighted, patented or non-patented invention, process or article manufactured or used in the completion and submission of bids and/or the performance of the contract, including its use by the Town all as more specifically stated in the General Conditions. If the bidder uses any design, device or material covered by letters, patent or copyright, it is mutually agreed and understood without exception that the bid prices shall include all royalties or cost arising from the use of such design, device or material in any way involved in the Work.

12. FACILITIES: The Town reserves the right to inspect the bidder's facilities at any time, with prior notice.

13. BID PROTEST: Protest periods will be in effect five working days from the date of posting on the Town bulletin board and on Demandstar.com in accordance with the Town's Purchasing Policies and Procedures. "ANY ACTUAL OR PROSPECTIVE BIDDER OR PERSON WHO IS ALLEGEDLY AGGRIEVED IN THE CONNECTION WITH THE SOLICITATION, SUSPENSION, DEBARMENT OR PENDING AWARD OF A CONTRACT MAY PROTEST TO THE FINANCIAL SPECIALIST. FAILURE TO FOLLOW THE VENDOR COMPLAINTS AND DISPUTES PROTEST PROCEDURE WITHIN THE TIME FRAMES PRESCRIBED HEREIN AS ESTABLISHED BY THE TOWN SHALL CONSTITUTE A WAIVER OF YOUR PROTEST AND ANY RESULTING CLAIMS." VENDOR COMPLAINTS PROTEST PROCEDURE MAY BE OBTAINED FROM THE FINANCE DEPARTMENT VIA PHONE, E-MAIL, OR FAX AS SPECIFIED IN SECTION 00010, INVITATION TO BID.

14. REQUEST FOR ADDITIONAL INFORMATION: The Town reserves the right to request additional information from the bidders as reasonably required. This can include items such as requesting interviews, requiring presentations, financial resource information, insurance information, etc. Town will not be liable for any costs incurred by the bidders in connection with such requests

15. CANCELLATION: The Town reserves the right to cancel the Project after the bid opening after reasonable written notice to the successful bidder should it be determined for any reason that completion of the Project is not in the best interest of the Town. Should the service rendered for any bid cause or

threaten endangerment to public safety or welfare, the bid may be canceled by the Finance Department immediately. In addition, in the event of the delay in issuance or refusal by any permitting authority to issue any permits for which the Town has applied prior to the publication of the Invitation to Bid, the Town may, at its sole option and discretion decline to award any Contract for this Project.

16. PUBLIC ENTITY CRIME FORM: A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public Work, may not 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, 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 thirty-six (36) months from the date of being placed on the convicted vendor list.

17. PREFERENCE FOR DRUG FREE WORKPLACE: Whenever two or more bids, which are equal with respect to price, quality and service, are received, preference shall be given to a bid received from a business that certifies that it has implemented a drug free Workplace program in accordance with Section 287.087, Florida Statutes. In order to receive preference, a signed certification of compliance must be submitted with the bid response.

18. BID BOND: A form for the required Bid Bond equal to 5% of the Total Base Bid is included in the Forms and must be completed and submitted with each bid. If the bid is accepted and the bidder shall fail to contract as aforesaid, or fail to provide the required Performance and Payment Bond, or shall fail to provide all insurance as required by the Contract Documents within 15 Days after the posted date of the Notice of Bid Action, the Town, at its option, may determine that the bidder has abandoned his contract and thereupon this bid and the acceptance thereof shall be null and void, and the forfeiture of such security accompanying this bid shall operate and the same shall be the property of the Town.

19. PERFORMANCE AND PAYMENT BOND: A form for the required Performance and Payment Bond is included in the Forms and must be completed and submitted by the successful bidder in accordance with the requirements of the Contract Documents in the amount of 100% of the Contract Sum within 15 Days from posted date of Notice of Bid Action.

END OF SECTION

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Bidder SPECTRUM UNDERGROUND, INC.

ORIGINAL

SECTION 00300
SUBMITTED BID AND ADDENDA ACKNOWLEDGEMENT
(MUST BE COMPLETED AND SUBMITTED WITH BID)

TOWN OF LONGBOAT KEY FLORIDA
SUBMITTED BID # 14-002

The undersigned Bidder declares that the only person or parties interested in this bid as principals are those named herein, that this bid is made without any understanding, contract, or connection with any other person, firm, or corporation providing a bid for the same purpose and that this bid is in all respects fair and without collusion or fraud. The bidder understands that this bid must be manually signed in ink, otherwise it will be considered unresponsive and subject to rejection.

The undersigned bidder represents that the bidder accepts, and that this bid complies with, the Bid Documents; that bidder has carefully examined the proposed forms of Contract and Bonds, the Technical Specifications, Contract Drawings for the designated Work, and all other Bid Documents and Contract Documents. Bidder affirms that bidder has carefully examined the location of the designated Work and that, from his own investigations has satisfied himself as to the nature and location of the Work, the character, quality, and the quantity of materials and the kind and extent of equipment and other facilities needed for the performance of the Work, the general and local conditions and all difficulties to be encountered, and all other items which may, in any way, affect the Work or its performance.

The undersigned bidder proposes, and agrees if this bid is accepted, that he will contract with the Town in the form of the copy of the Contract for Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls included in these Bid Documents, to provide all necessary machinery, tools, apparatus, and other means of construction necessary to do all the Work, and furnish all the materials and equipment specified or referred to in the Contract Documents and Bid Documents in the manner and time herein prescribed, and according to the requirements of the Town as therein set forth.

Under provisions of Chapter 112, Florida Statutes, bidder must disclose with proposal the name of any officer, director, or agent who is also an employee of the Town of Longboat Key. Bidder must disclose on an attachment (provided by bidder) entitled "Submitted Bid Conflict of Interest" the name of any Town of Longboat Key employee who owns, directly or indirectly, a 5% or more interest in the bidder's firm or any of its branches, or in the firm of any Subcontractor to this bid. Absence of such an attachment represents bidder's certification of no such employee.

Bidder acknowledges receipt of the following addenda issued during the bidding period; the cost of which, if any, is included in the Total Contract Price. If an Addendum is issued, the Addendum acknowledgement sheet must be signed and submitted with the bid submittal package at the time and due date of the bid

ADDENDUM #	ADDENDUM DATE
<u>1</u>	<u>2/27/14</u>
<u>2</u>	<u>3/04/14</u>
<u>3</u>	<u>3/21/14</u>

The undersigned bidder understands that the Town reserves the right to reject any or all bids and to waive any informalities and minor irregularities in the bidding. The bidder agrees that this bid shall be good and may not be withdrawn for a period of 120 Days after the scheduled bid opening.

Provide the name of the pre-qualified Horizontal Directional Drilling Subcontractor who will be utilized on this project in the space below and attach the minimum qualifications documentation per Section 02413 1.07A to this form: t.B. Landmark Constructors, Inc.

Bidder SPECTRUM UNDERGROUND, INC.

Having carefully examined the Contract Documents and Bid Documents, bidder agrees to the terms contained therein and proposes to furnish all labor, material, and equipment for the entire Work (including mobilization and demobilization), and to execute the Contract for of Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls in the form as that contained in the Bid Documents and any and all bonds, insurance certifications and other instruments or documents as specified or included in the Contract Documents and furnish the required Performance and Payment Bond, and will completely perform the Work in strict accordance with the terms of the Contract and the Bid Documents therein referred to the following prices, to wit:

Item No. & Description	No. of Units	Units	Unit Price	Subtotal
1. Bonds and Insurance	N/A	LS	N/A	\$ 16,610.00
2. Mobilization and Demobilization (not greater than 2.5% of Base Bid)	N/A	LS	N/A	\$ 22,830.00
3. Furnish and Install 16" Pipeline Using HDD with HDPE DR 9 from Station 15+67 to Station 38+38	N/A	LS	N/A	\$ 876,475.00
4. Furnish and Install 16" Pipeline via Open Cut Trench	600	LF	\$ 259.50	\$ 155,700.00
5. Furnish and Install 6" Pipeline via Open Cut Trench	350	LF	\$ 86.00	\$ 30,100.00
6. Furnish and Install ¾" thru 3" Water Service Lines via Open Cut Trench	200	LF	\$ 48.50	\$ 9,700.00
7. Furnish and Install 16" Line Stop	1	EA	\$ 10266.00	\$ 10,266.00
8. Furnish and Install Instrumentation and Electrical for Pressure Reducing Valve	N/A	LS	N/A	\$ 64,406.00
9. Furnish and Install 16"x6" Tapping Sleeve and Valve	1	EA	\$ 7,652.00	\$ 7,652.00
10. Furnish and Install 16" BFV	4	EA	\$ 4,026.00	\$ 16,104.00
11. Furnish and Install 6" GV and Fire Hydrant	1	EA	\$ 6,023.00	\$ 6,023.00
12. Furnish and Install ARV	2	EA	\$ 4,715.00	\$ 9,430.00
13. Indemnification	N/A	LS	N/A	\$50.00
14. Miscellaneous Work and Cleanup	N/A	LS	N/A	\$ 3,500.00
15. Florida Power and Light Service Fees - Allowance	N/A	LS	N/A	\$5,000
16. Maintenance of Traffic (not greater than 1.5% of Base Bid)	N/A	LS	N/A	\$ 3,700.00
17. Materials Testing Allowance	N/A	LS	N/A	\$10,000.00
18. Excavation Below Normal Grade and Bedding Rock Refill	100	CY	\$ 59.00	\$ 5,900.00
Total Base Bid				\$ 1,253,446.00
Additive Alternate No. 1 - Furnish and Install 16" Water Meter and Vault with all Associated Instrumentation, Electrical, and Geotechnical Work				\$ 172,435.00
Total Contract Price				\$ 1,425,881.00

TOTAL CONTRACT PRICE \$1,425,881.00 and in words:

One Million Four Hundred Twenty-five Thousand Eight Hundred Eighty-one
-----and 00/100 dollars

Bidder SPECTRUM UNDERGROUND, INC.

The undersigned bidder acknowledges that Work to be performed shall conform to all Town codes and regulations. Work must be accomplished in a professional manner and meet all standards of any Professional trade requiring a license and or permit. Work must be substantially completed within 180 calendar Days from the Start Date as specified in the Notice to Proceed, barring justifiable delays. Final Completion shall be 30 calendar Days after Substantial Completion.

For the HDD portion of the WORK, the contractor will be permitted to work between the hours of 7:00 a.m. and 7:00 p.m., Monday through Saturday, on the Manatee County (Coquina Beach Park) side of Longboat Pass. On the Town of Longboat Key side of Longboat pass, the normal work hours will be between the hours of 8:00 a.m. and 5:00 p.m. with Saturday work permitted. No Sunday work is permitted. Except in the event of an emergency, no work shall be done between the hours of 5:00 p.m. and 8:00 a.m., or on Sundays or legal holidays per the Town of Longboat Key Code of Ordinances, Chapter 130.

The Contractor may ask for an extension of the allowable work hours by sending a written communication to the Engineer and must receive the written permission of the Town before starting such items of the work. The Contractor shall provide at least 48-hrs written notice for work outside of the stated allowable work hours.


(Signature of Bidder)

H.R. Sunquist, Jr., President
(Typed name of Bidder)

Doing Business As: Spectrum Underground, Inc.

Business Address: 1876-B Barber Road, Suite 200

City: Sarasota State FL Zip 34240

Fax: 941-342-6710 Phone: 941-342-6708

E-mail address: info@spectrumunderground.com

END OF SECTION

Bidder _____

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SECTION 00400

FORMS

FORMS INDEX

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MINIMUM QUALIFICATIONS (MUST BE COMPLETED AND SUBMITTED WITH BID)

Qualifying Firm Name _____

Authorized Firm Qualifying Licensed Person _____

License # _____ Type of License _____

Copy of license is attached. ____ YES ____ NO, (explain why if NO):

EQUIPMENT LIST (MUST BE COMPLETED AND SUBMITTED WITH BID)

Attach a list of equipment to be provided and used by bidder to perform the Work. (If not listed below, attach equipment list to this submittal page.

QUALIFIED WORK EXPERIENCES & REFERENCES (MUST BE COMPLETED AND SUBMITTED WITH BID)

Complete information below for a minimum five most recent clients within the past 5 years:

NAME AND SCOPE OF WORK PERFORMED: _____

Total Cost of Work performed \$ _____
Owner of Work Performed : _____ Contact Person: _____
Address: _____
City: _____ State: _____
Telephone: _____
e-mail address _____

NAME AND SCOPE OF WORK PERFORMED: _____

Total Cost of Work performed \$ _____
Owner of Work Performed : _____ Contact Person: _____
Address: _____
City: _____ State: _____
Telephone: _____
e-mail address _____

NAME AND SCOPE OF WORK PERFORMED: _____

Total Cost of Work performed \$ _____
Owner of Work Performed : _____ Contact Person: _____
Address: _____
City: _____ State: _____
Telephone: _____
e-mail address _____

NAME AND SCOPE OF WORK PERFORMED: _____

Total Cost of Work performed \$ _____
Owner of Work Performed : _____ Contact Person: _____
Address: _____
City: _____ State: _____
Telephone: _____
e-mail address _____

NAME AND SCOPE OF WORK PERFORMED: _____

Total Cost of Work performed \$ _____
Owner of Work Performed : _____ Contact Person: _____
Address: _____
City: _____ State: _____
Telephone: _____
e-mail address _____

SUBCONTRACTOR REFERENCES (MUST BE COMPLETED AND SUBMITTED WITH BID)

Identify each subcontractor that will perform 5% or more of work as part of this bid, identifying previous clients for similar Work performed over last three years. Make copies of this form as necessary. Attach information regarding additional references, if any.

Subcontractor Contact Name: _____
Company: _____
City: _____ State: _____
Current Telephone (Daytime): _____
Reference based on related Work: ☐ YES ☐ NO
Project: _____ Date completed: _____

Subcontractor Contact Name: _____
Company: _____
City: _____ State: _____
Current Telephone (Daytime): _____
Reference based on related Work: ☐ YES ☐ NO
Project: _____ Date completed: _____

Subcontractor Contact Name: _____
Company: _____
City: _____ State: _____
Current Telephone (Daytime): _____
Reference based on related Work: ☐ YES ☐ NO
Project: _____ Date completed: _____

Subcontractor Contact Name: _____
Company: _____
City: _____ State: _____
Current Telephone (Daytime): _____
Reference based on related Work: ☐ YES ☐ NO
Project: _____ Date completed: _____

Subcontractor Contact Name: _____
Company: _____
City: _____ State: _____
Current Telephone (Daytime): _____
Reference based on related Work: ☐ YES ☐ NO
Project: _____ Date completed: _____

Indicate number of additional copies of this form that are attached, if any: _____

FORM OF AFFIDAVIT WHERE BIDDER IS A CORPORATION
(MUST BE COMPLETED AND SUBMITTED WITH BID)

STATE OF _____ COUNTY OF _____

_____, being duly sworn, deposes and says: I am the
_____ of _____, the _____
_____ corporation described in and which executed the foregoing bid;
that I have been duly authorized to execute and did execute the foregoing bid pursuant to that
authorization, and that the several matters therein stated are in all respects true.

BIDDER:

Print or Type Name of Entity

By: _____
Signature Print or Type Name

Date: _____

The foregoing instrument was acknowledged before me this _____ Day of _____,
2014, by _____ (name of
officer or agent, title of officer or agent) of _____ (name of corporation
acknowledging) a _____ (state or place of incorporation), on behalf of the
corporation. He/she is personally known to me or has produced _____ as
identification and who did (did not) take an oath.

NOTARY:

Signature of Notary

Print or Type Name of Notary

Commission Number

Commission expires: _____

FORM OF AFFIDAVIT WHERE BIDDER IS A PARTNERSHIP OR JOINT VENTURE
(MUST BE COMPLETED AND SUBMITTED WITH BID)

STATE OF _____ COUNTY OF _____

_____, being duly sworn, deposes and says: I am a
general/limited (strike one) partner in _____, a
General/Limited Partnership or Joint Venture (strike one), described in and which executed the foregoing
bid; that I have been duly authorized to execute and did execute the foregoing bid pursuant to that
authorization, and that the several matters therein stated are in all respects true.

BIDDER:

Print or Type Name of Entity

By: _____
Signature Print or Type Name

Date: _____

The foregoing instrument was acknowledged before me this _____ Day of _____,
2014, by _____ (name of
acknowledging partner or agent) partner (or agent) on behalf of _____
(name of partnership. He/she is personally known to me or has produced
_____ as identification and who did (did not) take an oath.

NOTARY:

Signature of Notary

Print or Type Name of Notary

Commission Number Commission expires: _____

**FORM OF AFFIDAVIT WHERE BIDDER IS A SOLE PROPRIETOR/INDIVIDUAL
(MUST BE COMPLETED AND SUBMITTED WITH BID)**

STATE OF _____ COUNTY OF _____

_____, being duly sworn, deposes and says: I am the sole trader/individual doing business as _____, the bidder described in the foregoing bid and who executed the foregoing bid and that the several matters therein stated are in all respects true.

BIDDER:

Print or Type Name of Entity

By: _____
Signature Print or Type Name

Date: _____

The foregoing instrument was acknowledged before me this _____ Day of _____, 2014, by _____. He/she is personally known to me or has produced _____ as identification and who did (did not) take an oath.

NOTARY:

Signature of Notary

Print or Type Name of Notary

Commission Number _____ Commission expires: _____

ORGANIZATIONAL STRUCTURE
(MUST BE COMPLETED AND SUBMITTED WITH BID)

Bidders Primary Work must be construction of municipal infrastructure. The bidder must have completed 5 projects within the last 3 years that are similar in size scope and cost to this project.

BIDDER NAME, ADDRESS: _____

PHONE # _____

E-MAIL ADDRESS _____

Type of Business _____

How many years in business:_____.

How many years in business under the present business name:_____.

Under what other or former names has your organization operated:

If a corporation, answer the following:

Date of incorporation: _____

State of incorporation: _____

President's name: _____

Vice president's name(s): _____

Secretary's name: _____

Treasurer's name: _____

If a partnership or joint venture, answer the following:

Date of organization: _____

Type of partnership (if applicable): _____

Name(s) of general partners: _____

If individually owned, answer the following:

Date of organization: _____

Name of owner: _____

ORGANIZATIONAL CLAIMS AND SUITS (MUST BE COMPLETED AND SUBMITTED WITH BID)

Claims and suits (if the answer to any of the questions below is yes, please attach details).

Has your organization ever failed to complete any Work awarded to it?
____ NO ____ YES (details attached)

Are there any judgments, claims, and arbitration proceedings or suits pending or outstanding against your organization or officers?
____ NO ____ YES (details attached)

Has your organization filed any lawsuits or requested arbitration with regard to construction contracts within the last five years?
____ NO ____ YES (details attached)

Has your organization been named as a defendant or brought in as a party to any lawsuits within the last five years? ____ NO ____ YES (details attached)

Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract?
____ NO ____ YES (details attached)

BID BOND (MUST BE COMPLETED AND SUBMITTED WITH BID)

KNOW ALL MEN BY THESE PRESENTS, that we (hereinafter called the Principal) and (hereinafter called the Surety), a Corporation chartered and existing under the Laws of the State of _____, and authorized to do business in the State of Florida, are held and firmly bound unto the Town of Longboat Key, Longboat Key, Florida, in the full and just sum of dollars \$ _____ (written amount: _____) good and lawful money of the United States of America, to be paid upon demand of the Town, to which payment will and truly be made, we bind ourselves, our heirs, executors administrators, successors, and assigned jointly and severally and firmly by these presents.

WHEREAS, the Principal is about to submit, or has submitted to the Town, a Bid Proposal for the purpose of

WHEREAS, the Principal desires to file this Bond in lieu of a certified Bidder's check otherwise required to accompany this Bid Proposal;

NOW THEREFORE, the conditions of this obligation are such if the Bid Proposal is accepted, the Principal shall, within ten (10) Days after the date of receipt of written Notice of Award of Contract execute a Contract for Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls in accordance with the Bid Proposal and upon the terms, conditions and price set forth therein, in the form and manner contained in the Contract Documents and execute a sufficient and satisfactory Public Construction Payment and Performance Bond payable to Town, in the amount of 100 percent (100%) of the total Contract Sum, in form and with surety satisfactory to said Town, then this obligation to be void, otherwise to be and remain in full force and virtue in law, and the surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the aforesaid Town, upon demand, the amount of this Bond, in good and lawful money of the United States of America, not as a penalty, but as liquidated damages.

In the event the numerical expression is omitted or expressed as less than five percent (5%) of the total bid price, this figure shall be assumed to be erroneously stated and this bid bond shall be binding upon the Principal and Surety in the amount of five percent (5%) of the total bid price.

In testimony thereof, the Principal and Surety have caused these presents to be duly signed and sealed this

_____ Day of _____, 2014.

Principal
by _____

seal

Surety
by _____

seal

Countersigned _____
Local Producing Agent for _____

seal

State of Florida, County of Sarasota

The foregoing instrument was acknowledged before me this _____ Day of _____, 2014, by _____, who is personally known to me or who has produced _____, as identification and who did (did not) take an oath and who acknowledged before me that he executed the same for the purposes therein expressed on behalf of said corporation.

NOTARY PUBLIC

Typed Name

Commission

Expires: _____

- NOTES:
1. Write in the dollar amount of the bond, which must be at least five percent (5%) of the total of the Base Bid included in the Proposal.
 2. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.
 3. Attorney-in-fact who sign Bid Bonds or Contract Bonds must file with each bond a certified and effectively dated copy of their power of attorney.

STATEMENT OF COMPLIANCE WITH TRENCH SAFETY ACT

Florida Statutes Section 553.60

(MUST BE COMPLETED AND SUBMITTED WITH BID)

Trench Safety Act Compliance

Bidder acknowledges that the Florida Trench Safety Act, Section 553.60 et seq., which became effective October 1, 1990, shall be in effect during the period of construction of the project. Bidder by signing and submitting the bid is, in writing, assuring that it will perform any trench excavation in accordance with the applicable trench safety standards as well as the method of compliance.

Method of Compliance

Cost

Bidder acknowledges that this cost is included in the applicable items of the bid and in the Total Base Bid. Failure to complete the above may result in the bid being declared non-responsive.

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

BIDDER:

Print or type name of entity

By: _____
Signature

Print or type name

Print or type title

Date

DRUG FREE WORKPLACE CERTIFICATION (MUST BE COMPLETED AND SUBMITTED WITH BID)

Identical Tie Bids: Preference shall be given to businesses with drug free Workplace programs. If two or more bids are equal with respect to price, quantity, and service then a bid received from a business that certifies that it has implemented a drug free Workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if all or none of the tied vendors have or do not have a drug free Workplace program (Florida Statutes Section 287.087). 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 action 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's policy of maintaining a drug free Workplace, and 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 subsection (1).
4. In the statement specified in subsection (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 no later than five Days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug free Workplace through implementation of this section.

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

BIDDER:

Print or type name of entity

By: _____
Signature

Print or type name

Print or type title

Date

Drug Free Workplace Certification, page 2 of 2

State of Florida, County of Sarasota

The foregoing instrument was acknowledged before me this _____ Day of _____, 2014, by _____, who is personally known to me or who has produced _____, as identification and who did (did not) take an oath and who acknowledged before me that he executed the same for the purposes therein expressed on behalf of said corporation.

NOTARY PUBLIC

Typed Name

Commission Expires:_____

EQUAL EMPLOYMENT OPPORTUNITY (MUST BE COMPLETED AND SUBMITTED WITH BID)

The Town of Longboat Key is an Equal Opportunity/Affirmative Action Employer.

Pursuant to Executive Order 11346 as amended, you are advised that under the provisions of government contracting, Contractors and Subcontractors are obliged to take affirmative action to provide equal employment opportunity without regard to race, creed, color, national origin, age or sex.

CERTIFICATION BY PROPOSED PRIME OR SUBCONTRACTOR
REGARDING EQUAL EMPLOYMENT OPPORTUNITY

This certification is authorized pursuant to Executive Order 11246, Part II, Section 203(b), (30 F. R. 12319-15). Any Bidder or prospective Contractor, or any of the proposed Subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous Contract or subcontract to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicated that the prime or Subcontractor has not filed a compliance report due under applicable instruction, such Contractor shall be required to submit a compliance report.

(Signature of Bidder)

(Typed name of bidder)

Phone # _____ Fax # _____ e-mail _____

Address: _____

1. Bidder has participated in a previous contract or subcontract, subject to the Equal Opportunity Clause: YES____ NO____

2. Compliance Reports were required to be filed in connection with such contract or subcontract: YES____ NO____

If YES, state what reports were filed and with what agency.

3. Bidder has filed all compliance reports due under applicable instructions: YES____ NO____

If answer to Item 3 is NO, please explain in detail on revise side of this certification.

END OF SECTION

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**CONTRACT FOR POTABLE WATER SYSTEM SUBAQUEOUS CROSSING OF
LONGBOAT PASS AND SYSTEM PRESSURE CONTROLS 14-002**

This Contract For Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls (hereinafter "Contract") is entered into by and between the Town of Longboat Key, 501 Bay Isles Road, Longboat Key, FL 34228, a Municipality organized under the laws of the State of Florida (hereinafter "Town" or "Owner"), and **Spectrum Underground, Inc.**, whose address is 1876-B Barber Rd, Suite 200, Sarasota, Fl 34240, (hereinafter "Contractor"), as of the date appearing on the signature lines below.

Article 1 - WORK

Contractor shall complete all work as specified or indicated in the Technical Specifications, Plans prepared by CDM Smith, dated February 2014 and all Contract Documents as enumerated herein and in accordance with the General Conditions incorporated herein by reference. The work (hereinafter "Work") is generally described as Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls all as more fully stated in this Contract and the Contract Documents.

Article 2 - ENGINEER

The project has been designed by CDM Smith, (hereinafter "Engineer" and sometimes referred to as "Professional" in the General Conditions and other Contract Documents). The Engineer is to act as Owner's representative and assume all duties and responsibilities and have the rights and authority assigned to Engineer or Professional in the Contract Documents in connection with completion of the work in accordance with the Contract Documents.

Article 3 - CONTRACT TIME

3.1 The Contract Time (as defined in the General Conditions incorporated by reference into this Contract) shall commence to run on the date specified in the Notice to Proceed, which Notice to Proceed shall be issued following execution of this Contract, and shall become part of the Contract Documents.

3.2 The Work shall be substantially completed within 180 calendar days from the date the Contract Time commences to run as specified in the Notice To Proceed, and all Work shall be completed, accepted, and ready for final payment within 210 calendar days after the date the Contract Times commence to run as specified in the Notice to Proceed.

3.3 Liquidated Damages. Owner and Contractor recognize and agree that time is of the essence of this Contract and for the Work to be performed pursuant to this Contract and the Contract Documents, and that Owner will suffer financial loss if the Work is not completed within the times specified in this Contract and the Contract Documents, plus any extensions thereof allowed in accordance with Article 13 of the General Conditions. They also recognize and agree that the delays, expense and difficulties involved in proving the actual loss or damages suffered by Owner if the Work is not completed within the time specified by this Contract and the Contract Documents render proof of actual loss uncertain. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay in completion of the Work, Contractor shall pay Owner \$1,000.00 for each Day that expires after the date for Substantial Completion as specified

in or calculated with reference to the Notice to Proceed. Contractor shall pay Owner \$500.00 for each Day that expires after the date for Final Completion as specified in or calculated with reference to the Notice to Proceed. The parties specifically agree that the liquidated damages provided for herein do not constitute a penalty. Any liquidated damages imposed pursuant to this provision and the Contract Documents shall be deducted and retained out of any monies otherwise payable to the Contractor. If insufficient funds are otherwise payable to the Contractor so that the full amount of liquidated damages cannot be deducted and retained, the Contractor and the sureties for the Contractor shall be liable to the Owner for all such sums.

Article 4 - CONTRACT SUM

4.1 The Town shall pay Contractor for completion of the Work in accordance with this Contract and the Contract Documents an amount in current funds at the Contract Sum or Unit Price Work as presented in the Submitted Bid Form, which is incorporated herein and made a part hereof by this reference.

4.2 The Town shall pay Contractor for completion of the Work in accordance with this Contract and the Contract Documents an amount in current funds equal to the amount below:

A Contract Sum of:

\$1,425,881.00 - One Million Four Hundred Twenty-five Thousand Eight Hundred Eighty-one Dollars *

*** This Contract Sum is based upon the unit prices and extensions thereof as stated in Contractor's Submitted Bid, and the actual total amount to be paid to Contractor may be less than the stated Contract Sum, but will not exceed the stated Contract Sum.**

4.3 The Town and Contractor expressly agree that the Contract Sum is a stipulated sum which is based upon the unit prices and extensions thereof as stated in Contractor's Submitted Bid. Estimated quantities are not guaranteed, and determinations of actual quantities and classification are to be made by Engineer.

Article 5 - PAYMENT PROCEDURES

5.1 Contractor shall submit applications for payment in accordance with Article 15 of the General Conditions incorporated by reference into this Contract and the Technical Specifications.

5.2 Progress Payments. Owner shall make progress payments on account of the Contract Sum on the basis of Contractor's applications for payment and as recommended by Engineer, as specified in the General Conditions. All progress payments will be measured by Unit Price Work based on the number of units completed.

5.2.1 Retainage. Prior to Substantial Completion, progress payments will be made in an amount equal to 90 percent (90%) of each approved progress payment pending satisfactory completion of each of all Work described in this Contract and the Contract Documents.

5.3 Final Payment. Upon Final Completion and acceptance of all of the Work to be performed pursuant to this Contract and the Contract Documents, Owner shall pay the remainder of the Contract Sum as recommended by the Engineer as specified in Article 15 of the General Conditions and the Technical Specifications.

Article 6 - CONTRACTOR'S REPRESENTATIONS

In order to induce Owner to enter into this Contract, Contractor makes the following representations, upon which the Owner has actually and justifiably relied:

6.1 That Contractor has examined and carefully studied all Contract Documents, and that Contractor has the experience, expertise and resources to perform all required Work as specified within the times stated in this Contract and the Contract Documents.

6.2 That Contractor has visited the site and at least a fair representative sample of the Project Area and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, performance or furnishing of the Work to be performed pursuant to this Contract and the Contract Documents.

6.3 That Contractor is familiar with and can and shall comply with all federal, state, and local laws and regulations that may affect cost, progress, performance, and furnishing of the Work to be performed pursuant to this Contract and the Contract Documents.

6.4 That Contractor has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all Drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site. Contractor acknowledges that the Town and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Contract Documents with respect to physical conditions, including, but not limited to Underground Facilities at or contiguous to the site. Contractor has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto. Contractor does not consider that any additional examinations, investigations, explorations, tests, studies, or data are necessary for the performance and furnishing of the Work at the Contract Sum, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.

6.5 That Contractor is aware of the general nature of work to be performed by Owner and others at the site, if any, that relates to the Work to be performed pursuant to this Contract and the Contract Documents.

6.6 That Contractor has correlated the information known to Contractor, information and observations obtained from visits to the site, specifications, and Drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

6.7 That Contractor has given Engineer written notice of all conflicts, errors, ambiguities or discrepancies that Contractor has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Contractor, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work to be performed pursuant to this Contract and the Contract Documents.

6.8 That Contractor has had duly issued and executed all required Payment and Performance Bonds and Certificates of Insurance required by this Contract and the Contract Documents.

Article 7 - CONTRACT DOCUMENTS

The Contract Documents which comprise the entire agreement between Owner and Contractor concerning the scope and nature of the Work, and its performance, consist of the following which are incorporated by reference:

7.1 This Contract;

7.2 The General Conditions attached hereto;

7.3 The Plans, Technical Specifications, prepared by the Engineer relative to this Project, all as more specifically described in this Contract, the Invitation to Bidders, Instructions to Bidders and the General Conditions;

7.4 Certificates of Insurance, with endorsements, Performance and Payment Bond, Bid Bond, Notice of Award, Notice to Proceed, Change Orders and Construction Change Directives;

7.5 The following, which may be delivered or issued after the Effective Date of the Contract, and are not attached hereto: all written Amendments, Addenda and other documents amending, modifying, or supplementing the Contract Documents;

7.6 The Invitation to Bid, Instructions to Bidders, and all completed Bid Submittal Forms.

Article 8 - MISCELLANEOUS

8.1 Terms used in this Contract, which are defined in the Bid Documents, General Conditions or other Contract Documents, shall have the meanings indicated in the Bid Documents, General Conditions or other Contract Documents as the case may be.

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

8.3 Contractor binds itself, its partners, successors, assigns, and legal representatives to the Town and any of the Town's successors, assigns, and legal representatives of the Town in respect of all covenants, contracts, and obligations contained in this Contract and the Contract Documents. No employees, agents or representatives of the Town are personally or individually bound by this Contract.

8.4 Any provision or part of this Contract or the Contract Documents held to be void or unenforceable under any law or regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that this Contract and the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

8.5 Notice Provision: Any notice or other communications concerning material changes to the Contract, shall be sent via facsimile or certified U.S. Mail, return receipt requested, postage prepaid to the addresses listed below.

To Owner:

Dave Bullock, Town Manager
Town of Longboat Key
Town Hall
501 Bay Isles Road
Longboat Key, FL 34228
Facsimile: (941) 316-1656

Juan J. Florensa, Public Works Director
Town of Longboat Key
Public Works Building
600 General Harris
Longboat Key, FL 34228
Facsimile: (941) 316-1984

With Copy to:
Karen Lowe, P.E.
CDM Smith
1715 North Westshore Blvd
Suite 875
Tampa, FL 33607

Maggie Mooney-Portale, Esq.
Persson & Cohen, P.A.
6853 Energy Court
Lakewood Ranch, FL 34240-8523
Facsimile: (941) 306-4832

To Contractor:

H.R. Sunquist, Jr., President
Spectrum Underground, Inc.
1876-B Barber Road, Suite 200
Sarasota, Florida 34240
Facsimile: (941) 342-6710
E-mail: info@spectrumunderground.com

Article 9 - TERMINATION OF AGREEMENT

9.1 Termination: The Town for any reason may terminate this Contract at any time by giving at least thirty (30) days written notice to the Contractor. Notwithstanding, the Town may terminate this Contract immediately upon any lapse in the insurance coverage to be retained by the Contractor, or failure to fulfill any of the insurance requirements as provided herein. In this event, Contractor shall be entitled to compensation for any satisfactory work completed prior to termination in accordance with this Contract.

9.2 Effect of Termination: In the event this Contract is terminated for any reason, finished or unfinished documents, data, studies, correspondence, reports and other products prepared by or for Contractor under this Contract shall be made available to and for the exclusive use of the Town at no additional cost to the Town.

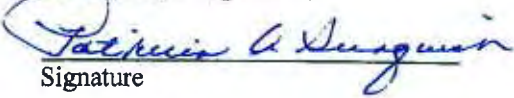
Article 10 - PUBLIC RECORDS

Pursuant to applicable Florida law, the Contractor's records associated with this Contract may be subject to Florida's public records laws, Florida Statutes, 119.01, et. seq., as amended from time to time. Contractor shall comply with all public records laws, including those obligations to keep, maintain, provide access to, and maintain any applicable exemptions to public records, and transfer all such public records to the Town at the conclusion of the Contract, as provided for in Section 119.0701, Florida Statutes.

IN WITNESS WHEREOF, the parties hereto have made and executed this CONTRACT as of the day and year last written below. OWNER AND CONTRACTOR have signed this Contract in two originals in counterpart. One counterpart each has been delivered to the OWNER and the CONTRACTOR. All portions of the Contract Documents have been signed, initialed or identified by OWNER and CONTRACTOR or identified by ENGINEER on their behalf.

ATTEST:

As to (H.R. Sunquist, Jr.)


Signature

Patricia A Sunquist
(Print or Type Name)

Secretary/Treasurer
(Print or Type Title)

Date: 5-15-14

Seal:

CONTRACTOR

Spectrum Underground, Inc.

By: 

Its: President
(Title of Authorized Representative)

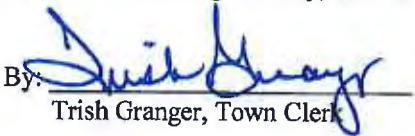
H.R. Sunquist, Jr.
(Print or Type Name)

President
(Print or Type Title)

Date: 5-15-14

ATTEST:

As to Town of Longboat Key, Florida

By: 
Trish Granger, Town Clerk

Date: 5-19-14

Seal:

OWNER

Town of Longboat Key, Florida

By: 
Dave Bullock, Town Manager

Date: 5-19-14

Review of Contract as to Form:

By: 
Maggie Mooney-Portale, Esq., Town Attorney

SECTION 00700

GENERAL CONDITIONS

ARTICLE 1 - CONTRACT DOCUMENTS

- 1.0 The Contract Documents comprise the entire contract between the Town and the Contractor and shall consist of the documents listed in Article 7 of the Contract for Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls (hereinafter "Contract"):

ARTICLE 2 - DEFINITIONS

- 2.0 Whenever used in any of the Contract Documents, the following meaning shall be given to the terms herein defined:
- .1 The term **Addendum or Addenda** means any changes, revisions or clarifications of the Contract Documents, which have been duly issued by the Town to prospective Bidders prior to the time of receiving Bids.
- .2 The term **Amendment** means written modification to the Contract Documents, signed by Town and Contractor, on or after the Effective Date of the Contract and normally dealing with non-engineering or non-technical aspects of the Work.
- .3 The term **Application for Payment** means the pay request accepted by Professional or Town which is to be used by Contractor in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
- .4 The term **Bid Documents** means the Public Notice, Invitation to Bid, all Forms contained in the Bid Documents, Definitions, Instructions to Bidders, Technical Specifications, General Conditions, , submitted bid forms, proposed Contract Documents, addenda issued prior to public bid opening, , Drawings and other material provided as Bid Documents to define the Work.
- .5 The term **Bid Proposal** means the offer or proposal of the Bidder submitted on the prescribed form setting forth the price(s) for the Work to be performed.
- .6 The term **Bonds** means the Bid and Public Construction Payment and Performance Bond and other instruments of security furnished by the Contractor and its Surety in accordance with the Contract Documents.
- .7 The term **Change Order** means a written recommendation by Engineer, signed by Contractor and Town, which authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Sum or the Contract Time, issued on or after the Effective Date of the Contract.
- .8 The term **Construction Change Directive** means a written Directive for changes in the Work, which, if not expeditiously implemented, might delay the project. In contrast to a Change Order, a Construction Change Directive is to be used where owner and Contractor have not reached agreement on proposed changes in Contract Sum or Contract Time. Upon receipt of such directive, Contractor must promptly proceed with the change in the Work described. A Construction Change Directive will not change the Contract Sum or the Contract Time, but is evidence that the parties expect that the change directed or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, of the Contract Sum or Contract Time.
- .9 The term **Contractor** means the person, firm or corporation entering into the Contract with the Town to perform the Work as defined in the Contract and Contract Documents.

- .10 The term **Contract Documents** means the Contract, General Conditions, Plans and Specifications prepared by the Engineer relative to this project, Certificates of Insurance with endorsements, Performance and Payment Bond, Bid Bond, Notice of Award, Notice to Proceed, Change Orders, Construction Change Directives, Amendments, Addenda, Supplementary Conditions, and the Bid Documents.
- .11 The term **Contract Sum** means the moneys payable by Town to Contractor for completion of the Work in accordance with the Contract Documents.
- .12 The term **Contract Time**, unless otherwise provided, means the period of time as stated in the Notice To Proceed, including adjustments by Change Order, allotted in the Contract Documents for Substantial Completion of the Work.
- .13 The term **Defective** means an adjective which when modifying the word "Work" refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents.
- .14 The term **Day** is a calendar day. If a calendar Day shall fall on a legal holiday that Day will be omitted from the computation of Days for total Contract Time. Legal Holidays: New Year's Day, Martin Luther King Day, Memorial Day, 4th of July, Labor Day, Veterans Day, Thanksgiving Day and the following Friday, and Christmas Day.
- .15 The term **Drawings** means the Drawings as specifically referred to as such (or as "plans") in these documents or addenda that are produced by the Engineer. Drawings or plans issued after the execution of the contract to explain further or to illustrate, or to show changes in Work, will be known as "supplementary Drawings" and shall be binding upon the Contractor with the same force as the Drawings.
- .16 The term **Effective Date of the Contract** means the last date on which the Contract has been signed by either party to the Contract.
- .17 The term **Engineer** means CDM Smith, or its authorized representatives acting within the scope of duties established by contract with the Town. The term shall also encompass the term "Professional".
- .18 The term **Field Order** means a written direction to the Contractor from the Professional that modifies Technical Specifications, Drawings or any other Contract Document without changing Contract Sum or Contract Time.
- .19 The term **Final Completion** means the stage at which all incomplete and Defective Work has been completed or corrected in accordance with Contract Documents.
- .20 The term **Financial Specialist** means the representative of the Town Finance Department.
- .21 The Term **Milestone** means a principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of the Work.
- .22 The term **Notice of Award** means the written notice issued by the Town to the successful bidder.
- .23 The Term **Notice of Bid Action** means written notice by Town to all bidders stating the apparent successful bidder. A Contract in the form of the Contract for the Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls contract included in the Bid Documents will be executed by the Town upon compliance by the apparent successful bidder with conditions set forth in the Bid Documents.
- .24 The term **Notice to Proceed** means a written notice issued by the Town to the Contractor fixing the date on which the Contract Time will commence and upon which the Contractor shall start to perform the obligations under the Contract Documents, unless otherwise specified in the Notice

to Proceed. The actual Start Date shall be within ten (10) Days of Notice to Proceed date or when all applicable Permits have been secured, unless otherwise stated.

- .25 The term **Permits** means any regulatory agency, Federal, State, County or local that requires Permits for Work being performed.
- .26 The term **Professional** means the Architectural/Engineering firm or individual retained by the Town or in-house licensed person designated to perform the design and/or resident Engineer services for the Work. The term shall also encompass the term "Engineer".
- .27 The term **Proposal Request** – is a written request used to obtain price quotations required in the negotiation of Change Orders.
- .28 The term **Project Area** (also sometimes referred to as "Site" in the Contract Documents) means the area within which are the specified contract limits of the improvements contemplated to be constructed in whole or in part under the Contract Documents.
- .29 The term **Project Manager** means Town representative in charge, employed by said Town, for the purpose of directing or having in charge the Work provided for in the Contract and the Contract Documents.
- .30 The term **Site** means the area of Work for this project as indicated on the Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls contract documents.
- .31 The term **Supplementary Conditions** means any additional or supplementary conditions, if any, prepared and attached to and incorporated in the General Contract at the time of the execution of the General Contract.
- .32 The term **Substantial Completion** means the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer as evidenced by Engineer's definitive certificate of Substantial Completion, it is sufficiently complete and in accordance with the contract, so that the Work (or a specified part) can be utilized for the purposes for which it is intended; or, if no such certificate is issued, when the Work is complete and ready for final payment.
- .33 The term **Start Date** means the date of commencement of the Work.
- .34 The term **Subcontractor** means 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.
- .35 The term **Specifications** – means descriptions of materials, equipment, construction systems, standards and Workmanship as applied to the Work and applicable administrative details as listed in or contained or specified in the Technical Specifications or other Contract Documents.
- .36 The term **Technical Reports** means the reports issued by the Town Contractor or Project Manager consisting of written technical material.
- .37 The term **Town** means the Town of Longboat Key, a Municipality organized under the laws of the State of Florida (also, sometimes referred to as "Owner").
- .38 The Term **Underground Facilities** means all pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: Electricity, Gas, Steam, Liquid Petroleum Products, Telephone or other Communications, Cable Television, Sewage and Drainage Removal, Traffic or other Control Systems, or Water.
- .39 The term **Unit Price Work** means Work to be paid for on the basis of unit prices.

- .40 The term **Work** means the entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment in the construction and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

ARTICLE 3 - PRELIMINARY MATTERS

3.1 Delivery of Bonds and Insurance Certificates

3.1.1 When the Contractor delivers the executed Contract to the Town, the Contractor shall also deliver to the Town the original and fully completed Payment and Performance Bonds and Insurance Certificates specified by the Contract Documents, including, but not limited to those matters and documents specified in Article 3.5.3 of these General Conditions. Failure to timely deliver said Bonds and evidence of insurance will be deemed the breach of a material condition precedent to the entry into a General Contract and shall prevent the formation of any contract between the Town and the successful bidder.

3.2 Copies of Documents

3.2.1 After the award of the Contract, the Town shall furnish the Contractor, at no cost, a maximum of five (5) sets of plans and Contract Documents for execution of the Work.

3.3 Commencements of Contract Times; Notice to Proceed

3.3.1 The Contract Time shall commence as established in the Notice to Proceed. A Notice to Proceed may be given at any time after the Effective Date of the Contract.

3.4 Starting the Work

3.4.1 The Contractor shall begin the Work on the date the Contract Time commences. No Work shall be done prior to the date on which the Contract Time commences. Any Work performed by the Contractor prior to date on which Contract Time commences shall be at the sole risk of the Contractor.

3.5 Before Starting Construction

3.5.1 Before undertaking each part of the Work, the Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. The Contractor shall promptly report in writing to the Professional any conflict, error, defect, ambiguity or discrepancy which the Contractor may discover in the Contract Documents and shall obtain a written interpretation or clarification from the Professional before proceeding with any Work affected thereby. The Contractor shall be liable to the Town for failure to report any conflict, error, defect, ambiguity or discrepancy in the Contract Documents, if the Contractor knew or reasonably should have known thereof.

3.5.2 Within fifteen (15) Days after the Notice to Proceed (unless otherwise specified in the Contract Documents), the Contractor shall submit to the Professional and the Project Manager for review and ultimate approval the following:

3.5.2.2. Contractor's proposed Work schedule showing start and completion dates of Work to be performed.

3.5.2.3. A preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Sum and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction or a schedule with sufficient breakdown of lump sum prices to identify items of Work and show retainage. Such amounts will include an appropriate amount of overhead and profit applicable to each item of Work.

3.5.2.4. A copy of the schedule of values shall be sent to the Project Manager and the Professional.

3.5.3 Prior to the Effective Date of the Contract, the Contractor shall deliver to the Town, an executed Insurance certificate, ACORD form # 25-S (7/97), in the amounts not less than identified in Article 6. The Accord certificate shall include separate endorsements for each insurance policy identified in the Accord certificate showing the Town as an additional insured, original policy or certified copies of each insurance policy (and other evidence of insurance which the Town may reasonably request) which the Contractor is required to purchase and maintain in accordance with Article 6.

3.5.4 Before any Work at the site is started and within 10 Days of the Notice To Proceed, a pre-construction conference scheduled by the Contractor, Project Manager, Professional and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in 3.5.2, procedures for handling Shop Drawings and other submittal, processing applications for payment and maintaining required records.

3.5.5 Unless otherwise provided in the Contract Documents, at least ten (10) calendar Days before submission of the first Application for Payment a conference attended by the Contractor, Project Manager, Professional and others as appropriate will be held to review for acceptability to the Professional the schedules submitted in accordance with 3.5.2. Contractor shall have an additional ten (10) calendar Days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to the Contractor until the schedules are submitted to and acceptable to the Professional. The progress schedule will be acceptable to the Professional as providing an orderly progression of the Work to completion within any specified Milestones and the Contract Time, but such acceptance will neither impose on the Professional responsibility for the sequencing, scheduling or progress of the Work nor interfere with or relieve the Contractor from Contractor's full responsibility therefore. The Contractor's schedule of Shop Drawing and Sample submissions will be acceptable to the Professional as providing a workable arrangement for reviewing and processing the required submittal. The Contractor's schedule of values shall be approved by the Professional as to form and substance.

3.5.5.1 The Contractor, in addition to preparing an initially acceptable schedule, shall be responsible for maintaining the schedule, including updating the schedule. Schedule updates shall include progression of Work as compared to scheduled progress on Work. Schedule updates shall accompany each pay request.

ARTICLE 4 - CONTRACT DOCUMENTS, INTENT, DISCREPANCIES, AMENDING, AND REUSE

4.1 Precedence

4.1.1 The Contract Documents comprise the entire Contract between the Town and the Contractor concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the Laws of the State of Florida.

4.1.2 It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished by and performed by the Contractor with no change to the Contract Sum whether or not specifically called for. When words or phrases, which have a well-known technical or construction industry or trade meaning, are used to describe Work, materials or equipment, such words or phrases shall be interpreted in accordance with that meaning. Clarifications and interpretations of the Contract Documents shall be issued by the Professional.

4.1.3 Except as otherwise specifically stated in the Contract Documents, or as may be provided by Amendment or supplement thereto issued by one of the methods indicated in 4.3.1 or 4.3.2, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract Documents and the provisions of any such standard, specification, manual, code or instruction (whether or not specifically incorporated by reference in the

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

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

4.2 Conflicts

4.2.1 If during the performance of the Work, the Contractor discovers any conflict, error, defect, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such Law or Regulation applicable to the performance of the Work or of any such standard, specification, manual or code or of any instruction of any supplier, the Contractor shall report it to the Professional in writing at once, and, the Contractor shall not proceed with the Work affected thereby (except in an emergency) until an Amendment or supplement to the Contract Documents has been issued by one of the methods indicated in 4.3.1 or 4.3.2. The obligation of the Contractor as stated herein is in addition to the obligation of the Contractor pursuant to 3.5.1

4.2.2 No provision of any such standard, specification, manual, code or instruction shall be effective to change the duties and responsibilities of the Town, Contractor or Professional, or any of their Subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to the Town, Professional or any of the Professional's Consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of 10.7.1 or any other provision of the Contract Documents.

4.3 Amending

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

4.3.2 In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways:

4.3.2.1 a Field Order

4.3.2.2 Professional's written interpretation or clarification

4.4 Reuse of Documents

4.4.1 The Contractor, and any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with the Town shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications or other Contract Documents (or copies of any thereof) prepared by or bearing the seal of the Professional or Professional's consultant, and shall not reuse any of such Drawings, Specifications, other Contract Documents or copies on extensions of the Project or any other project without written consent of the Town and specific written verification or adoption by the Professional.

ARTICLE 5 - PROJECT CONDITIONS

5.1 Availability of Lands

5.1.1 The Town shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of the Contractor. Upon reasonable written request, the Town shall furnish the

Contractor with a correct statement of record legal title and legal description of the lands upon which the Work is to be performed. The Town shall identify any encumbrances or restrictions not of general application, but specifically related to use of lands so furnished with which the Contractor will have to comply in performing the Work. Necessary easements or rights-of-way will be obtained and expenses will be borne by the Town. If the Contractor and the Town are unable to agree on entitlement to or the amount or extent of any adjustments in the Contract Sum or the Contract Times as a result of any delay in the Town's furnishing these lands, rights-of-way or easements, the Contractor may make a claim therefore as provided in Articles 12 and 13. The Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.2 Subsurface Physical Conditions

5.2.1 Reference is made to the Technical Specifications and other pertinent provisions of the Contract Documents for identification of those reports of exploration and tests of subsurface conditions at or contiguous to the Project Area that have been utilized in preparing the Contract Documents, and those Drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) that have been utilized in preparing the Contract Documents.

5.3 Limited Reliance by Contractor Authorized Technical Data

5.3.1 The Contractor may rely upon the general accuracy of the technical data contained in the Contract Documents only to the extent specified in the Technical Specifications. Except for such reasonable general reliance on such technical data, the Contractor may not rely upon or make any claim against the Town, Professional, or any of Professional's Consultants with respect to:

5.3.1.1 the completeness of any reports, drawings or other portions of the Contract Documents for the Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by the Contractor and safety precautions and programs incident thereto, or

5.3.1.2 other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings, or

5.3.1.3 Any Contractor interpretation or conclusion drawn from any technical data, opinions or information.

5.4 Unknown or Concealed Conditions

5.4.1 If conditions are encountered, excluding Underground Facilities, at the Project Area which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) 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, then the Contractor shall give the Town notice, through the Professional, thereof promptly before conditions are disturbed and in no event later than 48 hours after first observance of the conditions.

5.4.2 The Project Manager and Professional shall promptly investigate such conditions, and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, the Project Manager and Professional shall recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Project Manager and Professional determine that the conditions at the Site are not materially different from those indicated in the Contract Documents or are not materially different from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents and that no change in the terms of the Contract Sum and/or Contract Time is justified, the Professional shall notify the Contractor of the determination in writing. The Work shall be performed after direction is provided by the Professional.

5.5 Physical Conditions - Underground Facilities

5.5.1 The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Project Area is based on information and data furnished to the Town or the Professional by the owners of such Underground Facilities or by others.

5.5.1.1 The Town and Professional shall not be responsible for the accuracy or completeness of any such information or data; and

5.5.1.2 The cost of all of the following will be included in the Contract Sum and the Contractor shall have full responsibility for (i) reviewing and checking all such information and data, (ii) locating all Underground Facilities shown or indicated in the Contract Documents, (iii) coordination of the Work with the owners of such Underground Facilities during construction, and (iv) the safety and protection of all such Underground Facilities, and repairing any damage thereto resulting from the Work.

5.5.2 If an Underground Facility is uncovered or revealed at or contiguous to the Project Area which was not shown or indicated in the Contract Documents, the Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency), identify the owner of such Underground Facility and given written notice to that owner and to the Town through the Professional. The Project Manager and Professional will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence of the Underground Facility. If the Project Manager concludes that a change in the Contract Documents is required, a Change Order will be issued as provided in Article 11 to reflect and document such consequences. During such time, the Contractor shall be responsible for the safety and protection of such Underground Facility. The Contractor shall be allowed an increase in the Contract Sum or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and that the Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence and nature of such Underground Facility. If the Town and the Contractor are unable to agree on entitlement to or the amount or length of any such adjustment in Contract Sum or Contract Time, the Contractor may make a claim, therefore as provided in Articles 12 and 13. The Town and the Professional shall not be liable to the Contractor for any claims, costs, losses or damages incurred or sustained, direct or indirect, consequential, incidental or otherwise, by the Contractor on or in connection with any other project or anticipated project.

5.6 Reference Points

5.6.1 The Town through its Professional, shall provide the Contractor reference points for construction, which in the Town's judgment are necessary to enable the Contractor to proceed with the Work. The Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of the Town. The Contractor shall report to the Professional whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

5.7 Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material

5.7.1 The Town shall be responsible for any Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the Project Area which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work and which may present a substantial danger to persons or property exposed thereto in connection with the Work at the Project Area. The Town shall not be responsible for any such materials brought to the site by the Contractor, Subcontractor, Suppliers or anyone else for whom Contractor is responsible.

5.7.2 The Contractor shall immediately: (i) stop all Work in connection with such hazardous condition and in any area affected thereby (except in an emergency as required by 7.12), and (ii) notify the Town and the Professional (and thereafter confirm such notice in writing). The Town shall promptly consult

with the Professional concerning the necessity for the Town to retain a qualified expert to evaluate such hazardous condition or take corrective action, if any. The Contractor shall not be required to resume Work in connection with such hazardous condition or in any such affected area until after the Town has obtained any required Permits related thereto and delivered to the Contractor special written notice (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (ii) specifying any special conditions under which such Work may be resumed safely. If the Town and the Contractor cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Sum or Contract Times as a result of such Work stoppage or such special conditions under which Work is agreed by the Contractor to be resumed, either party may make a claim therefore as provided in Articles 12 and 13.

5.7.3 If after receipt of such special written notice, the Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then the Contractor may order such portion of the Work that is in connection with such hazardous conditions or in such affected area to be deleted from the Work. If the Town and the Contractor cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Sum or Contract Times as a result of deleting such portion of the Work, then either party may make a claim therefore as provided in Articles 12 and 13. The Town may have such deleted portion of the Work performed by the Town's own forces or others in accordance with Article 8.

ARTICLE 6 - BONDS, INSURANCE, INDEMNIFICATION

6.1 Public Construction Bond and Other Bonds:

6.1.1 The Contractor shall furnish a Public Construction Bond, in an amount equal to the Contract Sum as security for the faithful performance and payment of all the Contractor's obligations under the Contract Documents. This Bond shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. The Contractor shall also furnish such other Bonds as may be required by any Supplementary Conditions. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department, and A.M. Best rated A-8 or better.

6.1.2 The Contractor shall be required to furnish additional coverage for added Work.

6.1.3 If the surety on any bond furnished by the Contractor is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state, or it ceases to meet the requirements of 6.1.1, the Contractor shall within ten Days thereafter substitute another bond and surety, both of which must be acceptable to the Town.

6.2 Licensed Sureties and Insurers; Certificates of Insurance

6.2.1 All Bonds and insurance required by the Contract Documents to be purchased and maintained by the Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the State of Florida to issue Bonds or insurance policies for the limits and coverages so required. All Bonds signed by an agent must be accompanied by a certified copy of authority to act. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

6.2.2 The Contractor shall deliver to the Town, with copies to each additional insured identified in 6.3.1, an original or a certified copy of the complete insurance policy for each policy required, certificates of insurance (and other evidence of insurance requested by the Town or any other additional insured) which the Contractor is required to purchase and maintain in accordance with 6.3.1.

6.3 Contractor's Liability Insurance

6.3.1 The Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and furnished and will provide protection from claims set forth below which may arise out of or result from Contractor's performance and furnishing of the Work and the Contractor's other obligations under the Contract Documents, whether it is to be performed or furnished by the Contractor, any Subcontractor or supplier, or by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for those acts any of them may be liable. The Contractor shall purchase and maintain in force during the contract period with an insurer licensed to do business in the State of Florida; rated AAA or better by A.M. Best Rating Company for Class VII financial size category, and acceptable to the Town the following insurances. The limits of liability for the insurance shall provide coverage for not less than the following amounts or greater where required by applicable Laws and Regulations.

a. Workers Applicable Compensation Insurance providing statutory benefits, including those that may be required by any applicable federal statute:

Admitted in Florida	Yes
Employer's Liability	\$100,000
All States Endorsement	Statutory
USL & H Endorsement	Statutory
Voluntary Compensation	Statutory

b. Commercial General Liability Insurance, including Town and Contractor Protective, Contractual, Products and Completed Operations Liability coverage on an occurrence policy form in limits not less than those listed and deductible amounts not to exceed \$25,000.

Aggregate Combined:	\$1,000,000
Each Occurrence:	\$500,000
M&C/CGL	\$1,000,000
Broad Form CGL	\$500,000
Contractual Liability	\$500,000
Products	\$1,000,000
Completed Operation	\$1,000,000
Personal Injury	\$500,000
Independent Contractors	\$500,000
XCU Property Damage Excel	\$500,000
Umbrella Liability	\$1,000,000

Regarding Completion Operations Liability: Continue coverage in force for three (3) years after Town's acceptance of the project.

c. Automobile Liability Insurance. Coverage shall be maintained by the Contractor as to the ownership, maintenance, and use of all of its owned, non-owned, leased or hired vehicles with limits of not less than:

Bodily injury & Property Damage Liability	\$500,000
Combined Single Limit Each Accident	\$500,000

These policies will provide that:

1) The insurer(s) waive their rights of subrogation against the Town, their officials, employees, agents and consultants.

2) The Town shall be named as an additional insured on all Policies required by the Contract Documents. The Certificate of Insurance must state the Bid No. 14-002 and the Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls. A Thirty (30) Day prior written notice of cancellation or material alteration is required. Renewal notices to be sent to the Finance Department.

3) The Contractor shall not be given Notice to Proceed under the Contract until he has obtained all the insurance required by the Contract Documents and submitted all certificates of insurance and proofs of insurance as required by the Contract Documents and all such materials had been delivered to and have been approved by the Town. The insurance certificates shall be given to:

Finance Department
Attention: Traci Moore
501 Bay Isles Road
Longboat Key, Florida 34228

The acceptable form of the certificate of insurance shall be the industry standard ACORD certificate.

6.3.2 Notwithstanding any other provision of these Contract Documents to the contrary, the Contractor shall not provide Builder's Risk or Architects and Engineers Professional Liability Insurance unless specially requested by the Town. The Town has Builder's Risk coverage and will provide the Contractor with appropriate Certificate of Insurance upon request. The Town's Builder's Risk policy does not insure the Contractor's tools, machinery or equipment that is stored at the job site. If the Contractor is required to store tools, machinery or equipment at the job site, the Contractor should provide insurance in the form of an equipment floater for Contractor's tools and equipment. The Town should be named as an additional insured on the Contractor's policy; with an appropriate waiver of subrogation as to any claims the Contractor or the Contractor's insurer may have against the Town arising from the storage of Contractor's tools and equipment.

6.3.3 The Contractor shall not allow a Subcontractor to work on the Project or be present on the Project Area without either Subcontractor carrying his own Workers Compensation and Liability insurance or the Contractor covering the Subcontractor under his policies. The policy is the same for each succeeding sub-tier Contractor. The Town may request proof of such coverage for any Subcontractor at any time during the performance of the Work.

6.3.4 Any additional insurance, if required, will be as specified in any Supplementary Conditions.

6.4 Receipt and Application of Insurance Proceeds

6.4.1 Any insured loss under the policies of insurance required by the Contract Documents will be adjusted with the Town and made payable to the Town as fiduciary for the insured as their interest may appear. The Town shall account for all money received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and cost thereof covered by an appropriate Change Order or written Amendment as determined by the Town.

6.5 Indemnification

6.5.1 The Contractor does hereby indemnify and hold harmless the Town, its officers and employees, from liabilities, damages, losses and costs, including but not limited to, reasonable attorneys fees, to the extent caused by the negligence, recklessness or intentional wrongful misconduct of the Contractor and persons or entities employed or utilized by the Contractor in the performance of the Work. The monetary limitation to the extent of this indemnification is \$1,750,000. The parties acknowledge and agree that at the time this Contract was prepared for inclusion in the Bid Documents for the Work, being prior to the time that bids were solicited and received, there was no way for the Town to know the precise amount of the Contract Sum, and the parties hereto expressly acknowledge and agree that the monetary limitation on the extent of the indemnification provided herein bears a reasonable commercial relationship to this Contract and the Work to be performed pursuant to the Contract and the Contract Documents.

6.5.2 In any and all claims against the Town or any of its agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under the previous paragraph shall not be limited in any way as to the amount or type of damages, compensation or benefits payable by or

for the Contractor or any Subcontractor under Workmen's compensation acts, disability benefit acts, or other employee benefit acts.

6.5.3 The Contractor shall and does hereby indemnify and hold harmless the Town and anyone directly or indirectly employed by it from and against all claims, suits, demands, damages, losses, and expenses (including attorney's fees) arising out of any infringement of patent or copyrights held by others and shall defend all such claims in connection with any alleged infringement of such rights.

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

7.1 Supervision and Superintendence

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

7.1.2 The Contractor shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to the Town, through the Professional, except under extraordinary circumstances. The superintendent will be the Contractor's representative at the site and shall have authority to act on behalf of the Contractor. All communications to the superintendent shall be as binding as if given to the Contractor. The Town reserves the right to require the Contractor to remove and replace the superintendent of this Project within 15 Days of notice.

7.2 Labor, Materials, and Equipment

7.2.1 The Contractor shall provide and pay for competent, suitable, qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The Contractor shall at all times maintain good discipline and order on the site.

7.2.2 The Contractor shall furnish and pay for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, and sanitary facilities, and all other facilities and incidentals whether temporary or permanent necessary for the execution, testing, initial operation, and completion of the Work as required by the Contract Documents. Town will supply potable water to the Contractor for the execution, testing, initial operation, and completion of the Work.

7.2.3 All materials and equipment shall be new and of good quality, except as otherwise provided in the Contract Documents. If required by the Professional, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

7.2.4 All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, or processors, except as otherwise provided in the Contract Documents.

7.3 Substitute Materials or Equipment

7.3.1 If the Contractor wishes to furnish or use a proposed substitute after the award of the Contract, it shall within thirty (30) Days after Notice to Proceed make written application to the Professional and Project Manager for consideration of such substitute, certifying in writing that the proposed substitute will perform adequately the duties imposed by the general design, be similar and of equal substance or quality to that specified, and be suited to the same use and capable of performing the same function as that specified. No substitute shall be ordered or installed without the prior written approval of the Professional. The application shall also contain an itemized estimate of all costs that may result directly or indirectly from acceptance of such substitute, including costs of redesign, delays, maintenance, and

claims of other Contractors affected by the resulting change, all of which shall be considered by the Project Manager and Professional in evaluating the proposed substitute. Approval of any change in costs or schedule as a result of acceptance of the substitute by the Professional shall be by Change Order.

7.3.2 This paragraph applies to any cost reduction proposal (hereinafter referred to as a Value Engineering Change Proposal or VECPs) initiated and developed by the awarded Contractor during the construction process for the purpose of refining the Contract Documents so as to contribute to design cost effectiveness or significantly improve the quality of the end result. VECPs must result in savings without impairing essential functions and characteristics such as safety, service, life, reliability, economy of operation, ease of maintenance, aesthetics and necessary standard design features. The awarded Contractor must state that he is submitting a VECF proposal. The VECF shall be submitted to the Town through the Professional. The Town reserves the right to reject at its discretion any VECF submittal. As a minimum, the following information shall be submitted by the awarded Contractor with each VECF:

- 1) A description of the difference between the existing Contract requirement and the proposed change, and the comparative advantages and disadvantages;
- 2) Separate detailed cost estimates for both the existing Contract requirement and the proposed change.

7.4 Subcontractors

7.4.1 The Contractor shall be fully responsible for all acts and omissions of its Subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent as if they were employed by the Contractor. Nothing in the Contract Documents shall create any contractual relationship between any Subcontractor and the Town or any obligation on the part of the Town to pay or to see to the payment of any monies due any Subcontractor, except as may otherwise be required by law. The Town may furnish to any Subcontractor, to the extent practicable, evidence of amounts paid to the Contractor for specific Work done.

7.4.2 The Contractor shall identify and provide information on Subcontractors, Suppliers and other persons or organizations, which shall be used by the Contractor in accordance with requirements of the Contract Documents.

7.4.3 The divisions and sections of the Technical Specifications, and the identifications of any Drawings, shall not control the Contractor in dividing Work among Subcontractor or delineating the Work to be performed by any specific trade.

7.4.4 The Contractor agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Contract Documents, including but not limited to the General Conditions (specifically, but without limitation all indemnity provisions in favor of the Town) and any Supplemental Conditions, for the benefit of the Town.

7.4.5 All Work performed for the Contractor by a Subcontractor shall be pursuant to an appropriate written subcontract between the Contractor and the Subcontractor which shall contain provisions that waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by insurance, except such rights as they may have to the proceeds of such insurance held by the Town as trustee. The Contractor shall pay each Subcontractor an appropriate amount, determined by value of the Work, of any insurance monies received by the Contractor under this insurance.

7.5 Patent Fees and Royalties

7.5.1 The Contractor shall pay all license fees and royalties and assume all costs incident to the use of any invention, design, process, or device which is the subject of patent rights or copyrights held by others. The Contractor shall and does hereby indemnify and hold harmless the Town and its employees and agents from and against all claims, costs, losses and damages arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device not specified in the Contract Documents.

7.6 Permits

7.6.1 All Permits and licenses necessary for the prosecution of the Work shall be procured and paid for by Contractor, except to the extent that any permits are issued and acquired by the Town as provided in Specification 01002 prior to the entry into a Contract for the Work to be performed pursuant to the Contract Documents. Permit fees payable to the Town Planning, Zoning, and Building Department for the building, electrical, and plumbing permits will be paid by the Town Public Works Department. Contractor shall notify the Public Works Department of the final permit fee at least two weeks prior to fee due date.

If Contractor performs any Work without obtaining, or contrary to, such Permits or licenses, Contractor shall bear all costs arising there from. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work.

7.6.2 Permits required for the Work - paid for and obtained by the Town are referenced in the Technical Specifications.

7.6.3 Contractor shall pay all sales, consumer, use and other similar taxes associated with the Work or portions thereof, which are applicable during the performance of the Work.

7.6.4 The permits obtained by the Town apply only to the Work to be performed pursuant to the Contract and the Contract Documents.

7.7 Laws and Regulations

7.7.1 The Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations applicable to the Work. If the Contractor observes that any of the Contract Documents are contradictory to such laws, rules, and regulations, it will notify the Professional promptly in writing. Any necessary changes shall then be adjusted by an appropriate Change Order. If the Contractor performs any Work that it knows or should have known to be contrary to such laws, ordinances, rules, and regulations and without such notice to the Professional, it shall bear all related costs.

7.8 Taxes

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

7.9 Use of Premises

7.9.1 The Contractor shall confine its equipment, the storage of materials and equipment, and the operations of its Workers to the areas permitted by law, ordinances, Permits, or the requirements of the Contract Documents. The Contractor shall not unreasonably encumber the site with materials and equipment. Any loss or damage to the Contractor's or any Subcontractor's equipment is solely at the risk of the Contractor.

7.9.2 During the progress of the Work, the Contractor shall keep the premises free from accumulations of waste materials, rubbish and other debris or contaminates resulting from the Work. At the completion of the Work, Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials. The Contractor shall leave the site clean and ready for occupancy by the Town at Substantial Completion of the Work. The Contractor shall restore to original condition all property so designated for alteration by the Contract Documents.

7.9.3 The Contractor shall not load or permit any part of any structure to be loaded in any manner that will endanger the structure. The Contractor shall not subject any part of the Work or adjacent property to stresses or pressures that will endanger them.

7.10 Record Documents

7.10.1 The Contractor shall keep at the Project Area and in good order one record copy of the Contract Documents and all Drawings and Specifications. These documents shall be annotated on a continuing basis to show all changes made during the construction process. These shall be available to the Professional and the Project Manager and shall be submitted with the Application for Final Payment.

7.11 Safety and Protection

7.11.1 The Contractor shall take all necessary precautions for the safety of and will provide the necessary protection to prevent damage, injury, or loss to:

7.11.1.2 All employees on the Work and other persons who may be affected by it.

7.11.1.3 All the Work and all materials or equipment to be incorporated, whether in storage on or off the site. The Contractor shall assume all risk of loss for stored equipment or materials, irrespective of whether the Contractor has transferred the title of the stored equipment or materials to the Town.

7.11.1.4 Other property at the site or adjacent to it, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

7.11.2 The Contractor is responsible for observing all Occupational Safety and Health Administration (OSHA) regulations and shall self inspect to ensure this is accomplished. Including, but not limited to, those specified in the Technical Specifications. The Contractor shall ensure that all personnel are properly trained and shall be able to provide documentation for their personnel that have attended training courses. Examples of such training courses are, without limitation: Hazard Communications, Traffic Work Zone Safety, Personal Protective Equipment, First Aid/CPR, Permit Required Confined Space, Lock out/Tag out of hazardous energy.

7.11.3 A Town representative may periodically monitor Work site safety. Should there be safety and/or health violations, classified as Serious, Willful, or Criminal/Willful Violations, the Town's representative has the authority, but not the duty, to report to OSHA and require the Contractor to correct the violation in an expeditious manner. Neither the Town nor its representative shall have or assume any responsibility or duty whatsoever with respect to OSHA compliance for any work being performed, and the Contractor shall have the sole and exclusive duty and responsibility for compliance with all OSHA and other safety requirements with respect to the Work and the performance of the Work.

7.11.4 Should the Work site be in a hazardous area, the Town may furnish the Contractor with information concerning hazards such as types or identification of known toxic material, machine hazards, Material Safety Data Sheets, or any other information that would assist the Contractor in the planning of a safe Work site.

7.11.5 The Contractor shall be aware that while performing any Work pursuant to the Contract Documents, representatives from agencies such as the United States Department of Labor, OSHA, and the Division of Safety, State of Florida, are invitees and need not have warrants or permission to enter the Work site. These agencies, along with any authorized representative of the Town shall enter the Work site at the pleasure of the Town.

7.11.6 The Contractor shall designate a competent person of its organization whose duty shall be the prevention of accidents at the site. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the Professional. All communications to the superintendent shall be as binding as if given to the Contractor. This provision shall not be deemed to in any way limit

or define the obligations of Contractor as established by OSHA and/or other applicable rules and regulations.

7.11.7 Should there be catastrophic injuries, as defined by OSHA, or a fatality on the Worksite, the Project Manager shall be notified immediately.

7.11.8 Should the Town or Professional, require the OSHA 200 Log, or written safety and health plan & training documents, those documents shall be at his office within 24 hours of the request. Failure to provide the documentation within that time frame may cause the Project to be shut down, at no expense to the Town, until such documents are received.

7.12 Emergencies

7.12.1 In emergencies affecting the safety of persons, the Work or property at the site or adjacent thereto, the Contractor, without special instructions or authorization from the Professional if time or circumstances do not permit, is obligated to prevent or mitigate threatened damage, injury, or loss. The Contractor shall give the Professional written notice that the emergency provision has been invoked and shall state the reasons therefore within twenty-four (24) hours of the incident. If the Contractor believes the emergency results in additional Work, a claim for a Change Order may be submitted in accordance with the procedures set forth herein.

7.12.1.1 The Contractor shall immediately notify the Professional of all events involving personal injuries to any person on the Site, whether or not such person was engaged in the construction of the Project, and shall file a written report on such person(s) and any other event resulting in property damage of any amount within five (5) Days of the occurrence.

7.12.1.2 If the Professional determines that a change in the Contract Documents is required because of the action taken by the Contractor in response to such an emergency, a Change Order will be issued to document the consequences of such action.

7.13 Submittal and Samples

7.13.1 After checking and verifying all field measurements, the Contractor shall promptly submit to the Professional for approval, in accordance with the accepted schedule of submittal, all submittal and samples required by the Contract Documents. All submittal and samples shall have been checked by and stamped with the approval of the Contractor and identified as the Professional may require. The data shown on or with the submittal will be complete with respect to dimensions, design criteria, materials and any other information necessary to enable the Professional to review the submittal as required. At the time of each submission, the Contractor shall give notice to the Professional of all deviations that the submittal or sample may have from the requirements of the Contract Documents.

7.13.1.1 The Professional shall review and approve submittal and samples. The Professional's review and approval shall be only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. The approval of a separate item as such will not indicate approval of the assembly in which the item functions. The Contractor will make any corrections required by the Professional and resubmit the required number of corrected copies until approved. The Contractor's stamp of approval on any submittal or sample shall constitute its representation to the Professional and the Town that the Contractor has determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, and that each submittal or sample has been reviewed or coordinated with the requirements of the Work and the Contract Documents.

7.13.1.2 No Work requiring a submittal or sample submission shall commence until the submission has been approved by the Professional. A copy of each approved submittal and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Professional and the Town staff. Any delays associated with the submittal process will be considered for time extensions only, and no damages or additional compensation for delay will be allowed.

7.13.1.3 The Professional's approval of submittal or samples shall not relieve the Contractor from responsibility for any variation from the requirements of the Contract Documents unless the Contractor has in writing called the Professional's attention to each such variation at the time of submission and the Project Manager has given written approval to the specific deviation; any such approval by the Professional shall not relieve the Contractor from responsibility for errors or omissions in the submittal.

7.13.1.4 Where a shop drawing or sample is required by the Contract Documents or the schedule of shop Drawings and sample submissions accepted by the Professional as required, any related Work performed prior to Professional's review and approval of the pertinent submittal will be at the sole expense and responsibility of the Contractor.

ARTICLE 8 - OTHER WORK

8.1 The Town may perform additional Work related to the Project with its own forces or may let other direct contracts. The Contractor shall provide the other contractors who are parties to such direct contracts, including but not limited to the other contractor's employees, agents, Subcontractors, and suppliers (or the Town's forces performing the additional Work), reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work, and shall properly connect and coordinate its Work with theirs. The 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. The Contractor shall not endanger any Work of others by cutting, excavating or otherwise altering their Work and will only cut or alter their Work with the written consent of the Professional and the others whose Work will be affected. Contractor is not entitled to exclusive use of the Site.

8.1.1 If any part of the Contractor's Work depends (for proper execution or results) upon the Work of any such other contractor (or the Town), the Contractor will inspect and promptly report to the Professional in writing any defects or deficiencies in such Work that render it unsuitable for such proper execution and results. The Contractor's failure to report shall constitute an acceptance of the other Work, except as to defects and deficiencies, which may appear in the other Work after the execution of its Work.

ARTICLE 9 – TOWN'S RESPONSIBILITIES

9.1 Except as otherwise provided in these General Conditions, the Town shall issue all communications to the Contractor through the Professional.

9.1.1 The Town shall furnish the data required under the Contract Documents and shall make payments to the Contractor when due as provided in Article 15.

9.1.2 The Town's responsibilities for providing lands, easements, and engineering surveys to establish reference points are set forth in Article 5.

ARTICLE 10 - PROFESSIONAL'S STATUS DURING CONSTRUCTION

10.1 Town's Representative

10.1.1 The Professional shall be a representative of the Town during the construction period. The duties, responsibilities, and limitations of authority of the Professional as the Town's representative during construction are set forth in these General Conditions and the Technical Specifications.

10.2 Visits to the Site

10.2.1 The Professional shall make periodic visits to the site to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents.

10.3 Clarifications and Interpretations

10.3.1 The Professional shall issue such written clarifications or interpretations of the Contract Documents (in the form of Drawings or otherwise) as may be determined necessary, or as reasonably requested by the Contractor, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If the Contractor believes that a written clarification and interpretation entitles it to an increase in the Contract Sum, and/or Contract Time, the Contractor may make a claim as provided for in Articles 11, 12, and 13.

10.4 Rejecting Defective Work

10.4.1 The Professional has the authority to disapprove or reject Work, which is Defective. The Professional also has authority to require special inspection or testing of the Work at the Contractor's expense, as provided in Article 14, whether or not the Work is fabricated, installed, or completed.

10.5 Resident Engineer or Architect

10.5.1 The Professional may furnish a full or part-time Resident Engineer or Architect and other personnel to assist them in carrying out services at the site. The duties, responsibilities, and limitations of authority of any such Resident Engineer or Architect and other personnel are set forth in the Supplemental Conditions, if applicable.

10.6 Decisions on Disagreements

10.6.1 The Professional shall interpret the requirements of the Contract Documents and determine the acceptability of the Work. If the Contractor disagrees with the Professional's opinion, the Contractor shall refer claims, disputes, and other matters relating to the acceptability of the Work or their interpretation of the requirements of the Contract Documents initially to the Professional in writing with a request for a formal decision. The Professional will render in writing its opinion concerning the Contractor's request for a formal decision and shall submit it to the Project Manager. After receipt of the Professional's written opinion and all information requested from the Contractor, the Project Manager shall render a formal decision in writing, which shall then be conveyed to the Contractor by the Professional. Written notice of each such claim, dispute, and other matter shall be delivered by the Contractor to the Professional within seven (7) calendar Days of the occurrence first happening. Written supporting data will be submitted to the Professional within fifteen (15) calendar Days after such occurrence unless the Professional allows additional time. If the Contractor fails to strictly comply with these notices and submittal time periods, the Contractor shall be deemed to have waived its right to assert a claim the Contractor might otherwise have had concerning such matter.

10.7 Limitation on Professional's Responsibilities

10.7.1 Neither the Professional's authority to act under this Article or elsewhere in the Contract Documents, nor any decision made in good faith to exercise such authority shall give rise to any duty or responsibility of the Professional to the Contractor, any Subcontractor, any of their agents or employees.

10.7.1.1 The Professional shall not be responsible for the construction means, methods, techniques, sequences, or procedures or the safety precautions and programs used. The Professional shall not be responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents.

10.7.1.2 The Professional shall not be responsible for the acts or omissions of the Contractor, any Subcontractors, any agents or employees, or any other persons performing any of the Work.

ARTICLE 11 - CHANGES IN THE WORK

11.1 Changes

11.1.1 Without invalidating the Contract, the Town may at any time or from time to time order additions, deletions, or revisions in the Work. The Professional shall provide the Contractor with a Proposal

Request, identifying the Work to be added, deleted or revised. Upon receipt, the Contractor shall promptly submit a written proposal for the changed Work prepared in accordance with Articles 12 and 13. If the Proposal Request calls only for the deletion of Work, the Professional may order the partial suspension of any Work related to the proposed deletion, in which case the Contractor must cease performance as directed; the Contractor shall not be entitled to claim lost profits on deleted Work. All changed Work shall be executed under the applicable conditions of the Contract Documents.

11.1.2 Additional Work performed by the Contractor without authorization of a Change Order will not entitle the Contractor to an increase in the Contract Sum or an extension of the Contract Time, except in the case of an emergency as provided in Article 7.12 The effect of this paragraph shall remain paramount and shall prevail irrespective of any conflicting provisions contained in these Contract Documents.

11.1.3 Upon Contract as to changes in the Work to be performed, Work performed in an emergency as provided in Article 7, and any other claim of the Contractor for a change in the Contract Time or the Contract Sum, the Professional will prepare a written Change Order to be signed by the Professional and the Contractor and submitted to the Town for approval.

11.1.4 It is the Contractor's responsibility to notify its Surety of any changes affecting the general scope of the Work, Contract Sum, or Contract Time.

11.1.5 In the absence of a Change Order as provided in 11.1.3, the Town or Professional at the direction of the Town may; at its sole discretion issue a Construction Change Directive to the Contractor. Pricing of the Construction Change Directive will be in accordance with Article 12.

11.1.6 The Construction Change Directive will specify a price, and if applicable a time extension, determined to be reasonable by the Town. If the Contractor fails to sign such Construction Change Directive, the Contractor may submit a claim in accordance with Articles 11, 12, and 13, but the Contractor shall nevertheless be obligated to fully perform the Work as directed by the Construction Change Directive.

11.1.7 The Contractor shall proceed diligently with performance of the Work as directed by the Town, regardless of pending claim actions, unless otherwise agreed to in writing.

ARTICLE 12 - CHANGE OF CONTRACT SUM

12.1 The Contract Sum

12.1.1 The Contract Sum constitutes the total compensation (subject to written authorized adjustments) payable to the Contractor for performing the Work based upon an extension of the units and unit prices as shown on Contractor's Submitted Bid. All duties, responsibilities and obligations assigned to or undertaken by Contractor to perform the Work shall be at the Contractor's expense without change in the Contract Sum.

12.1.2 The Contract Sum may only be increased or decreased by a written Change Order or Construction Change Directive. Any claim for an increase shall be in writing and delivered to the Professional within seven (7) calendar Days of the occurrence first happening. Written supporting data will be submitted to the Professional within fifteen (15) calendar Days after such occurrence unless the Town allows additional time.

12.1.3. The value of any Work covered by a Change Order or of any claim for an adjustment in the Contract Sum will be determined by the following procedures:

12.1.3.1 Designated Unit Price (Field Measure). The Contractor and the Town recognize and acknowledge that the quantities shown for those items designated in the Contractor's Submitted Bid as unit price items are approximations prepared by the Town for bid purposes and that the actual compensation payable to the Contractor shall be based upon the application of unit prices to the actual quantities of items involved as measured in the field and required to complete the Work as originally defined in the Contract Documents.

When it is determined by the Town that an addition, deletion, or revision to the Work as defined in these Contract Documents is required and affects the quantities required for items designed in the Submitted Bid as unit price items, the Contractor and the Town agree that the compensation payable to the Contractor for such unit price items shall be adjusted accordingly by a Change Order based upon the application of the appropriate unit prices shown in the Submitted Bid to the quantity of the unit price item required to complete the Work as defined in the Contract Documents.

12.1.3.2 Other Unit Prices: For items not designated in the Submitted Bid as unit prices, the Town and the Contractor may establish unit prices as agreed on by Change Order.

12.1.3.3 Lump Sum: When it is determined by the Town that an addition, deletion or revision to the Work is required which results in a change in Work designated in the Bid Proposal as a lump sum item, the amount of increase or decrease in the lump sum price shall be established by mutual agreement of the parties.

12.1.4 If the pricing methods specified in 12.1.3 are inapplicable, or if the parties are unable to agree on a price for the changed Work, a reasonable price for the same shall be established by the Town in accordance with 12.2. The Town shall then process a unilateral Change Order, specifying the said reasonable price. The Contractor shall perform the Work as directed in the Change Order.

12.1.5 Failure on the part of the Contractor to construct any item to plan or authorized dimensions within the specification tolerances shall result in: reconstruction to acceptable tolerances at no additional costs to the Town; acceptance at no pay; or acceptance at reduced final pay quantity or reduced unit price, all at the discretion of the Town. Determinations of aggregate monetary change for items identified, as lump sum quantities shall be made by the Town based upon an analysis of the scope of the Contractor's failure to construct to plan or authorized dimensions.

12.2 Cost of Work

12.2.1 The term, Cost of Work, for the purpose of Change Orders, or Construction Change Directive means the costs necessarily incurred and paid by the Contractor in the proper performance of the Change Order Work. Except as may be agreed to in writing by the Professional, such costs shall be in amounts no higher than those prevailing in the area of the Work and may include the following categories:

- 12.2.1.1 Labor (payroll, taxes, fringe benefits, Worker's compensation, health and retirement benefits, sick leave):
- 12.2.1.2 Owned Equipment (at lowest applicable equipment rate manual rate)
- 12.2.1.3 Rented Equipment (at actual rental rate)
- 12.2.1.4 Materials
- 12.2.1.5 Supplies
- 12.2.1.6 Subcontractors Costs
- 12.2.1.7 Bonds and Insurance
- 12.2.1.8 Contractor's Fee (per 12.3)

12.2.2 The Contractor shall require all Subcontractors and suppliers to comply with all requirements of, and provide itemizations of all claims in accordance with this Article.

12.2.3 The term Cost of the Work shall not include any of the following:

12.2.3.1 Payroll costs and other compensation of the Contractor's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, lawyers, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by the Contractor whether at the site or in its principal or a branch office for general administration of the Change Order Work and not specifically included in the agreed upon schedule of job classifications, all of which are to be considered administrative costs covered by the Contractor's fee.

12.2.3.2 Extraordinary fringe benefits not specifically identified in Article 12.2.1.1.

12.2.3.3 Expenses of Contractor's principal and branch offices other than the Contractor's office at the site.

12.2.3.4 Any part of the Contractor's capital expenses, including interest on the Contractor's capital used for the Change Order Work and charges against the Contractor for delinquent payments.

12.2.3.5 Cost of premiums for all Bonds and insurance whether or not the Contractor is required by the Contract Documents to purchase and maintain the same (except for additional Bonds and insurance required because of changes in the Work).

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

12.2.3.7 Overhead or general expense costs of any kind (other than as provided in 12.3).

12.3 Contractor's Fee

12.3.1 The maximum percentage allowed for the Contractor's combined overhead and profit shall be as follows:

12.3.1.1 For all such Change Order Work or Construction Change Directive done a fixed percentage of the total adjustment to the Contract Sum shall be negotiated and shall not exceed ten (10) percent.

12.3.2 For all changes, the Contractor shall submit an itemized cost breakdown, together with supporting data in such detail and form as prescribed by the Professional. When a credit is due, the amount of credit to be allowed by the Contractor to the Town for any such change which results in a net decrease in cost will be the amount of the actual net decrease in direct cost as determined by the Professional, plus the applicable reduction in overhead and profit. When both additions and credits are involved in any change, the combined overhead and profit shall be calculated on the basis of the net change, whether an increase or decrease. In any event, the minimum detail shall be an itemization of all man-hours required by discipline/trade with the unit cost per man-hour and total labor price, labor burden, equipment hours and rate for each piece of equipment, material by units of measure and price per unit, other costs specifically itemized, plus the overhead and profit markup.

ARTICLE 13 - CHANGE OF CONTRACT TIME

13.1 Any change to the Contract Time will only be authorized by a written Change Order. Any request for an extension in the Contract Time shall be made in writing and delivered to the Professional within seven (7) calendar Days of the occurrence first happening and resulting in the claim. Written supporting data will be submitted to the Project Manager within fifteen (15) calendar Days after such occurrence unless the Professional allows additional time. All claims submitted by the Contractor for adjustments to the Contract Time must set forth in detail the reasons for and causes of the delay and clearly indicate why the subject delay was beyond the Contractor's control or fault.

13.1.1 If the Contractor is delayed at any time in the performance, progress, commencement, or completion of the Work by any act or neglect of or by the Town or the Professional, or by an employee of either, or by any separate contractor employed by the Town, or by changes ordered in the Work, or by labor disputes, fire, unavoidable casualties, utility conflicts which could not have been identified or foreseen by the Contractor using reasonable diligence, or any causes beyond the Contractor's control or fault, then the Contract Time shall be extended by Change Order for such reasonable time as the Town may determine. The Contractor shall be entitled to an extension of time for such causes only for the number of Days of delay which the Town may determine to be due solely to such causes and only to the extent such occurrences actually delay the completion of the Work and then only if the Contractor shall have strictly complied with all the requirements of the Contract Documents. Provided, however, notwithstanding anything in the Contract Documents to the contrary, no interruption, interference,

inefficiency, suspension or delay in the performance, progress, commencement or completion of the Work for any cause whatsoever, including those for which the Town or the Professional 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 the Town. The Contractor's sole and exclusive remedy against the Town for interruption, interference, inefficiency, suspension or delay of any aspect of the Work shall be the right to seek an extension to the Contract Time in accordance with the procedures set forth herein.

ARTICLE 14 - WARRANTY AND GUARANTEE: ACCEPTANCE OF DEFECTIVE WORK

14.1 Warranty and Guarantee

14.1.1 The Contractor warrants and guarantees to the Town that all materials and equipment will be new unless otherwise specified, and that all Work will be of good quality, performed in a workmanlike manner, free from faults or defects, and in accordance with the requirements of the Contract Documents and any inspections, tests, or approvals referred to in this Article and other applicable provisions of the Contract Documents. All unsatisfactory Work, all faulty Work and all Work not conforming to the requirements of the Contract Documents or such inspections, tests, approvals, or all applicable building, construction and safety requirements shall be considered Defective. Notice of all defects or Defective Work, will be given to the Contractor in writing by the Project Manager and/or Professional. All Defective Work, whether or not in place, may be rejected, corrected, or accepted as provided in this Article.

14.1.2 If, after approval of final payment and prior to the expiration of one year after the date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any Work or materials are found to be Defective, incomplete, or otherwise not in accordance with the Contract Documents, the Contractor shall promptly, without cost to the Town and in accordance with the Town's written instructions, either correct such Defective Work, or if it has been rejected by the Town, remove it from the Site and replace it with non-Defective Work. If the Contractor does not promptly comply with the terms of such instructions, the Town may have the Defective Work corrected, removed, or replaced. All costs (direct or indirect) for Defective Work will be paid by the Contractor.

14.2 Tests and Inspections

14.2.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to specifically be inspected, tested, or approved by someone other than the Contractor, the Contractor shall give the Professional timely notice of readiness therefore. The testing firm(s), (if assigned by the Town to this Work), and all such inspections, tests, or approvals provided for by the Town shall be identified in writing by the Professional to the Contractor. All other inspections, tests or approvals shall be at the Contractor's expense including additional expenses for inspection and tests required as a result of delays by the Contractor or hours Worked in excess of 40 hours per week. For all required inspections, tests, and approvals on any Work prepared, performed, or assembled away from the site, the Contractor will furnish the Professional with the required Certificates of Inspection, testing, or approval. All such tests will be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organizations as may be required by law or the Contract Documents. Materials or Work in place that fail to pass acceptability tests shall be retested at the direction of the Professional and at the Contractor's expense.

14.2.2 Neither observations by the Professional or Project Manager nor inspections, tests, or approvals by persons other than the Contractor shall relieve the Contractor of its obligations to perform the Work in accordance with the requirements of the Contract Documents.

14.3 Access to the Work

14.3.1 For the duration of the performance of the Work, the Professional and its representatives, other designated representatives of the Town, and authorized representatives of any regulatory agency shall at

all time be given access to the Work. The Contractor shall provide proper facilities for such access and observation of the Work and also for any inspection or testing by others.

14.4 Uncovering the Work

14.4.1 If any Work required to be inspected, tested or approved is covered prior thereto without the prior written approval of the Professional, or if any Work is covered contrary to the request of the Project Manager, the Work shall, if requested by the Professional, be uncovered for observation, inspection, testing or approval and replaced at the Contractor's expense.

14.4.2 If any Work has been covered which either the Professional or the Project Manager has not specifically requested to observe, or if the Professional or the Project Manager considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, upon written request of the Professional, shall uncover, expose, or otherwise make available for observation, inspection, or testing that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is Defective, the Contractor shall bear the expense of such uncovering, exposure, observation, inspection, testing, and satisfactory reconstruction. If, however, such Work is not found to be Defective, the Contractor shall be allowed an increase in the Contract Sum or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction, if it makes a claim as provided in Articles 11, 12 and 13.

14.5 Stop Work

14.5.1 When Work is Defective or when the Contractor fails to supply sufficient skilled Workmen or suitable materials or equipment, or make prompt payments to Subcontractors for labor, materials, or equipment, or if the Contractor violates any provisions of these Contract Documents, the Town may order the Contractor to stop the Work until the cause for such order has been eliminated. However, this right of the Town to stop the Work shall not give rise to any duty on the part of the Town to exercise this right for the benefit of the Contractor or any other party. The Contractor shall have no right to claim an increase in the Contract Sum or Contract Time or other damages for a stop Work order under this paragraph.

14.6 Correction or Removal of Defective Work

14.6.1 When directed by the Professional, the Contractor shall promptly, without cost to the Town, and as specified by the Professional, either correct the Defective Work, whether fabricated, installed, or completed, or remove it from the site and replace it with non-Defective Work. If the Contractor does not correct such Defective Work or remove and replace such Defective Work within a reasonable time, all as specified in a written notice from the Professional, the Town may have the deficiency corrected. All direct and indirect costs of such correction shall be paid by the Contractor or deducted from payment to Contractor. The Contractor will also bear the expense of correcting or removing and replacing all Work of others destroyed or damaged by the correction, removal, or replacement of the Defective Work.

14.7 Acceptance of Defective Work

14.7.1 If, instead of requiring correction or removal and replacement of Defective Work, the Town prefers to accept it, the Town may do so. In such case, if acceptance occurs prior to approval of final payment, a Change Order incorporating the necessary revisions in the Contract Documents, including an appropriate reduction in the Contract Sum, shall be issued. If the acceptance occurs after approval of final payment, the Contractor shall pay within 60 days to the Town an appropriate sum to compensate for the defect in the Work.

14.8 Neglected Work by Contractor

14.8.1 If the Contractor neglects to execute the Work in accordance with the Contract Documents, including any requirements of the progress schedule, the Professional may direct the Contractor to submit a recovery plan and take specific corrective actions including, but not limited to, employing additional workmen, and/or equipment, and Working extended hours and additional Days, all at no cost to the Town in order to put the Work back on schedule. If the Contractor fails to correct the deficiency or take

appropriate corrective action, the Town may terminate the contract or Contractor's right to proceed with that portion of Work and have the Work done by others. The cost of completion under such procedure shall be charged against the Contractor. A Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including an appropriate reduction in the Contract Sum. If the payments due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Town within 60 days.

14.8.2 Should the Contractor Work overtime, weekends or holidays to regain the schedule, all costs to the Town of associated inspection, construction management and resident engineering shall be identified to the Contractor and the Contract Sum reduced by a like amount via Change Order.

ARTICLE 15 - PAYMENT AND COMPLETION

15.1 Schedule of Values

15.1.1 The schedule of values established as provided in 3.5.5 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to the Professional and the Project Manager. Progress payments on account of Unit Price Work will be based on the number of units completed. The provisions of the Technical Specifications shall apply to all payments and Applications For Payment.

15.2 Application for Progress Payment

15.2.1 At least twenty (20) calendar Days before the date established for each progress payment (but not more often than once a month), Contractor shall submit to the Professional for review an Application for Payment filled out and signed by the Contractor covering the Work completed as of the date of the Application For Payment and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that Town has received the materials and equipment free and clear of all liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect Town's interest therein, all of which will be satisfactory to Town. Payment is subject to a ten percent (10%) retainage that will be held until the final payment or acceptance by the Town. The Professional shall process Applications for Payment as specified in the Technical Specifications.

15.3 Contractor's Warranty of Title

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

15.4 Processing of Applications for Payment

15.4.1 The Professional will, within ten (10) calendar Days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application for Payment to the Town, or return the Application for Payment to Contractor indicating in writing Professional's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application For Payment. The Town shall, within thirty-one (31) calendar Days of presentation to them of the Application for Payment with Professional's recommendation of the amount for payment, pay Contractor amount recommended, unless the Town has reasons to refuse or contest the amount of the Application for Payment.

15.4.2 The Professional's recommendation of any payment requested in an Application for Payment will constitute a representation by the Professional to the Town based on the Professional's review of the Application for Payment and the accompanying data and schedules, that to the best of Professional's knowledge, information and belief that:

The Work has progressed to the point indicated on the Application for Payment;

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

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

15.4.3 By recommending any such payment, the Professional will not thereby be deemed to have represented that: (i) exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to the Professional in the Contract Documents or (ii) that there may not be other matters or issues between the parties that might entitle the Contractor to be paid additionally by the Town or entitle the Town to withhold payment to the Contractor.

15.4.4 The Professional's recommendation of any payment, including final payment, shall not mean that the Professional is responsible for Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the Contractor to comply with Laws and Regulations applicable to the furnishing or performance of Work, or for any failure of the Contractor to perform or furnish Work in accordance with the Contract Documents.

15.4.5 The Professional may refuse to recommend the whole or any part of any payment if, in the Professional's opinion, he/she is unable to make the representation that the Application for Payment is acceptable to the Town. The Professional may refuse to recommend payment on the basis of the factors enumerated in the Technical Specifications, or for any other reason where it in good faith determines that it cannot recommend payment in the amount stated in the Application for Payment. The Professional may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in Professional's opinion to protect the Town from loss because or by reason of any of the factors or conditions as specified in the Technical Specifications.

15.4.6 The Town will give the Contractor immediate notice stating the reasons for such action and promptly pay the Contractor the amount so withheld, or any adjustment thereto agreed to by the Town and the Contractor, when Contractor corrects to the satisfaction of the Town and Professional the reasons for such action.

15.5 Substantial Completion

15.5.1 Substantial Completion is the stage in the progress of the Work when the Work or specified portion thereof is sufficiently complete in accordance with the Contract Documents so the Town can occupy or utilize the Work for its proposed use.

15.5.2 When the Contractor considers that the Work, or a specified portion thereof, which the Town agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Professional a thorough and inclusive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on this list does not relieve the Contractor of the responsibility to complete all Work in accordance with the Contract Documents. Upon receipt of the Contractor's list, the Professional and Project Manager will visit the site to determine whether the Work or designated portion thereof is substantially complete. If the Professional's and the Project Manager's visit discloses any item, whether or not included on the Contractor's list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item, upon notification by the Professional. The Contractor shall then submit a request for another visit by the Professional to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Professional will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, and shall fix the time within which the Contractor shall

finish all items on the list accompanying the Certificate. Warranties required by the Contract Document shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Contractor for their written acceptance and then to the Town for acceptance and issuance.

15.5.3 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Professional, the Town shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof as provided in the Contract Documents.

15.5.4 The Town shall have the right to exclude the Contractor from the Work after the date of Substantial Completion, but the Town shall allow the Contractor reasonable access to complete or correct items on the list.

15.6 Beneficial Use

15.6.1 Use by the Town or General Public, at the Town's option, of any substantially completed part of the Work which is identified in the Contract Documents, or portions of the Work which the Town, Professional, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by the Town or General Public for its intended purpose without significant interference with the Contractor's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

15.6.2 The Town at any time may request the Contractor in writing to permit the Town or General Public to use any such part of the Work which the Town believes to be ready for its intended use and substantially complete. If the Contractor agrees that such part of the Work is substantially complete, the Contractor will certify to the Town and the Professional in writing that the Contractor considers any such part of the Work ready for its intended use and substantially complete and request the Professional to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, the Town, Contractor and Professional shall make an inspection of that part of the Work to determine its status of completion. If the Professional does not consider that part of the Work to be substantially complete, the Professional will notify the Town and the Contractor in writing giving the reasons therefore. If the Professional considers that part of the Work to be substantially complete, the provisions of 15.5 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto. The Town, may at its discretion, reduce the amount of retainage subject to this declaration of partial Substantial Completion.

15.7 Final Inspection

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

15.8 Application for Final Payment

15.8.1 After the Contractor has completed all such corrections to the satisfaction of the Professional and the Town and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance as required by the Contract Documents, certificates of inspection, marked-up record documents and other documents, and after the Professional has indicated that the completed Work is acceptable and in accordance with the Contract Documents, the Contractor may make Application for Final Payment following the procedure for progress payments. The Application for Final Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, (ii) consent of the surety, if any, to final payment, and (iii) complete and legally effective releases or waivers (satisfactory to Town) of any and all claims of any person or entity providing labor, services or materials to the Project. In lieu of such releases or waivers of liens and as approved by Town, Contractor may furnish receipts or release

in full and an affidavit of the Contractor that (i) the releases and receipts include all labor, services, material and equipment for which a lien could be filed, and (ii) all payrolls, material and equipment bills and other indebtedness connected with the Work for which Town or Town's property might in any way be responsible, have been paid or otherwise satisfied. If any Subcontractor or supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to the Town to indemnify Town against any lien.

15.8.2 No Application for Final Payment will be recommended for payment by the Professional or accepted by the Town until each and every document to be delivered by the Contractor pursuant to the Contract Documents are accepted and approved by the Professional.

15.8.3 Notwithstanding any other provision of these Contract Documents to the contrary, the Town and the Professional are under no duty or obligation whatsoever to any vendor, materials provider, Subcontractor, laborer or other party to ensure that payments due and owing by the Contractor to any of them are or will be made. Such parties shall rely only on the Contractor's surety Bonds for remedy of nonpayment by him. The Contractor agrees to defend and resolve all claims made by Subcontractors, indemnifying the Town and the Professional for all claims arising from or resulting from Subcontractor or supplier or material men or laborer services in connection with this project.

15.9 Final Payment and Acceptance

15.9.1 If, on the basis of the Professional's observation of the Work during construction and final inspection, and the Professional's review of the Application for Final Payment and accompanying documentation as required by the Contract Documents, the Professional is satisfied that the Work has been completed and the Contractor's other obligations under the Contract Documents have been fulfilled, the Professional will, within fifteen (15) Working Days after receipt of the Application for Final Payment, indicate in writing the Professional's recommendation of payment and present the Application for Final Payment to the Town for payment. Otherwise, the Professional will return the Application for Final Payment to the Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case the Contractor shall make the necessary corrections and resubmit the Application for Final Payment. After the presentation to the Town of the Application for Final Payment and accompanying documentation, in appropriate form and substance, and with the Professional's recommendation and notice of acceptability, the amount recommended by the Professional will become due and will be paid by the Town to the Contractor, along with any retainage not yet paid, within thirty (30) days after receipt of the Professional's recommendation for Final Payment.

15.9.2 If, through no fault of the Contractor, Final Completion of the Work is significantly delayed and if the Professional so confirms, the Town shall, upon receipt of the Contractor's Application for Final Payment and recommendation of the Professional, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by the Town for Work not fully completed or corrected is less than the retainage stipulated in the Contract, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Professional with the application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

15.10 Waiver of Claims

15.10.1 Submission of an Application for Final Payment and receipt of payment as a result thereof shall operate as and constitute a waiver and release of any and all claims by the Contractor against the Town other than those previously made in writing and still unsettled.

15.10.2 Conditions of the Technical Specifications are hereby reiterated.

ARTICLE 16 - SUSPENSION OF WORK AND TERMINATION

16.1 Suspension of Work

16.1.1 At any time and without cause, the Town may suspend the Work or any portion thereof for a period of not more than ninety (90) Days by notice in writing to the Contractor and the Professional, which will fix the date on which Work will be resumed. The Contractor shall resume the Work on the date so fixed. The Contractor shall be allowed an adjustment in the Contract Sum or an extension of the Contract Times, or both, directly attributable to any such suspension if the Contractor makes any approved claim therefore as provided in Articles 12 and 13.

16.1.2 If through no act or fault of the Contractor, the Work is suspended for a period of more than ninety (90) calendar Days by the Town or under an order of court or other public authority, or the Professional fails to act on any Application for Payment within thirty (30) calendar Days after it is submitted or the Town fails for thirty-one (31) calendar Days to pay the Contractor any sum recommended for payment by the Professional, then the Contractor may upon seven (7) Working Days written notice to the Town and the Professional, and provided the Town or the Professional did not remedy such suspension or failure within that time, terminate the Contract and recover from the Town payment on the same terms as provided in 16.3. In lieu of terminating the Contract and without prejudice to any other right or remedy, if the Professional has failed to act on an Application for Payment within thirty (30) calendar Days after it is submitted, or the Town has failed for thirty-one (31) calendar Days to pay the Contractor any sum recommended for payment by the Professional, the Contractor may upon seven (7) Day's written notice to the Town and the Professional stop the Work until payment of all such amounts due the Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude the Contractor from making claim under Articles 12 and 13 for an increase in Contract Sum or Contract Times or otherwise for expenses or damage directly attributable to the Contractor's stopping Work as permitted by this paragraph.

16.2 Termination For Cause

16.2.1 Upon the occurrence of any one or more of the following events:

If the Contractor fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled Workers or suitable materials or equipment, or failure to adhere to the progress schedule established);

If the Contractor disregards Laws or Regulations of any public body having jurisdiction;

If the Contractor disregards the authority of the Professional or Project Manager or;

If the Contractor otherwise violates in any substantial way any provisions of the Contract Documents;

The Town may, after giving the Contractor seven (7) Working Days' written notice, and to the extent permitted by Laws and Regulations, terminate the services of the Contractor and terminate the Contract, exclude the Contractor from the site and take possession of the Work and of all the Contractor's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by the Contractor (without liability to the Contractor for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which the Town has paid the Contractor but which are stored elsewhere, and finish the Work as Town may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment beyond an amount equal to the value of the Work actually completed and the value of materials and equipment not incorporated in the Work but delivered and suitably stored, less the aggregate of payments previously made. If the direct and indirect costs of completing the Work exceed the unpaid balance of the Contract Sum, the Contractor shall pay the difference to the Town within 60 days. Such costs incurred by the Town shall be verified by the Professional and incorporated in a Change Order, but in finishing the Work the Town shall not be required to obtain the lowest figure for the Work performed. The Contractor's obligations to pay the difference between such costs and such unpaid balance shall survive termination of the Contract.

16.2.2 In the event the Town terminates the Contract for cause and it is subsequently judicially determined that there was no cause for termination, the termination for convenience provision will be the means for disposition of the balance of the Contract obligations.

16.2.3 Notwithstanding, the Town may terminate this Contract immediately upon any lapse in the insurance coverage to be retained by the Contractor.

16.3 Termination for Convenience

16.3.1 Upon seven (7) Working Days' written notice to the Contractor and the Professional, the Town may, without cause and without prejudice to any other right or remedy of the Town, elect to terminate the Contract. In such case, the Contractor shall be paid (without duplication of any items):

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

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

For all claims, costs, losses and damages incurred in settlement of terminated contracts with Subcontractors, suppliers and others; and

For reasonable expenses directly attributable to termination.

The Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss or incidental or consequential damages of any type or nature arising out of or resulting from such termination.

17 Disputes

17.1 All disputes arising under the Contract of Contract Documents or their interpretation, whether involving law or fact or both, or extra Work, and all claims for alleged breach of contract shall within ten (10) Working Days of the commencement of the dispute be presented by the Contractor to the Town for decision. All papers pertaining to claims shall be filed in quadruplicate. Such notice need not detail the amount of the claim but shall state the facts surrounding the claim in sufficient detail to identify the claim, together with its character and scope. In the meantime, the Contractor shall proceed with the Work as directed. Any claim not presented within the time limit specified in this paragraph shall be deemed to have been waived, except that if the claim is of a continuing character and notice of the claim is not given within ten (10) Days of its commencement, the claim will be considered only for a period commencing ten (10) Days prior to the receipt by the Town of notice thereof. Each decision by the Town will be in writing and will be mailed to the Contractor by registered or certified mail, return receipt requested, directed to his last known address.

17.1.1 If the Contractor does not agree with any decision of the Town, he shall seek mediation by a certified circuit court civil mediator who will be agreed to by the parties or, if the parties cannot agree to a mediator within thirty (30) calendar Days of the request for mediation, said mediator will be chosen by the Town. The parties will cooperate in good faith with the mediator with the cost of the mediator split equally between the parties.

17.1.2 If the Contractor does not agree with any decision of the Town, or the mediation is unsuccessful, he shall in no case allow the dispute to delay the Work but shall notify the Town promptly that he is proceeding with the Work under protest and may then except the matter in question from the final release.

18 Miscellaneous

18.1 Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the address specified in the Contract.

18.2 When any period of time is referred to in the Contract Documents by Days, it will be computed to exclude the first and include the last Day of such period. If the last Day of any such period falls on a Saturday or Sunday or on a Day made a legal holiday by the law of the applicable jurisdiction, such Day will be omitted from the computation. A calendar Day of twenty-four hours measured from midnight to the next midnight will constitute a Day.

18.3 All representations, warranties, and guarantees made in the Contract Documents will survive final payment and termination or completion of the Contract. Also the obligation of the Contractor to maintain the Work until initiation of operation shall survive final payment and termination completion of the Contract.

18.4 The Contractor shall keep adequate records and supporting documentation applicable to this Work and Contract. Said records and documentation shall be retained by the Contractor for a minimum of five (5) years from the date of Final Completion or termination of the Contract. The Town shall have the right to audit, inspect, and copy all such records and documentation as often as the Town deems necessary during the period of the Contract and for a period of five (5) years thereafter provided, however, such activity shall be conducted only during normal business hours. The Town, during this period of time, shall also have the right to obtain a copy of and otherwise inspect any audit made at the direction of the Contractor as concerns the aforesaid records and supporting documentation.

18.5 In the event of any litigation arising from the performance of the Work or any alleged breach of the Contract or Contract Documents the prevailing party shall be entitled to recover reasonable attorneys fees (at both the trial and appellate level) and venue of any such action shall be in a court of competent jurisdiction in Sarasota or Manatee County. Each party to this Contract waives and relinquishes their right to intimate or pursue any action in any court except for the court of competent jurisdiction in Sarasota or Manatee County, Florida.

END OF SECTION

SECTION 00710

PERFORMANCE AND PAYMENT BOND

BY THIS BOND, we _____, as Principal, and _____, a corporation, as Surety, are bound to the Town of Longboat Key, herein called Owner, in the sum of \$ _____ (words) (_____) Performance and Payment Bond in the amount of 100% of total Contract Sum) for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the contract dated _____, 2014, between Principal and Owner for Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls, the contract being made a part of this bond by reference, at the times and in the manner prescribed in the contract; and
2. Promptly makes payments to all claimants, as defined in Section 255.05(1) Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the Work provided for in the contract; and
3. Pays Owner all losses, damages, expenses, costs, and attorney's fees, including appellate proceedings, that Owner sustains because of a default by Principal under the contract; and
4. Performs the guarantee of all Work and materials furnished under the contract for the time specified in the contract, then this bond is void; otherwise it remains in full force.

Any action instituted by a claimant under this bond for payment must be in accordance with the notice and time limitation provisions in Section 255.05(2), Florida Statutes.

Any changes in or under the Contract Documents and compliance or noncompliance with any formalities connected with the contract or the changes does not affect Surety's obligation under this bond.

Changes in the Contract Sum shall be immediately reflected in the amount of the bond and Principal shall provide copy of verification from Surety to the Owner regarding such changes.

Dated on _____.

Performance and Payment Bond, page 2 of 2

Any claims under this bond may be addressed to the name and address of Surety below. IN WITNESS WHEREOF, the PRINCIPAL and SURETY signed and sealed this instrument this _____ Day of _____, 2014.

SURETY: _____
LICENSE: _____

Surety's Attorney in Fact: _____
ADDRESS: _____

TELEPHONE: _____

By: _____ as Attorney in Fact.

State of Florida, County of Sarasota

The foregoing instrument was acknowledged before me this _____ Day of _____, 2014, by _____, who is personally known to me or who has produced _____, as identification and who did (did not) take an oath and who acknowledged before me that he executed the same for the purposes therein expressed.

NOTARY PUBLIC

Typed Name

Commission Expires: _____

PRINCIPAL: _____

Principal's Attorney in Fact: _____
ADDRESS: _____

By: _____ as Attorney in Fact.

APPROVED as to form:

BY: _____
Maggie Mooney-Portale, Town Attorney

END OF SECTION

SECTION 01001

GENERAL REQUIREMENTS

PART 1 – GENERAL

1.01 SCOPE AND INTENT

A. Description

1. The work to be done consists of the furnishing of all labor, materials and equipment, and the performance of all work included in this Contract. The summary of the work is presented in Section 01010.

B. Work Included

1. The CONTRACTOR shall furnish all labor, superintendence, materials, plant, power, light, heat, fuel, tools, appliances, equipment, supplies, and other means of construction necessary or proper for performing and completing the work. The CONTRACTOR shall obtain and pay for all required permits. The CONTRACTOR shall perform and complete the work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the ENGINEER, and in strict accordance with the Contract Documents. The CONTRACTOR shall clean up the work and maintain it during and after construction, until accepted, and shall do all work and pay all costs incidental thereto. The CONTRACTOR shall repair or restore all structures and property that may be damaged or disturbed during performance of the work.
2. The cost of incidental work described in these General Requirements, for which there are no specific Contract Items, shall be considered as part of the general cost of doing the work and shall be included in the prices for the various Contract Items. No additional payment will be made therefore.
3. The CONTRACTOR shall provide and maintain such modern plant, tools, and equipment as may be necessary, in the opinion of the ENGINEER, to perform in a satisfactory and acceptable manner all the work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The CONTRACTOR shall be solely responsible for the adequacy of their workmanship, materials and equipment, prior approval of the ENGINEER notwithstanding.
4. The CONTRACTOR shall remove, demolish and dispose of all equipment, piping, asphalt, rock and appurtenances as shown on the Drawings and required to complete the work. No additional payment will be made for additional demolition or disposal work, not specifically specified on the plans as required, to complete the work.
5. The CONTRACTOR shall perform all work in accordance with applicable local, state, and federal codes and regulations.

C. Public Utility Installations and Structures

1. Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, house service connections, vaults, manholes and all other appurtenances and facilities pertaining thereto whether owned or controlled by the OWNER, other governmental bodies or privately owned by individuals, firms or corporations, used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage, water or other public or private property which may be affected by the work shall be deemed included hereunder.
2. The Contract Documents contain data relative to existing public utility installations and

structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the CONTRACTOR to make his own investigations to inform himself fully of the character, condition and extent of all such installations and structures as may be encountered and as may affect the construction operations.

3. The CONTRACTOR shall protect all public utility installations and structures from damage during the work. Access across any buried public utility installation or structure shall be made only in such locations and by means approved by the ENGINEER. The CONTRACTOR shall so arrange his operations as to avoid any damage to these facilities. All required protective devices and construction shall be provided by the CONTRACTOR at his expense. All existing public utilities damaged by the CONTRACTOR which are shown on the Plans or have been located in the field by the utility shall be repaired by the CONTRACTOR, at his expense, as directed by the ENGINEER. No separate payment shall be made for such protection or repairs to public utility installations or structures.
4. Public utility installations or structures owned or controlled by the OWNER or other governmental body which are shown on the Drawings to be removed, relocated, replaced or rebuilt by the CONTRACTOR shall be considered as a part of the general cost of doing the work and shall be included in the prices bid for the various contract items. No separate payment shall be made therefore.
5. Where public utility installations or structures owned or controlled by the OWNER or other governmental body are encountered during the course of the work, and are not indicated on the Drawings or in the Specifications, and when, in the opinion of the ENGINEER, removal, relocation, replacement or rebuilding is necessary to complete the work under this Contract, such work shall be accomplished by the utility having jurisdiction, or such work may be ordered, in writing by the ENGINEER, for the CONTRACTOR to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously and the CONTRACTOR shall give full cooperation to permit the utility to complete the removal, relocation, replacement or rebuilding as required. If such work is accomplished by the CONTRACTOR, it will be in accordance with the Contract Documents.
6. All OWNERS and other governmental utility departments and other owners of public utilities which may be affected by the work have been informed in writing by ENGINEER. Such notice will set out, in general, and direct attention to the responsibilities of the OWNER and other governmental utility departments and other owners of public utilities for such installations and structures as may be affected by the work and will be accompanied by one set of Drawings and Specifications covering the work under such Contract or Contracts.
7. In addition to the general notice given by the ENGINEER, the CONTRACTOR shall give written notice to OWNER and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations, at least one (1) week in advance of breaking ground in any area or on any unit of the work. This can be accomplished by making the appropriate contact with the "Underground Facilities Location Service (1-800-432-4770)."
8. The maintenance, repair, removal, relocation or rebuilding of public utility installations and structures, when accomplished by the CONTRACTOR as herein provided, shall be done by methods approved by the ENGINEER.

1.02 DRAWINGS AND SPECIFICATIONS

A. Drawings

1. The Drawings referred to in the Contract Documents bear the general project name and number as shown in the Invitation to Bid (Advertisement).
2. When obtaining data and information from the Drawings, figures shall be used in preference

to scaled dimensions, and large scale drawings in preference to small scale drawings.

B. Copies Furnished to CONTRACTOR

1. After the Contract has been executed, the CONTRACTOR will be furnished with five sets of paper prints, the same size as the original drawings, of each sheet of the Drawings and five copies of the Specifications. Additional copies of the Drawings and Specifications, when requested, may be furnished to the CONTRACTOR at cost of reproduction.
2. The CONTRACTOR shall furnish each of the subcontractors, manufacturers, and material suppliers such copies of the Contract Documents as may be required for their work.

C. Supplementary Drawings

1. When, in the opinion of the ENGINEER, it becomes necessary to explain more fully the work to be done or to illustrate the work further or to show any changes which may be required, drawings known as Supplementary Drawings, with specifications pertaining thereto, will be prepared by the ENGINEER and five paper prints thereof will be given to the CONTRACTOR.

D. CONTRACTOR to Check Drawings and Data

1. CONTRACTOR shall verify all dimensions, quantities and details shown on the Drawings, Supplementary Drawings, Schedules, Specifications or other data received from the ENGINEER, and shall notify him of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the CONTRACTOR of full responsibility for unsatisfactory work, faulty construction or improper operation resulting therefrom nor from rectifying such conditions at his own expense. The CONTRACTOR will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the ENGINEER, should such errors or omissions be discovered. All schedules are given for the convenience of the ENGINEER and the CONTRACTOR and are not guaranteed to be complete. The CONTRACTOR shall assume all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in work to be done under the Contract.

E. Specifications

1. 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 for the work and shall always govern whenever there appears to be a conflict.

F. Intent

1. All work called for in the Specifications applicable to this Contract, but not shown on the Drawings 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 Drawings or in 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.
2. 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.
3. The inclusion of the Related 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.

1.03 MATERIALS

A. Manufacturer

1. The names of proposed manufacturers, material, suppliers and dealers who are to furnish materials shall be submitted to the ENGINEER for approval. Such approval must be obtained before shop drawings will be checked. No manufacturer will be approved for any materials to be furnished under this Contract unless he shall be of good reputation and have a plant of ample capacity. The CONTRACTOR shall, upon the request of the ENGINEER, be required to submit evidence that he has manufactured a similar product to the one specified and that it has been previously used for a like purpose for a sufficient length of time to demonstrate its satisfactory performance.
2. All transactions with the manufacturers or subcontractors shall be through the CONTRACTOR, unless the CONTRACTOR shall request, in writing to the ENGINEER, that the manufacturer or subcontractor deal directly with the ENGINEER. Any such transactions shall not in any way release the CONTRACTOR from his full responsibility under this Contract.
3. Any two or more pieces of material or equipment of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer.

B. Delivery

1. The CONTRACTOR shall deliver materials in ample quantities to insure the most speedy and uninterrupted progress of the work so as to complete the work within the allotted time. The CONTRACTOR shall also coordinate deliveries in order to avoid delay in, or impediment of, the progress of the work of any related CONTRACTOR.
2. The CONTRACTOR shall deliver materials and equipment in MANUFACTURER'S original unopened and undamaged containers with legible labeling. Materials and equipment shall be stored in such manner as to prevent damage from environment and construction operations. Handling shall be in accordance with MANUFACTURER's requirements.

1.04 INSPECTION AND TESTING

A. General

1. Inspection and testing of materials will be performed by the CONTRACTOR unless otherwise specified.
2. For tests specified to be made by the CONTRACTOR, the testing personnel shall make the necessary inspections and tests and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Five copies of the reports shall be submitted and authoritative certification thereof must be furnished to the ENGINEER as a prerequisite for the acceptance of any material or equipment.
3. If, in the making of any test of any materials, it is ascertained by the ENGINEER that the material or equipment does not comply with the Contract, the CONTRACTOR will be notified thereof and he will be directed to refrain from delivering said materials or to remove it promptly from the site or from the work and replace it with acceptable material, without cost to the OWNER.

B. Costs

1. All inspection and testing of materials furnished under this Contract will be performed by the CONTRACTOR or duly authorized inspection ENGINEERS or inspection bureaus in accordance with appropriate bid items.

2. Materials submitted by the CONTRACTOR as the equivalent to those specifically named in the Contract may be tested by the OWNER for compliance. The CONTRACTOR shall reimburse the OWNER for the expenditures incurred in making such tests on materials which are rejected for non-compliance.

C. Inspection of Materials

1. The CONTRACTOR shall give notice in writing to the ENGINEER, sufficiently in advance of his intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the ENGINEER will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials or he will notify the CONTRACTOR that the inspection will be made at a point other than the point of manufacture, or he will notify the CONTRACTOR that inspection will be waived. The CONTRACTOR must comply with these provisions before shipping any material. Such inspection shall not release the CONTRACTOR from the responsibility for furnishing materials meeting the requirements of the Contract Documents.

D. Certificate of Manufacture

1. When inspection is waived or when the ENGINEER so requires, the CONTRACTOR shall furnish to him authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the work have been manufactured and tested in conformity with the Contract Documents. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

E. Final Field Tests

1. Upon completion of the work and prior to final payment, all materials installed under this Contract shall be subjected to acceptance tests as specified or required to prove compliance with the Contract Documents.
2. The CONTRACTOR shall furnish labor, fuel, energy, and all other materials, equipment and instruments necessary for all acceptance tests, at no additional cost to the OWNER. The Furnishing Supplier shall assist in the final field tests as applicable.

F. Failure of Tests

1. Any defects in the materials or their failure to meet the tests, guarantees or requirements of the Contract Documents shall be promptly corrected by the CONTRACTOR by replacements or otherwise. The decision of the ENGINEER as to whether or not the CONTRACTOR has fulfilled his obligations under the Contract shall be final and conclusive. If the CONTRACTOR fails to make these corrections or if the improved materials, when tested, shall again fail to meet the guarantees or specified requirements, the OWNER, notwithstanding its partial payment for work, and materials, may reject the materials and may order the CONTRACTOR to remove them from the site at his own expense.
2. In case the OWNER rejects any materials, then the CONTRACTOR shall replace the rejected materials within a reasonable time. If he fails to do so, the OWNER may, after the expiration of a period of thirty (30) calendar days after giving him notice in writing, proceed to replace such rejected materials, and the cost thereof shall be deducted from any compensation due or which may become due the CONTRACTOR under his Contract.

G. Final Inspection

1. During such final inspections, the work shall be clean and free from water. In no case will the final estimate be prepared until the CONTRACTOR has complied with all requirements set forth and the ENGINEER has made his final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily constructed in accordance with the requirements of the Contract Documents.

1.05 TEMPORARY STRUCTURES

A. Responsibility for Temporary Structures

1. In accepting the Contract, the CONTRACTOR assumes full responsibility for the sufficiency and safety of all temporary structures or work and for any damage which may result from their failure or their improper construction, maintenance or operation and will indemnify and save harmless the OWNER from all claims, suits or actions and damages or costs of every description arising by reason of failure to comply with the above provisions.

1.06 SAFETY

A. Accident Prevention

1. Precautions shall be exercised at all times for the protection of person and property. The safety provisions of applicable laws, building and construction codes shall be observed. The CONTRACTOR shall comply with the U.S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596), and under Section 107 of the contract Work Hours and Safety Standards Act (PL-54), except where state and local safety standards exceed the federal requirements and except where state safety standards have been approved by the Secretary of Labor in accordance with provisions of the Occupational Safety and Health Act, shall be complied with.

B. First Aid

1. The CONTRACTOR shall keep upon the site, at each location where work is in progress, a completely equipped first aid kit and shall provide ready access thereto at all times when people are employed on the work.

1.07 LINES AND GRADES

A. Grade

1. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings, or as approved by the ENGINEER. The full responsibility for keeping alignment and grade shall rest upon the CONTRACTOR.
2. The ENGINEER has established bench marks as shown on the drawings. Reference marks for lines and grades as the work progresses will be located in such a manner by the CONTRACTOR as to cause as little inconvenience to the prosecution of the work as possible. The CONTRACTOR shall so place excavation and other materials as to cause no inconvenience in the use of the reference marks provided. The CONTRACTOR shall remove any obstructions placed by him contrary to this provision.

B. Surveys

1. The CONTRACTOR shall furnish and maintain, at his own expense, stakes and other such materials, and give such assistance, including qualified helpers, as may be required by the ENGINEER for setting reference marks. The CONTRACTOR shall check such reference marks by such means as he may deem necessary and, before using them, shall call the

ENGINEER's attention to any inaccuracies. The CONTRACTOR shall, at his own expense, establish all working or construction lines and grades as required from the reference marks set by the ENGINEER, and shall be solely responsible for the accuracy thereof.

C. Safeguarding Marks

1. CONTRACTOR shall safeguard all points, stakes, grade marks, monuments and bench marks made or established on the work, bear the cost of reestablishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes and marks.
2. The CONTRACTOR shall safeguard all existing and known property corners, monuments and marks adjacent to but not related to the work and, if required, shall bear the cost of reestablishing them if disturbed or destroyed.

D. Datum Plane

1. All elevations indicated or specified refer to the North American Vertical Datum of 1988 (NAVD88).

1.08 ADJACENT STRUCTURES AND LANDSCAPING

A. Responsibility

1. The CONTRACTOR shall also be entirely responsible and liable for all damage or injury as a result of his operations to all other adjacent public and private property, structures of any kind and appurtenances thereto met with during the progress of the work. The cost of protection, replacement in their original locations and conditions or payment of damages for injuries to such adjacent public and private property and structures affected by the work, whether or not shown on the Drawings, and the removal, relocation and reconstruction of such items called for on the Drawings or specified shall be included in the various Contract Items and no separate payments will be made therefore. Where such public and private property, structures of any kind and appurtenances thereto are not shown on the Drawings and when, in the opinion to avoid interference with the work, payment therefore will be made as provided for in the General Conditions.
2. CONTRACTOR is expressly advised that the protection of buildings, structures, tunnels, tanks, pipelines, etc. and related work adjacent and in the vicinity of his operations, wherever they may be, is solely his responsibility. Conditional inspection of buildings or structures in the immediate vicinity of the project which may reasonably be expected to be affected by the Work shall be performed by and be the responsibility of the CONTRACTOR.
3. CONTRACTOR shall, before starting operations, make an examination of the interior and exterior of the adjacent structures, buildings, facilities, pools, etc., and record by notes, measurements, photographs, etc., conditions which might be aggravated by open excavation and construction. Repairs or replacement of all conditions disturbed by the construction shall be made to the satisfaction of the OWNER and to the satisfaction of the ENGINEER. This does not preclude conforming to the requirements of the insurance underwriters. Copies of surveys, photographs, reports, etc., shall be given to the ENGINEER.
4. Prior to the beginning of any excavations the CONTRACTOR shall advise the ENGINEER of all buildings or structures on which he intends to perform work or which performance of the project work will affect.

B. Lawn Areas

1. Lawn areas shall be left in as good condition as before the starting of the work. Where sod is to be removed, it shall be carefully removed, and later replaced, restored with new sod, or left as bare soil in the manner described in these specifications or on the drawings.

1.09 PROTECTION OF WORK AND PUBLIC

A. Barriers and Lights

1. During the prosecution of the work, the CONTRACTOR shall put up and maintain at all times such barriers and lights as will effectually prevent accidents. The CONTRACTOR shall provide suitable barricades, red lights, "danger" or "caution" or "street closed" signs and watchmen at all places where the work causes obstructions to the normal traffic or constitutes in any way a hazard to the public, in accordance with state and local requirements.

B. Smoke Prevention

1. The CONTRACTOR shall use hard coal, coke, oil or gas as fuel for equipment generating steam. A strict compliance with ordinances regulating the production and emission of smoke will be required. No open fires will be permitted.

C. Noise

1. The CONTRACTOR shall eliminate noise to as great as extent as practicable at all times. Electric or quiet pumps shall be used as the primary to limit noise. Backup fuel powered pumps are acceptable. Air compressing plants shall be equipped with silencers and the exhaust of all gasoline motors or other power equipment shall be provided with mufflers. The CONTRACTOR shall strictly observe all local regulations and ordinances covering noise control.
2. Sound levels shall not exceed 65dba during working hours. This sound level to be measured at the property line of the nearest residence and/or commercial structure. 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 for excessive noise shall not relieve the CONTRACTOR of the other portions of this specification including, but not limited to contract time and contract price.
3. The CONTRACTOR shall refer to Specification Section 00300 for allowable work hours.
4. If mufflers cannot achieve the necessary noise reduction, noise abatement shall be accomplished by the CONTRACTOR's installation of baffles (or other acceptable means) positioned to break line-of-site from the noise source to affected residences and/or commercial structures. Minimum noise abatement measures shall consist of equipping all engines with hospital grade mufflers or silencers.

D. Access to Public Services

1. Neither the materials excavated nor the materials or plant used in the construction of the work shall be so placed as to prevent free access to all fire hydrants, valves or manholes.

E. Dust Prevention

1. The CONTRACTOR shall prevent dust nuisance from his operations or from traffic by keeping the roads and/or construction areas sprinkled with water at all times.

1.10 CUTTING AND PATCHING

- A. The CONTRACTOR shall do all cutting, fitting or patching of his portion of the work that may be required to make the several parts thereof join and coordinate in a manner satisfactory to the ENGINEER and in accordance with the Drawings and Specifications. The work must be done by competent workmen skilled in the trade required by the restoration.

1.11 CLEANING

A. During Construction

1. During construction of the work, the CONTRACTOR shall, at all times, keep the site of the work and adjacent premises as free from material, debris and rubbish as is practicable and shall remove the same from any portion of the site if, in the opinion of the ENGINEER, such material, debris, or rubbish constitutes a nuisance or is objectionable.
2. The CONTRACTOR shall remove from the site all of his surplus materials and temporary structures when no further need therefore develops.
3. The CONTRACTOR shall be responsible and liable for all spillage and incur all associated costs including, but not limited to, costs related to repair and maintenance resulting from damages thereof.

B. Final Cleaning

1. At the conclusion of the work, all erection plant, tools, temporary structures and materials belonging to the CONTRACTOR shall be promptly taken away, and he shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances.
2. The CONTRACTOR shall thoroughly clean all materials installed by him and shall deliver such materials undamaged and in a clean condition.

1.12 MISCELLANEOUS

A. Protection Against Siltation and Bank Erosion

1. The CONTRACTOR shall arrange his operations to minimize siltation and bank erosion on construction sites and on existing or proposed water courses and drainage ditches.
2. The CONTRACTOR, at his own expense, shall remove any siltation deposits and correct any erosion problems as directed by the ENGINEER which results from his construction operations.

B. Existing Facilities

1. The work shall be so conducted to maintain existing facilities in operation insofar as is possible. Requirements and schedules of operations for maintaining existing facilities in service during construction shall be as described in these Specifications.

C. Use of Chemicals

1. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

D. Tie-Ins

1. Reference Section 01014 for additional requirements regarding tie-ins to existing water mains.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01002

INFORMATION AVAILABLE TO BIDDERS

PART 1 – GENERAL

1.01 REPORTS

- A. The ENGINEER has relied upon a specific purpose survey by George F. Young, Inc. The survey has been provided with the drawings. The CONTRACTOR may obtain additional copies of the survey at the cost of reproduction.

The survey is provided for the CONTRACTOR's convenience and is for general information only. The CONTRACTOR is solely responsible for his own interpretations of the data.

- B. The ENGINEER has relied upon a subsurface exploration and geotechnical engineering investigation of the area 1) Report of Geotechnical Investigation Longboat Key Potable Water Interconnect Subaqueous Crossing Longboat Key, FL DES 126997, January 11, 2013 and 2) Report of Geotechnical Investigation Longboat Key Potable Water Interconnect Subaqueous Crossing Longboat Key, FL DES 126997, March 19, 2013 and 3) Addendum to Report of Geotechnical Investigation Longboat Key Potable Water Interconnect Subaqueous Crossing Longboat Key, FL DES 126997, December 09, 2013 performed by Driggers Engineering Services, Inc.. The reports are available with purchase of the contract documents or for review at the CDM Smith Office located at 1715 N Westshore Blvd, Suite 875, Tampa, FL 33607 (813-281-2900). The report is for general information only and is not part of the Contract Documents. The CONTRACTOR is solely responsible for his own interpretations of the geotechnical data. The report is represented to only provide a general indication of the types of conditions likely to be found in the vicinity. The CONTRACTOR may at his own expense obtain additional geotechnical information.

1.02 UTILITIES

Existing utilities have been shown on the Drawings insofar as information is reasonably available; however, it will be the CONTRACTOR's responsibility to preserve all existing utilities whether shown on the Plans or not. If utility conflicts are encountered by the CONTRACTOR during construction, he shall give sufficient notice to their owners so that they may make the necessary adjustments. Damage to any utilities which, in the opinion of the OWNER, is caused by carelessness on the part of the CONTRACTOR shall be repaired at the CONTRACTOR's expense. Any delays ensuing from this damage will be considered as inexcusable.

1.03 PERMITS OBTAINED BY THE OWNER

- A. The following permits have been obtained by the OWNER. A copy of these permits are attached to this Section for the CONTRACTOR's convenience. The Town will renew or file for a time extension of any expired permits. The CONTRACTOR is solely responsible for compliance to all conditions of the permits.
- 1 The Florida Department of Environmental Protection (FDEP) Environmental Resource Permit (ERP)
 - 2 U.S. Army Corps of Engineers (ACOE) Construction Permit
 - 3 FDEP Authorization to Use Sovereign Submerged Lands
 - 4 FDEP Specific Permit to Construct a Potable Water System (PWS) Permit

- 5 FDEP Coastal Construction Control Line Permit
- 6 FDOT ROW Utilization Permit

1.04 EASEMENTS/AGREEMENTS OBTAINED BY THE OWNER

- A. The OWNER has obtained easements/agreements for this project and a copy of these easement/agreements will be provided to the CONTRACTOR's by the OWNER prior to issuance of the Notice to Proceed. The CONTRACTOR is responsible for complying with and satisfying the conditions of the easement/agreements. See Section 01100, 1.15 for additional requirements of CONTRACTOR obtained easements.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION



FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION

SOUTHWEST DISTRICT OFFICE
13051 NORTH TELECOM PARKWAY
TEMPLE TERRACE, FLORIDA 33637-0926

RICK SCOTT
GOVERNOR

CARLOS LOPEZ-CANTERA
LT. GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

May 19, 2014

Town of Longboat Key
c/o Juan J. Florensa, Public Works Director
600 General Harris Street
Longboat Key, FL 34228
jflorensa@longboatkey.org

File No.: 41-0316192-003
BOT No.: 410237243
Easement No.: 41558
Manatee County

Dear Mr. Florensa:

On April 30, 2014, we received your request for verification of exemption to perform the following activities:

Installation of a new 16-inch water main, via-open cut trenching and horizontal directional drill (HDD) across Longboat Pass from the south end of Coquina Beach to the north end of Longboat Key. Additionally, this approval is for the installation of a new master water meter and vault, and a new pressure reducing station (PRS) on the north end of Longboat Key. Work will take place within uplands along Gulf of Mexico Drive and the HDD will occur under Longboat Key Pass, part of the Sarasota Bay Estuarine System, a Class II Special Outstanding Florida Waterbody within the boundaries of Easement No. 41558.

In the event of a frac-out, the attached Frac-out Contingency Plan shall be implemented. Additionally, the standard Manatee Conditions for In-Water Work shall be followed for all in-water activity. The permittee shall notify the Florida Fish and Wildlife Conservation Commission at imperiledspecies@myfwc.com upon the occurrence of any collision with or injury of a manatee.

Your request has been reviewed to determine whether it qualifies for (1) regulatory exemption, (2) proprietary authorization (related to state-owned submerged lands), and (3) federal approval that may be necessary for work in wetlands or waters of the United States.

Your project did not qualify for the federal review portion of this verification request. **Additional authorization must be obtained prior to commencement of the proposed activity.** This letter does not relieve you from the responsibility of obtaining other federal, state, or local authorizations that may be required for the activity. Please refer to the specific section(s) dealing with that portion of the review below for advice on how to proceed.

1. Regulatory Review –Verified

Based on the information submitted, the Department has determined that the project described above is exempt, under Section 373.406(6) of the Florida Statutes, from the need to obtain a regulatory permit under Part IV of Chapter 373 of the Florida Statutes. This determination is made because the activity, in consideration of its type, size, nature, location, use, and operation, is expected to have only minimal or insignificant individual or cumulative adverse impacts on the water resources.

This exemption verification is based on the information you provided the Department and the statutes and rules in effect when the information was submitted. This verification may not be valid if site conditions materially change, the project design is modified, or the statutes or rules governing the exempt activity are amended. In the event you need to re-verify the exempt status for the activity, a new request and verification fee will be required. Any substantial modifications to the project design should be submitted to the Department for review, as changes may result in a permit being required.

2. Proprietary Review - Granted

In addition, your project occurs on state-owned, sovereign, submerged lands and will require authorization from the Board of Trustees of the Internal Improvement Trust Fund to use public property. As staff to the Board of Trustees, we have reviewed your project, and as long as the work is performed as described in the attached project drawings, is wholly located within the boundaries of the existing easement (BOT # 410237243) and is consistent with the terms and conditions therein, we have no objection to the project. Therefore, consider this letter to also constitute the authority sought under Section 253.77, F.S. to pursue this project.

3. Federal Review - SPGP Not Approved

Your proposed activity as outlined on your application and attached drawings **does not qualify** for Federal authorization pursuant to the State Programmatic General Permit and a **SEPARATE permit** or authorization **may be required** from the Corps. A copy of your permit application has been forwarded to the Corps for their review. The Corps will issue their authorization directly to you or contact you if additional information is needed. If you have not heard from the Corps within 30 days from the date your application was received at the local FDEP Office, contact the Corps at the Tampa Regulatory Field Office at (813) 769-7073 for status and further information. **Failure to obtain Corps authorization prior to construction could subject you to federal enforcement action by that agency.**

Authority for review - an agreement with the USACOE entitled "Coordination Agreement Between the U. S. Army Corps of Engineers (Jacksonville District) and the Florida Department of Environmental Protection, or Duly Authorized Designee, State Programmatic General Permit", Section 10 of the Rivers and Harbor Act of 1899, and Section 404 of the Clean Water Act.

Additional Information

Please retain this letter. The activities may be inspected by authorized state personnel in the future to ensure compliance with appropriate statutes and administrative codes. If the activities are not in compliance, you may be subject to penalties under Chapter 373, F.S., and Chapter 18-14, F.A.C.

NOTICE OF RIGHTS

This action is final and effective on the date filed with the Clerk of the Department unless a petition for an administrative hearing is timely filed under Sections 120.569 and 120.57, F.S., before the deadline for filing a

petition. On the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice.

Petition for Administrative Hearing

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. Pursuant to Rule 28-106.201, F.A.C., a petition for an administrative hearing must contain the following information:

- (a) The name and address of each agency affected and each agency's file or identification number, if known;
- (b) The name, address, any email address, any facsimile number, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests are or will be affected by the agency determination;
- (c) A statement of when and how the petitioner received notice of the agency decision;
- (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
- (e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;
- (f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
- (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000. Also, a copy of the petition shall be mailed to the applicant at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with Rule 62-110.106(3), F.A.C., petitions for an administrative hearing by the applicant must be filed within 21 days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under Section 120.60(3), F.S. must be filed within 21 days of publication of the notice or within 21 days of receipt of the written notice, whichever occurs first. Under Section 120.60(3), F.S., however, any person who has asked the Department for notice of agency action may file a petition within 21 days of receipt of such notice, regardless of the date of publication. The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

Extension of Time

Under Rule 62-110.106(4), F.A.C., a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, before the applicable

deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

Mediation is not available in this proceeding.

FLAWAC Review

The applicant, or any party within the meaning of Section 373.114(1)(a) or 373.4275, F.S., may also seek appellate review of this order before the Land and Water Adjudicatory Commission under Section 373.114(1) or 373.4275, F.S. Requests for review before the Land and Water Adjudicatory Commission must be filed with the Secretary of the Commission and served on the Department within 20 days from the date when the order is filed with the Clerk of the Department.

Judicial Review

Any party to this action has the right to seek judicial review pursuant to Section 120.68, F.S., by filing a Notice of Appeal pursuant to Rules 9.110 and 9.190, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, M.S. 35, Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this action is filed with the Clerk of the Department.

Thank you for applying to the Submerged Lands and Environmental Resource Permit Program. If you have any questions regarding this matter, please contact Brittany Banko via email at Brittany.banko@dep.state.fl.us or at by phone at 813-470-5747.

Executed in Hillsborough County, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Sincerely,



Kelley M. Boatwright
Program Administrator
Permitting Programs
Southwest District

KB/bb

Enclosures:

Section 373.406(6), F. S.
Standard Manatee Construction Conditions for In-water Work
Attachment "A" For Discretionary Publication

Attachments:

Frac-Out Plan
Project drawings

cc:

U.S. Army Corps of Engineers, TampaReg@usace.army.mil
Doug Fry, Doug.Fry@dep.state.fl.us
Karen Lowe, LoweKS@cdmsmith.com

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this determination, including all copies, was mailed before the close of business on May 19, 2014, to the above listed persons.

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to 120.52(7),
Florida Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.

Clerk *Joanne Musitano* Date May 19, 2014

373.406(6), Florida Statutes

(6) Any district or the department may exempt from regulation under this part those activities that the district or department determines will have only minimal or insignificant individual or cumulative adverse impacts on the water resources of the district. The district and the department are authorized to determine, on a case-by-case basis, whether a specific activity comes within this exemption. Requests to qualify for this exemption shall be submitted in writing to the district or department, and such activities shall not be commenced without a written determination from the district or department confirming that the activity qualifies for the exemption.

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

- a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
- b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Any collision with or injury to a manatee shall be reported immediately to the FWC Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or Vero Beach (1-772-562-3909) for south Florida, and to FWC at ImperiledSpecies@myFWC.com
- f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the Florida Fish and Wildlife Conservation Commission (FWC) must be used (see MyFWC.com/manatee). One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8 1/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. Questions concerning these signs can be sent to the email address listed above.

CAUTION: MANATEE HABITAT

All project vessels

IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work
all in-water activities must

SHUT DOWN

Report any collision with or injury to a manatee:

Wildlife Alert:

1-888-404-FWCC(3922)

cell *FWC or #FWC



ATTACHMENT "A" FOR DISCRETIONARY PUBLICATION OF NOTICE OF DETERMINATION
OF QUALIFICATION FOR AN EXEMPTION

In the Matter of an Application
for a Determination of Qualification
for an Exemption by:

Town of Longboat Key
c/o Juan J. Florensa, Public Works Director
600 General Harris Street
Longboat Key, FL 34228

DEP File No.: 41-0316192-003; County: Manatee

The Department of Environmental Protection gives notice that it has received a request for authorization to install a 16-inch water main by open cut trenching and horizontal directional drilling (HDD). The open cut installation will occur along Gulf of Mexico Drive starting at 2650 to 7140 Gulf of Mexico Drive, Longboat Key, Sections 10 and 15, Township 25 South, Range 16 East, Manatee County. The HDD will occur from the south end of Coquina Beach to the north end of Longboat Key under Longboat Key Pass, part of the Sarasota Bay Estuarine System, a Class II Special Outstanding Florida Waterbody within the boundaries of Easement No. 41558. The Department has determined that the project qualifies for an exemption established under 373.406(6), Florida Statutes.

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the F.S. The petition must contain the information set forth below and must be filed (received by the clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000.

Mediation is not available.

If a timely and sufficient petition for an administrative hearing is filed, other persons whose substantial interests will be affected by the outcome of the administrative process have the right to petition to intervene in the proceeding. Intervention will be permitted only at the discretion of the presiding officer upon the filing of a motion in compliance with rule 28-106.205 of the Florida Administrative Code.

In accordance with rule 62-110.106(3), F.A.C., petitions for an administrative hearing must be filed within 21 days of publication of the notice or receipt of written notice, whichever occurs first. Under rule 62-110.106(4) of the F.A.C., a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000 prior to the applicable deadline. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon. Upon motion by the requesting party showing that the failure to file a request for an extension of time before the deadline was the result of excusable neglect, the Department may also grant the requested extension of time.

The petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition for an administrative hearing within the appropriate time period shall constitute a waiver of that right.

A petition that disputes the material facts on which the Department's action is based must contain the following information:

- (a) The name and address of each agency affected and each agency's file or identification number, if known;
- (b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests are or will be affected by the agency determination;
- (c) A statement of when and how the petitioner received notice of the agency decision;
- (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
- (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action;
- (f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action; and
- (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts on which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by rule 28-106.301, F.A.C.

Under sections 120.569(2) (c) and (d) of the Florida Statutes, a petition for administrative hearing shall be dismissed by the agency if the petition does not substantially comply with the above requirements or is untimely filed.

Complete copies of all documents relating to this determination of exemption are available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, at the Department's Southwest District Office, 13051 North Telecom Parkway, Temple Terrace, FL 33637-0926.

Inadvertent Return and Surface Spill Contingency Plan

The following provides an example plan to deal with the inadvertent release of drilling fluids, also known as frac-out, during horizontal direction drilling (HDD) operations. Drilling fluids, such as a bentonite clay mixture may be release during drilling operations at any location along the drill path. The contractor will be required to submit a copy of his/her specific plan for approval by the engineer prior to the start of any HDD drilling activities. The plan should include the following components at a minimum:

1. Operational procedures and responsibilities for the prevention of a frac-out
2. Detection for frac-outs
3. Containment of the spill and environmental protection procedures
4. Clean-up of the spill
5. Notifications procedure to the engineer, owner and regulatory agencies
6. Final HDD project clean-up procedures

Prevention and Detection

Prior to the start of all HDD activities, the drill crew shall receive appropriate training to ensure they are familiar with the provisions of the following:

1. The frac-out contingency plan
2. Individual responsibilities during a frac-out event
3. Equipment maintenance requirements
4. Site specific permit and monitoring requirements
5. Inspection procedures for release prevention and proper use of the containment equipment and materials.

The drilling contractor will designate a Site Supervisor who will be responsible for being on-site during all drilling activities, being familiar with and implementing the frac-out contingency plan, and for ensuring that all employees are properly trained prior to any drilling. A copy of the frac-out plan must be readily accessible to all employees on-site.

Appropriate clean-up equipment to include a vacuum truck, silt fence, squeegee, soil erosion fence, hay bales, rakes, shovels, and turbidity curtain to equal depth of water shall be stored on site and readily accessible during all drilling activities. All equipment shall be stored such that it is readily available and easily mobilized for immediate use in

the event of an accidental release of drilling mud (frac-out). Exit and entry pits shall be enclosed by silt fences.

The drilling contractor shall monitor all slurry returns to ensure that the volume of return is as expected. If a decrease in return volume is noted, all work shall cease and an investigation to identify the potential frac-out locations (on land and in the water), will be initiated immediately.

Containment and Clean Up

Once a spill had been detected, clean-up procedures shall begin immediately and be in accordance with the frac-out plan. The Site Supervisor is responsible for coordinating the appropriate spill response, cleanup, proper disposal of recovered material, and timely reporting of the incident.

The Site Supervisor will evaluate the situation and direct recommended actions. If the frac-out is minor, easily contained, and is not threatening sensitive resources, drilling operations may resume and surface monitoring will continue.

If the frac-out has reached the surface, any material contaminated with bentonite shall be contained, removed, and properly disposed of. If necessary, an earthen berm, silt fence, or straw bales may be constructed around the frac-out to entrap released drilling fluid.

If the frac-out reaches the waterway, HDD operations will cease (until remedied) and any necessary steps will be taken to clean-up the spill and properly dispose of materials.

When the release has been contained and cleaned up, response closeout activities will be conducted at the direction of the Site Supervisor. The recovered drilling fluid shall be either recycled or hauled to an approved facility for disposal. No recovered drilling fluids will be discharged in streams, storm drains or any water source. All frac-out excavation and clean-up sites will be returned to pre-project contours using clean fill, as necessary.

Abandonment of the bore hole will only be required when all efforts to control the frac-out within the existing directional bore has failed.

Notifications

The Site Supervisor shall notify the project manager. The project manager will in turn notify the general contractor, owner and engineer immediately of any spills (regardless of size). The general contractor will be responsible to notify any additional personnel as required.

The following information shall be provided for all frac-out events:

- Name and telephone number of person reporting;

- Location of the release;
- Date and time of release;
- Type and quantity, estimated size of release;
- How the release occurred;
- The type of activity that was occurring around the area of the frac-out;
- Description of any sensitive areas, and their location in relation to the frac-out;
- Description of the methods used to clean up or secure the site.

Project Clean-up

When drilling and HDD activities have been completed, the entry and exit sump pits shall be filled and returned to natural grade. All protective barriers (fiber rolls, straw bale, silt fence, turbidity curtain etc.) will remain in place until after soil stabilization has been achieved.



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
10117 PRINCESS PALM AVENUE, SUITE 120
TAMPA, FLORIDA 33610

March 8, 2013

REPLY TO
ATTENTION OF

Regulatory Division
Tampa Permits Section
SAJ-2013-00251(NW-CMW)

Town of Longboat Key
Juan Florensa, Public Works Director
600 General Harris St
Longboat Key, FL 34228

Dear Mr. Florensa:

The U.S. Army Corps of Engineers (Corps) assigned your application for a Department of the Army permit, which the Corps received on January 24, 2013, the file number SAJ-2013-00251. A review of the information and drawings provided indicates that the proposed work would result in the installation of approximately 2,200 linear feet of water main under Longboat Pass, installed via directional drill. The project is located adjacent to Gulf of Mexico Drive, in Sections 10 & 15, Township 35 South, Range 16 East, Longboat Key, Manatee County, Florida.

Your project, as depicted on the enclosed drawings, is authorized by Nationwide Permit (NWP) Number 12. In addition, project specific conditions have been enclosed. This verification is valid until March 18, 2017. Please access the U.S. Army Corps of Engineers' (Corps) Jacksonville District's Regulatory Internet page to access Internet links to view the Final Nationwide Permits, Federal Register Vol. 77, dated February 21, 2012, specifically pages 10270 – 10290, the Corrections to the Final Nationwide Permits, Federal Register 77, March 19, 2012, and the List of Regional Conditions. The Internet page address is:

<http://www.saj.usace.army.mil/Missions/Regulatory.aspx>

Please be aware this Internet address is case sensitive and should be entered as it appears above. Once there you will need to click on "Source Book"; and, then click on "Nationwide Permits." These files contain the description of the Nationwide Permit authorization, the Nationwide Permit general conditions, and the regional conditions, which apply specifically to this verification for NWP 12. Enclosed is a list of the six General Conditions, which apply to all Department of the Army authorizations. You must comply with all of the special and general conditions and any project specific condition of this authorization or you may be subject to enforcement action. In the event you have not completed construction of your project within the specified time limit, a separate application or re-verification may be required.

The following special conditions are included with this verification:

1. Within 60 days of completion of the work authorized, the attached *Self-Certification Statement of Compliance* must be completed and submitted to the U.S. Army Corps of Engineers. Mail the completed form to the Regulatory Division, Special Projects and Enforcement Branch, 10117 Princess Palm Avenue, Suite 120, Tampa, Florida 33610.

2. The Permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structures or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the U.S. Army Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

3. Cultural Resources/Historic Properties:

a. No structure or work shall adversely affect impact or disturb properties listed in the *National Register of Historic Places* (NRHP) or those eligible for inclusion in the NRHP.

b. If during the ground disturbing activities and construction work within the permit area, there are archaeological/cultural materials encountered which were not the subject of a previous cultural resources assessment survey (and which shall include, but not be limited to: pottery, modified shell, flora, fauna, human remains, ceramics, stone tools or metal implements, dugout canoes, evidence of structures or any other physical remains that could be associated with Native American cultures or early colonial or American settlement), the Permittee shall immediately stop all work in the vicinity and notify the Corps. The Corps shall then notify the Florida State Historic Preservation Officer (SHPO) and the appropriate Tribal Historic Preservation Officer(s) (THPO(s)) to assess the significance of the discovery and devise appropriate actions.

c. A cultural resources assessment may be required of the permit area, if deemed necessary by the SHPO, THPO(s), or Corps, in accordance with 36 CFR 800 or 33 CFR 325, Appendix C (5). Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume on non-federal lands without written authorization from the SHPO and the Corps.

d. In the unlikely event that unmarked human remains are identified on non-federal lands, they will be treated in accordance with Section 872.05 Florida Statutes. All work in the vicinity shall immediately cease and the Permittee shall immediately notify the medical examiner, Corps, and State Archeologist. The Corps shall then notify the appropriate SHPO and THPO(s). Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume without written authorization from the State Archeologist, SHPO, and the Corps.

e. In the unlikely event that human remains are encountered on federal or tribal lands, or in situations where Archaeological Resources Protection Act of 1979, or Native American Graves Protection Repatriation Act of 1990 applies, all work in the vicinity shall immediately cease and the Permittee immediately notify the Corps. The Corps shall then notify the appropriate THPO(s) and SHPO. Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. After such notification, project activities on federal lands shall not resume without written authorization from the Corps, and/or appropriate THPO(s), SHPO, and federal manager. After such notification, project activities on tribal lands shall not resume without written authorization from the appropriate THPO(s) and the Corps.

4. Erosion Control: Prior to the initiation of any work authorized by this permit, the Permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the work area. Immediately after completion of the final grading of the land surface, all slopes, land surfaces, and filled areas shall be stabilized using sod, degradable mats, barriers, or a combination of similar stabilizing materials to prevent erosion. The erosion control measures shall remain in place and be maintained until all authorized work has been completed and the site has been stabilized.

5. The Permittee shall comply with the "Standard Protection Measures for the Eastern Indigo Snake - 2004", provided as an enclosure in this permit.

This letter of authorization does not give absolute Federal authority to perform the work as specified on your application. The proposed work may be subject to local building restrictions mandated by the National Flood Insurance Program. You should contact your local office that issues building permits to determine if your site is located in a flood-prone area, and if you must comply with the local building requirements mandated by the National Flood Insurance Program.

If you are unable to access the internet or require a hardcopy of any of the conditions, limitations, or expiration date for the above referenced NWP, please contact me by telephone at 813-769-7064.

Thank you for your cooperation with our permit program. The Corps Jacksonville District Regulatory Division is committed to improving service to our customers. We strive to perform our duty in a friendly and timely manner while working to preserve our environment. We invite you to visit <http://per2.nwp.usace.army.mil/survey.html> and complete our automated Customer Service Survey. Your input is appreciated -- favorable or otherwise. Again, please be aware this Internet address is case sensitive and should be entered as it appears above.

Sincerely,



Digitally signed by
WHEELAHAN CANDICE MAIRE 124705500
DN: c=US, o=U.S. Government, ou=DoD,
sn=PRJ, ou=USDA,
cn=WHEELAHAN CANDICE MAIRE F242055
920
Date: 2013.03.08 13:36:22 -05'00'

Candice Wheelahan
Project Manager

Enclosures:
General Conditions
Statement of Compliance
Permit Transfer Request
Construction Drawings
2004 Standard Protection Measures for the Eastern Indigo Snake

Copy Furnished:
Christopher Alverson, CDM Smith, Inc. - via email (w/enc.)

GENERAL CONDITIONS

33 CFR PART 320-330

PUBLISHED FEDERAL REGISTER DATED 13 NOVEMBER 1986

1. The time limit for completing the work authorized ends on **date identified in the letter**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow a representative from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

DEPARTMENT OF THE ARMY PERMIT TRANSFER REQUEST

PERMIT NUMBER: SAJ-2013-00251(NW-CMW)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. Although the construction period for works authorized by Department of the Army permits is finite, the permit itself, with its limitations, does not expire.

To validate the transfer of this permit and the associated responsibilities associated with compliance with its terms and conditions, have the transferee sign and date below and mail to the U.S. Army Corps of Engineers, Enforcement Section, Post Office Box 4970, Jacksonville, FL 32232-0019.

(TRANSFEE-SIGNATURE)

(SUBDIVISION)

(DATE)

(LOT)

(BLOCK)

(NAME-PRINTED)

(STREET ADDRESS)

(MAILING ADDRESS)

(CITY, STATE, ZIP CODE)

SELF-CERTIFICATION STATEMENT OF COMPLIANCE

Permit Number: SAJ-2013-00251(NW-CMW)

Permittee's Name & Address (please print or type): _____

Telephone Number: _____

Location of the Work: _____

Date Work Started: _____ Date Work Completed: _____

Description of the Work (e.g. bank stabilization, residential or commercial filling, docks, dredging, etc.):

Acreage or Square Feet of Impacts to Waters of the United States: _____

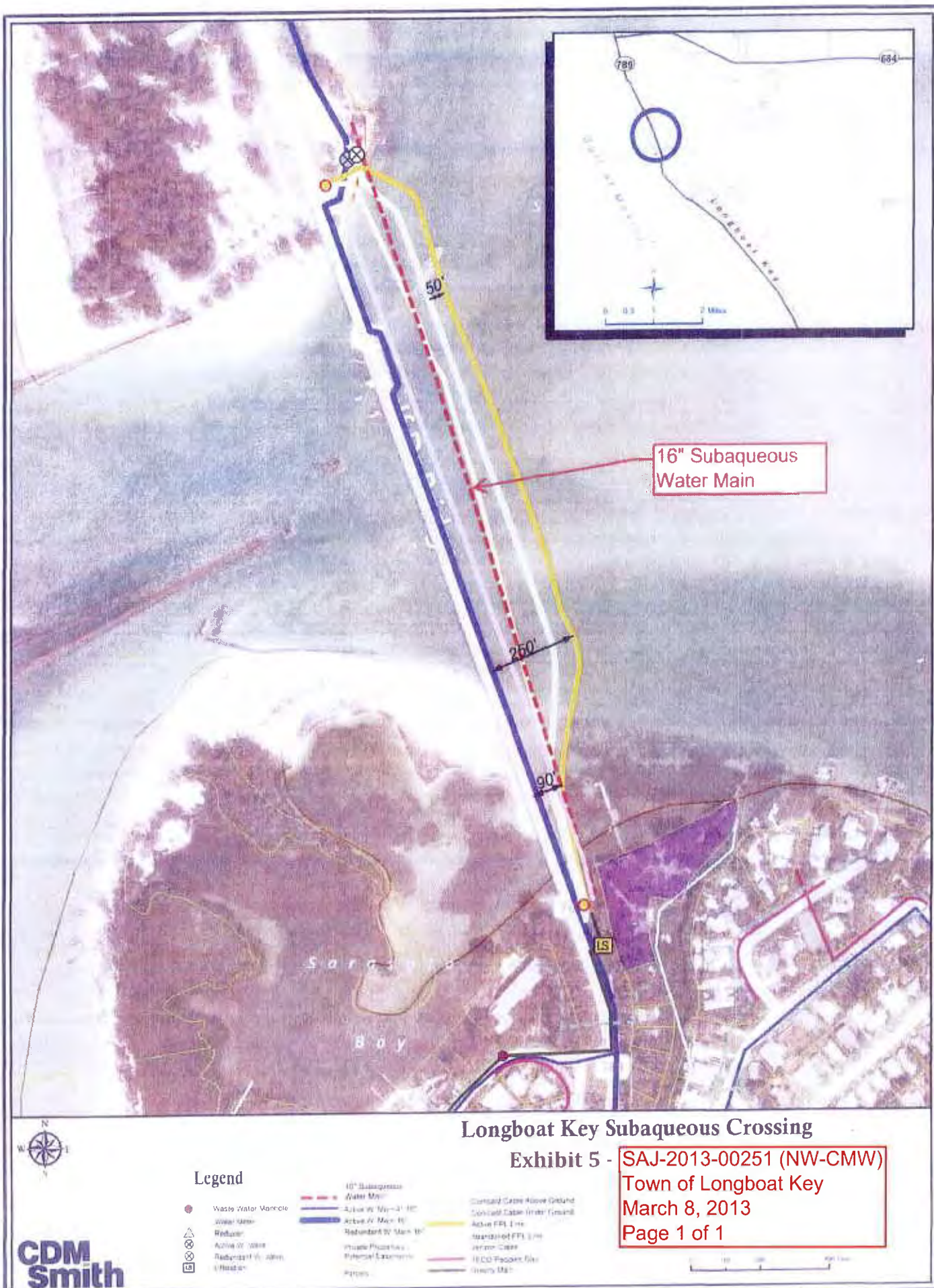
Describe Mitigation completed (if applicable): _____

Describe any Deviations from the Permit (attach drawing(s) depicting the deviations):

I certify that all work, and mitigation (if applicable), was done in accordance with the limitations and conditions as described in the permit. Any deviations as described above are depicted on the attached drawing(s).

Signature of Permittee

Date



STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

1. An eastern indigo snake protection/education plan shall be developed by the applicant or requestor for all construction personnel to follow. The plan shall be provided to the Service for review and approval at least 30 days prior to any clearing activities. The educational materials for the plan may consist of a combination of posters, videos, pamphlets, and lectures (*e.g.*, an observer trained to identify eastern indigo snakes could use the protection/education plan to instruct construction personnel before any clearing activities occur). Informational signs should be posted throughout the construction site and along any proposed access road to contain the following information:
 - a. a description of the eastern indigo snake, its habits, and protection under Federal Law;
 - b. instructions not to injure, harm, harass or kill this species;
 - c. directions to cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site on its own before resuming clearing; and,
 - d. telephone numbers of pertinent agencies to be contacted if a dead eastern indigo snake is encountered. The dead specimen should be thoroughly soaked in water and then frozen.
2. If not currently authorized through an Incidental Take Statement in association with a Biological Opinion, only individuals who have been either authorized by a section 10(a)(1)(A) permit issued by the Service, or by the State of Florida through the Florida Fish Wildlife Conservation Commission (FWC) for such activities, are permitted to come in contact with an eastern indigo snake.
3. An eastern indigo snake monitoring report must be submitted to the appropriate Florida Field Office within 60 days of the conclusion of clearing phases. The report should be submitted whether or not eastern indigo snakes are observed. The report should contain the following information:
 - a. any sightings of eastern indigo snakes and
 - b. other obligations required by the Florida Fish and Wildlife Conservation Commission, as stipulated in the permit.

Revised February 12, 2004



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard, MS# 125
Tallahassee, Florida 32399-3000

OSA cc@PW
Original to Town
Clerk

Rick Scott
Governor

Herschel T. Vinyard, Jr.
Secretary

December 12, 2013

Town of Longboat Key
Attn: Mr. Juan Florensa
501 Bay Isles Road
Longboat Key, FL 34228

BOT Lease No. 410237243
Lessee: Town of Longboat Key, Florida

Dear Mr. Florensa:

Enclosed is a fully executed **original** easement for **your** records. The **original** easement, at the option of the Lessee, **may** be recorded in the official records of the county where the easement site is located.

If the billing agent, phone number or fax number change, or there is a change in the lessee's tax status, please notify the BUREAU OF PUBLIC LAND ADMINISTRATION'S ACCOUNTING SECTION at (850) 245-2720 within 30 days of the date of any change.

Any future correspondence or inquiries should be directed to this office at the letterhead address above or at 850/245-2720.

Thank you for your assistance and cooperation in this matter.

Sincerely,

Kathy C. Griffin

Kathy C. Griffin
Government Operations Consultant I
Bureau of Public Land Administration
Division of State Lands

/kcg
Enclosures

cc: File



This Instrument Prepared By:
Tiana Brown
Recurring Revenue Section
Bureau of Public Land Administration
3900 Commonwealth Boulevard
Mail Station No. 125
Tallahassee, Florida 32399

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND
OF THE STATE OF FLORIDA

SOVEREIGNTY SUBMERGED LANDS EASEMENT

NO. 41558
BOT FILE NO. 410237243
PA NO. 41-0316192-001

THIS EASEMENT is hereby granted by the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida, hereinafter referred to as the Grantor.

WITNESSETH: That for the faithful and timely performance of and compliance with the terms and conditions stated herein, the Grantor does hereby grant to Town of Longboat Key, Florida, hereinafter referred to as the Grantee, a nonexclusive easement on, under and across the sovereignty lands, if any, contained in the following legal description:

A parcel of sovereignty submerged land in Sections 10 and 15,
Township 35 South, Range 16 East, in Longboat Pass,
Manatee County, as is more particularly described
and shown on Attachment A, dated February 18, 2013.

TO HAVE THE USE OF the hereinabove described premises for a period of 50 years from June 4, 2013, the effective date of this easement. The terms and conditions on and for which this easement is granted are as follows:

1. USE OF PROPERTY: The above described parcel of land shall be used solely for a subaqueous water main and Grantee shall not engage in any activity except as described in the State of Florida Department of Environmental Protection Environmental Resource Permit Exemption No. 41-0316192-001, dated February 19, 2013, incorporated herein and made a part of this easement by reference. All of the foregoing subject to the remaining conditions of this easement.

2. EASEMENT CONSIDERATION: In the event the Grantor amends its rules related to fees and the amended rules provide the Grantee will be charged a fee or an increased fee for this activity, the Grantee agrees to pay all charges required by such amended rules within 90 days of the date the amended rules become effective or by a date provided by an invoice from the Department, whichever is later. All fees charged under this provision shall be prospective in nature; i.e. they shall begin to accrue on the date that the amended rules become effective.

3. WARRANTY OF TITLE/GUARANTEE OF SUITABILITY OF USE OF LAND: Grantor neither warrants title to the lands described herein nor guarantees the suitability of any of the lands for any particular use.

4. RIGHTS GRANTED: The rights hereby granted shall be subject to any and all prior rights of the United States and any and all prior grants by the Grantor in and to the submerged lands situated within the limits of this easement.

5. DAMAGE TO EASEMENT PROPERTY AND INTERFERENCE WITH PUBLIC AND PRIVATE RIGHTS: Grantee shall not damage the easement lands or unduly interfere with public or private rights therein.

6. GRANTOR'S RIGHT TO GRANT COMPATIBLE USES OF THE EASEMENT PROPERTY: This easement is nonexclusive, and the Grantor, or its duly authorized agent, shall retain the right to enter the property or to engage in management activities not inconsistent with the use herein provided for and shall retain the right to grant compatible uses of the property to third parties during the term of this easement.

7. RIGHT TO INSPECT: Grantor, or its duly authorized agent, shall have the right at any time to inspect the works and operations of the Grantee in any matter pertaining to this easement.

8. INDEMNIFICATION/INVESTIGATION OF ALL CLAIMS: The Grantee shall investigate all claims of every nature at its expense. Each party is responsible for all personal injury and property damage attributable to the negligent acts or omissions of that party and the officers, employees and agents thereof. Nothing herein shall be construed as an indemnity or a waiver of sovereign immunity enjoyed by any party hereto, as provided in Section 768.28, Florida Statutes, as amended from time to time, or any other law providing limitations on claims.

9. ASSIGNMENT OF EASEMENT: This easement shall not be assigned or otherwise transferred without prior written consent of the Grantor or its duly authorized agent and which consent shall not be unreasonably withheld. Any assignment or other transfer without prior written consent of the Grantor shall be null and void and without legal effect.

10. TERMINATION: The Grantee, by acceptance of this easement, binds itself, its successors and assigns, to abide by the provisions and conditions herein set forth, and said provisions and conditions shall be deemed covenants of the Grantee, its successors and assigns. In the event the Grantee fails or refuses to comply with the provisions and conditions herein set forth or in the event the Grantee violates any of the provisions and conditions herein, this easement may be terminated by the Grantor upon 30 days written notice to Grantee. If terminated, all of the above-described parcel of land shall revert to the Grantor. All notices required to be given to Grantee by this easement or applicable law or administrative rules shall be sufficient if sent by U.S. Mail to the following address:

Town of Longboat Key, Florida
Attention: Mr. Juan Florensa
501 Bay Isles Road
Longboat Key, Florida 34228

The Grantee agrees to notify the Grantor by certified mail of any changes to this address at least ten (10) days before the change is effective.

11. TAXES AND ASSESSMENTS: The Grantee shall assume all responsibility for liabilities that accrue to the subject property or to the improvements thereon, including any and all drainage or special assessments or taxes of every kind and description which are now or may be hereafter lawfully assessed and levied against the subject property during the effective period of this easement which result from the grant of this easement or the activities of Grantee hereunder.

12. REMOVAL OF STRUCTURES/ADMINISTRATIVE FINES: If the Grantee does not remove said structures and equipment occupying and erected upon the premises after expiration or cancellation of this easement, such structures and equipment will be deemed forfeited to the Grantor, and the Grantor may authorize removal and may sell such forfeited structures and equipment after ten (10) days written notice by certified mail addressed to the Grantee at the address specified in Item 10 or at such address on record as provided to the Grantor by the Grantee. However, such remedy shall be in addition to all other remedies available to Grantor under applicable laws, rules and regulations including the right to compel removal of all structures and the right to impose administrative fines.

13. ENFORCEMENT OF PROVISIONS: No failure, or successive failures, on the part of the Grantor to enforce any provision, nor any waiver or successive waivers on its part of any provision herein, shall operate as a discharge thereof or render the same inoperative or impair the right of the Grantor to enforce the same upon any renewal thereof or in the event of subsequent breach or breaches.

14. RECORDATION OF EASEMENT: The Grantee, at its own expense, shall record this fully executed easement in its entirety in the public records of the county within which the easement site is located within fourteen (14) days after receipt, and shall provide to the Grantor within ten (10) days following the recordation a copy of the recorded easement in its entirety which contains the O.R. Book and pages at which the easement is recorded.

15. AMENDMENT/MODIFICATIONS: This easement is the entire and only agreement between the parties. Its provisions are not severable. Any amendment or modification to this easement must be in writing and must be accepted, acknowledged and executed by the Grantee and Grantor.

16. USACE AUTHORIZATION: Prior to commencement of construction and/or activities authorized herein, the Grantee shall obtain the U.S. Army Corps of Engineers (USACE) permit if it is required by the USACE. Any modifications to the construction and/or activities authorized herein that may be required by the USACE shall require consideration by and the prior written approval of the Grantor prior to the commencement of construction and/or any activities on sovereign, submerged lands.

17. ADDITIONAL STRUCTURES OR ACTIVITIES/EMERGENCY STRUCTURAL REPAIRS: No additional structures shall be erected and/or activities undertaken, including but not limited to, dredging, relocation/realignment or major repairs or renovations made to authorized structures, on, in or over sovereignty, submerged lands without the prior written consent from the Grantor, with the exception of emergency repairs. Unless specifically authorized in writing by the Grantor, such activities or structures shall be considered unauthorized and a violation of Chapter 253, Florida Statutes, and shall subject the Grantee to administrative fines under Chapter 18-14, Florida Administrative Code. If emergency repairs are required to be undertaken in the interests of public health, safety or welfare, the Grantee shall notify the Grantor of such repairs as quickly as is practicable; provided, however, that such emergency activities shall not exceed the activities authorized by this easement.

18. UPLAND RIPARIAN PROPERTY INTEREST: During the term of this easement, Grantee must have satisfactory evidence of sufficient upland interest as defined in subsection 18-21.003(60), Florida Administrative Code, to the extent required by paragraph 18-21.004(3)(b), Florida Administrative Code, in order to conduct the activity described in this easement. If at any time during the term of this easement, Grantee fails to comply with this requirement, use of sovereignty, submerged lands described in this easement shall immediately cease and this easement shall terminate and title to this easement shall revert to and vest in the Grantor immediately and automatically.

WITNESSES:

Michelle Brady
Original Signature

Michelle Brady
Print/Type Name of Witness

Kathy C Griffin
Original Signature

Kathy C Griffin
Print/Type Name of Witness

BOARD OF TRUSTEES OF THE INTERNAL
IMPROVEMENT TRUST FUND OF THE STATE
OF FLORIDA

(SEAL)

BY: Cheryl C McCall

Cheryl C. McCall, Chief, Bureau of Public Land Administration,
Division of State Lands, State of Florida Department of
Environmental Protection, as agent for and on behalf of the
Board of Trustees of the Internal Improvement Trust Fund of the
State of Florida

"GRANTOR"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 6th day of December, 2013, by
Cheryl C. McCall, Chief, Bureau of Public Land Administration, Division of State Lands, State of Florida Department of
Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State
of Florida She is personally known to me.

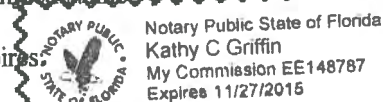
APPROVED AS SUBJECT TO PROPER EXECUTION:

Sam L. Brown 7/2/13
DEP Attorney Date

Kathy C Griffin
Notary Public, State of Florida

Printed, Typed or Stamped Name

My Commission Expires:



Commission/Serial No.

ATTEST:

Taish Granger
Original Signature

Taish Granger, Town Clerk
Typed/Printed Name of Witness

AGENCY

Approved as to Form and Correctness:

David Persson
Maggie Mooney-Portale, Town Attorney

David Persson for Maggie Mooney-Portale

STATE OF FLORIDA

COUNTY OF SARASOTA

Town of Longboat Key, Florida

(SEAL)

BY: SEE BELOW

Original Signature of Executing Authority

James L. Brown

Typed/Printed Name of Executing Authority

Mayor

Title of Executing Authority

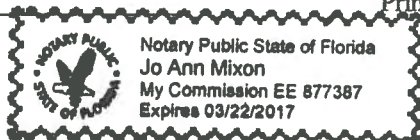
"GRANTEE"

My Commission Expires:

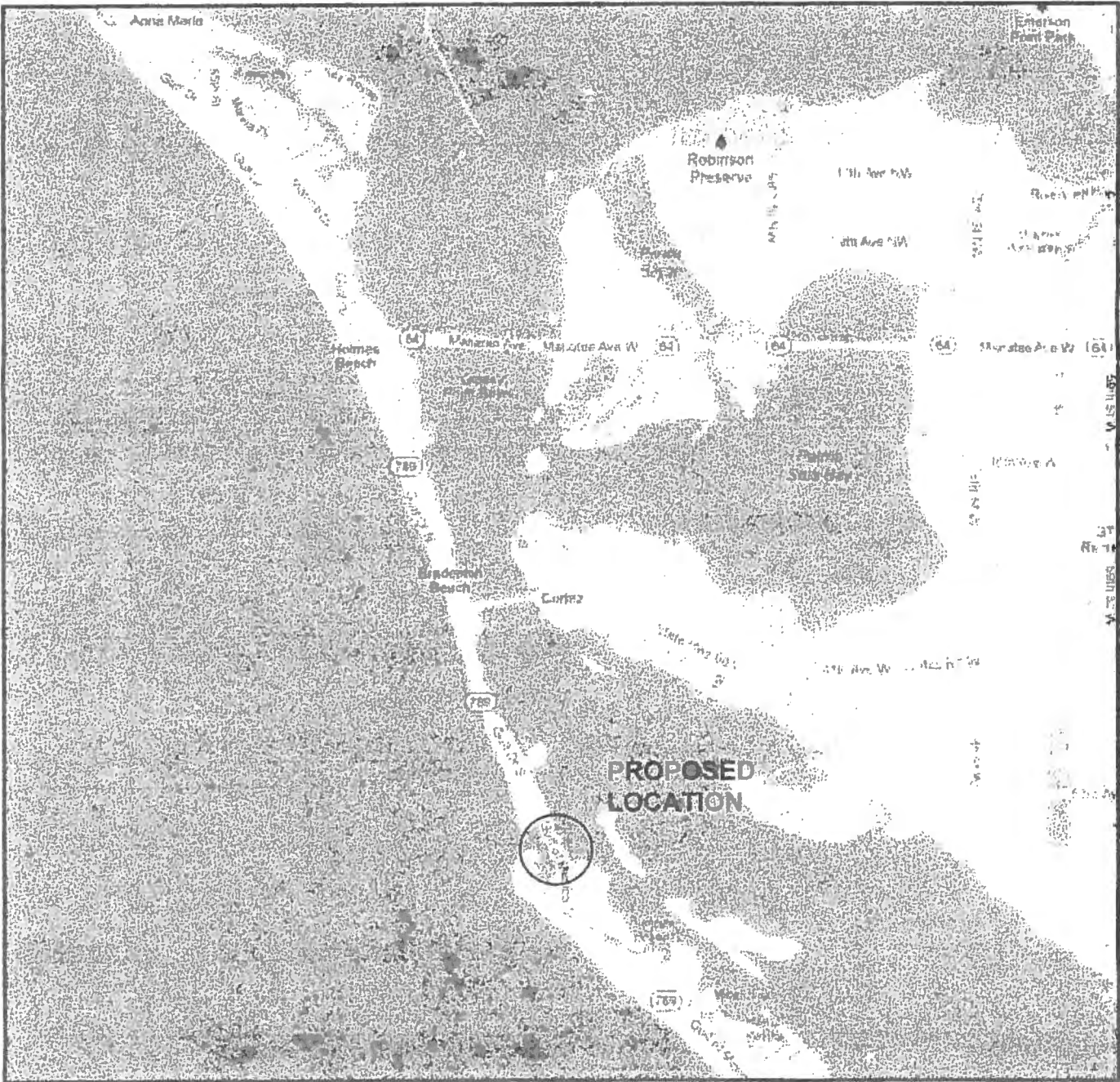
Commission/Serial No.

Jo Ann Mixon
Notary Public, State of Florida, County of Sarasota

Printed, Typed or Stamped Name



SOVEREIGN SUBMERGED
LAND EASEMENT



PREPARED FOR: Town of Longboat Key 501 Bay Isles Road Longboat Key, FL 34228	LONGBOAT PASS SUBMERGED LAND EASEMENT SECTION 10 & 15, TOWNSHIP 35 S., RANGE 15 E.	REVISED	BY	DATE	DESCRIPTION		
W. Andrew McLaughlin DATE 2/18/13		PSM LS 6512		George F. Young, Inc. 298 DR. MARTIN LUTHER KING JR. STREET, N. ST. PETERSBURG, FLORIDA 33701 PHONE (727) 822-4317 FAX (727) 822-2919 BUSINESS ENTITY LB21 ARCHITECTURE • ENGINEERING • ENVIRONMENTAL • LANDSCAPE • PLANNING • SURVEYING • UTILITIES GAINESVILLE • LAKEWOOD RANCH • ORLANDO • PALM BEACH GARDENS • ST. PETERSBURG • TAMPA • VENICE		JOB NO. 11017700SU SHEET NO. 1 OF 3	

SOVEREIGN SUBMERGED LAND EASEMENT

That part of the sovereign lands of the State of Florida that lie within a 20 foot wide strip, crossing Longboat Pass and being situated in Sections 10 and 15, Township 35 South, Range 16 East, Manatee County, Florida, more particularly described as follows:

Commence at the intersection of the easterly right-of-way line of State Road 789 as depicted in Florida Department of Transportation Right-of-Way Map Section 1308-176, with the southerly line of Lot 1, Block 22, Longbeach of Longboat Key, as recorded in Plat Book 6, Page 66, Public Records of Manatee County, Florida; thence proceed along said easterly right-of-way line, North 21° 14' 21" West, a distance of 153.30 feet to the Mean High Water Line (elevation 0.21 feet NAVD88, May 30, 2012) and the **POINT OF BEGINNING**; thence departing said easterly right-of-way line, proceed along the Mean High Water Line the following two courses: South 35° 56' 23" West, a distance of 12.60 feet; South 18° 03' 42" West, a distance of 10.12 feet; thence departing said Mean High Water Line, proceed North 19° 37' 43" West, a distance of 2023.90 feet, to the face of seawall and aforementioned Mean High Water Line elevation on the north side of Longboat Pass; thence along said seawall and Mean High Water Line, North 21° 56' 53" East, a distance of 30.14 feet; thence departing said seawall and Mean High Water Line, proceed South 19° 37' 43" East a distance of 2028.75 feet to the Mean High Water Line on south side of Longboat Pass; thence along said Mean High Water Line, South 33° 32' 37" West, a distance of 4.27 feet to the **POINT OF BEGINNING**.

LESS any lands lying upland of the Mean High Water Line.

Contains 4,443 square feet or 0.102 acres more or less, LESS any acreage lying upland of the Mean High Water Line.

NOTES:

1. Bearings shown hereon are referenced to Grid North, based on the Florida State Plane Coordinate System, West Zone (Transverse Mercator Projection), North American Datum of 1983, 2007 Adjustment; the easterly right of way line from Point of Commencement to Point of Beginning being N 21° 14' 21" W.
2. This is not a survey.
3. This sketch and description is designed to encompass a proposed subaqueous water main crossing Longboat Pass.
4. The Mean High Water Line is based on a 0.21 foot elevation contour line per Tide Interpolation Point #395, North American Vertical Datum of 1988 (NAVD88) as of May 30, 2012..
5. This is not a Mean High Water Line Survey. Mean High Water elevation was taken from published data provided by the Land Boundary Information System Internet website (www.labins.org). Mean High Water elevation is based upon extending published datum from Mean High Water Tide Interpolation Point Number 395, Manatee County, Quad Map Bradenton Beach, having a Mean High Water Elevation of 0.21 feet NAVD 88 and Mean Low Water of (-)1.10 feet NAVD 88.
6. Coordinates and elevations are based on National Geodetic Survey (NGS) Control Point "GIS-106" (NGS PID AG9211) having an elevation of 4.15 feet (NAVD88), Northing of 1132620.94 and Easting of 432524.81.
7. Existing right-of-way lines shown herein were calculated with the benefit of FDOT Right of Way Map Section 1308-176, dated October 15, 1956.
8. No Title Opinion or Abstract to the subject property has been provided. It is possible that there are Deeds, Easements, or other instruments (recorded or unrecorded) which may affect the subject property.
9. This sketch of description (sketch of easement/lease area) is in compliance with the Minimum Technical Standards pursuant to Chapter 5J-17, Florida Administrative Code.
10. Not valid without the signature and original raised seal of a Florida licensed Surveyor and Mapper.

LEGEND:

FDOT	Florida Department of Transportation
LB	Licensed Business
LS	Licensed Surveyor
MHWL	Mean High Water Line
NAVD88	North American Vertical Datum of 1988
P.O.B.	Point of Beginning
P.O.C.	Point of Commencement
PSM	Professional Surveyor and Mapper



George F. Young, Inc.

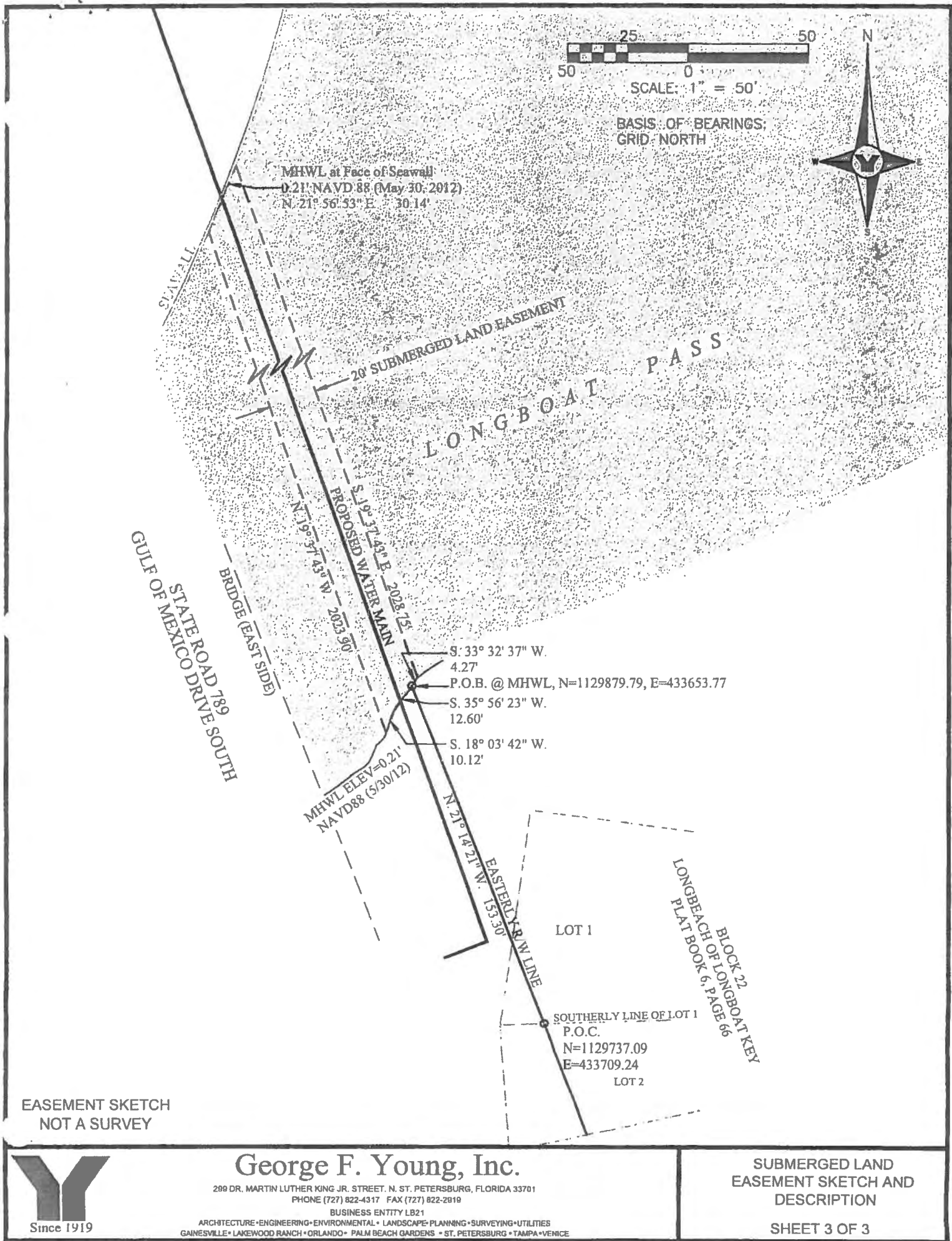
299 DR. MARTIN LUTHER KING JR. STREET, N. ST. PETERSBURG, FLORIDA 33701
PHONE (727) 822-4317 FAX (727) 822-2919

BUSINESS ENTITY LB21

ARCHITECTURE • ENGINEERING • ENVIRONMENTAL • LANDSCAPE • PLANNING • SURVEYING • UTILITIES
GAINESVILLE • LAKEWOOD RANCH • ORLANDO • PALM BEACH GARDENS • ST. PETERSBURG • TAMPA • VENICE

SUBMERGED LAND
EASEMENT SKETCH AND
DESCRIPTION

SHEET 2 OF 3



EASEMENT SKETCH
NOT A SURVEY



George F. Young, Inc.

299 DR. MARTIN LUTHER KING JR. STREET, N. ST. PETERSBURG, FLORIDA 33701
PHONE (727) 822-4317 FAX (727) 822-2919

BUSINESS ENTITY LB21

ARCHITECTURE • ENGINEERING • ENVIRONMENTAL • LANDSCAPE PLANNING • SURVEYING • UTILITIES
GAINESVILLE • LAKEWOOD RANCH • ORLANDO • PALM BEACH GARDENS • ST. PETERSBURG • TAMPA • VENICE

SUBMERGED LAND
EASEMENT SKETCH AND
DESCRIPTION

SHEET 3 OF 3



FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest District Office
13051 North Telecom Parkway
Temple Terrace, Florida 33637-0926

RICK SCOTT
GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

Notification of Acceptance of Use of a General Permit

Permittee:

Town of Longboat Key Utilities Department
Juan J. Florensa, Public Works Director
600 General Harris Street
Longboat Key, FL 34228
jflorensa@longboatkey.org

Permit Number: 0133068-1022-DSGP/02**Issue Date:** May 14, 2013**Expiration Date:** May 13, 2018**County:** Manatee**Project Name:** Potable Water System
Subaqueous Crossing of Longboat Pass and
Pressure Controls**Water Supplier:** Manatee County Utilities
Department**PWS ID:** 641-1132

Dear Mr. Florensa:

On May 2, 2013, the Florida Department of Environmental Protection received a “*Notice of Intent to Use the General Permit for Construction of Water Main Extensions for PWSs*” [DEP Form No. 62-555.900(7)], under the provisions of Rule 62-4.530 and Chapter 62-555, Florida Administrative Code (F.A.C.). The proposed project includes the construction of a new sixteen-inch diameter subaqueous water main that is located approximately 35 feet below Longboat Pass and a new six-inch diameter water main pipe and pressure reducing station located along State Road 789 (Gulf of Mexico Drive South).

Based upon the submitted Notice and accompanying documentation, this correspondence is being sent to advise that the Department does not object to the use of such general permit at this time. Please be advised that the permittee is required to abide by Rule 62-555.405, F.A.C., all applicable rules in Chapters 62-4, 62-550, 62-555, F.A.C., and the General Conditions for All General Drinking Water Permits (found in 62-4.540, F.A.C.).

The permittee shall comply with all sampling requirements specific to this project. These requirements are attached for review and implementation.

Pursuant to Rule 62-555.345, F.A.C., the permittee shall submit a certification of construction completion [DEP Form No. 62-555.900(9)] to the Department and obtain approval, or clearance, from the Department before placing any water main extension constructed under this general permit into operation for any purpose other than disinfection or testing for leaks.

Within 30 days after the sale or legal transfer of ownership of the permitted project that has not been cleared for service in total by the Department, both the permittee and the proposed permittee shall sign and submit an application for transfer of the permit using Form 62-

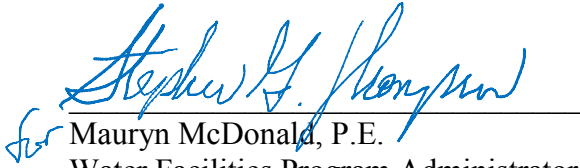
Permittee: DEP File No.: 0133068-1022-DSGP/02
Town of Longboat Key Utilities Department
Project: Potable Water System Subaqueous Crossing of Longboat Pass and Pressure Controls

Page 2

555.900(8), F.A.C., with the appropriate fee. The permitted construction is not authorized past the 30-day period unless the permit has been transferred.

This permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project, per Rule 62-4.030, F.A.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION


for Mauryn McDonald, P.E.
Water Facilities Program Administrator

Enclosures: A. General Permit Conditions
B. Clearance Requirements/Utilities Separation Requirements

cc: Gina C. Cashon, P.E., CDM Smith, CashonGC@cdmsmith.com
Craig C. Montgomery, P.E., CDM Smith, MontgomeryCC@cdmsmith.com
Daniel T. Gray, Manatee County Utilities Dept., dan.gray@mymanatee.org

A. General Permit Conditions

The permittee shall be aware of and operate under the Permit Conditions below. These applicable conditions are binding upon the permittee and enforceable pursuant to Chapter 403, Florida Statutes. [F.A.C. Rule 62-555.533(1)]

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in Subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in this permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times (reasonable time may depend on the nature of the concern being investigated), access to the premises where the permitted activity is located or conducted to:
 - a. Have access to and copy any records that must be kept under conditions of the permit;
 - b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
 - c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.
8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
 - a. A description of and cause of noncompliance; and
 - b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.
9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 62-302.500, shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard.
11. This permit is transferable only upon Department approval in accordance with Rule 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

- a. Determination of Best Available Control Technology (BACT)
- b. Determination of Prevention of Significant Deterioration (PSD)
- c. Certification of compliance with State Water Quality Standards (Section 401, PL 92-500)
- d. Compliance with New Source Performance Standards

14. The permittee shall comply with the following:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
- b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
- c. Records of monitoring information shall include:
 - i. the date, exact place, and time of sampling or measurements;
 - ii. the person responsible for performing the sampling or measurements;
 - iii. the dates analyses were performed;
 - iv. the person responsible for performing the analyses;
 - v. the analytical techniques or methods used;
 - vi. the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

B. CLEARANCE REQUIREMENTS

Requirements for clearance upon completion of projects are as follows:

1) Clearance Form

Submission of a fully completed Department of Environmental Protection (DEP) Form 62-555.900(9) *Certification of Construction Completion and Request for Clearance to Place Permitted PWS Components into Operation*.

2) Record Drawings, If Deviations Were Made

Submission of the portion of record drawings showing deviations from the DEP construction permit, including preliminary design report or drawings and specifications, if there are any deviations from said permit (Note that it is necessary to submit a copy of only the portion of record drawings showing deviations and not a complete set of record drawings.).

3) Bacteriological Results

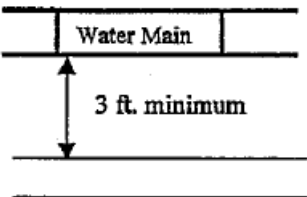
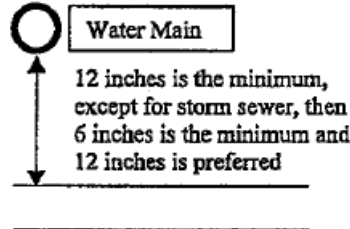
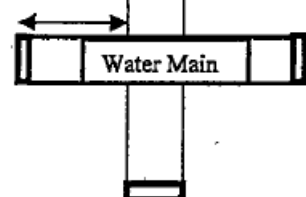
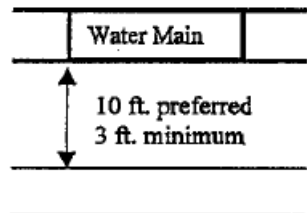
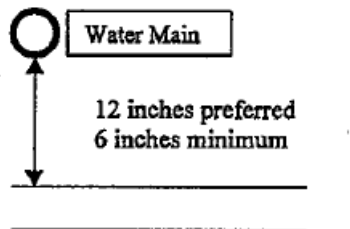
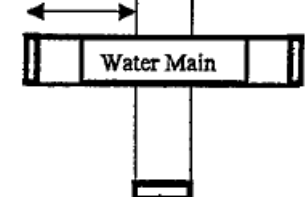
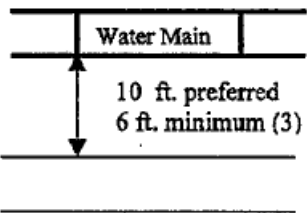
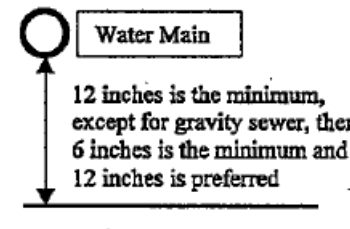
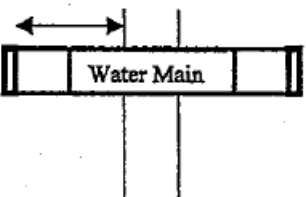
Copies of satisfactory bacteriological analysis (a.k.a. Main Clearance), taken within sixty (60) days of completion of construction, from locations within the distribution system or water main extension to be cleared, in accordance with Rules 62-555.315(6), 62-555.340, and 62-555.330, F.A.C. and American Water Works Association (AWWA) Standard C 651-92, as follows:

- *The endpoint of the proposed addition;*
- *Any water lines branching off a main extension;*
- *Every 1,200 feet of water main;*
- *Each location shall be sampled on two separate days (at least 6 hours apart) with sample point locations and chlorine residual readings clearly indicated on the report and/or drawings.*
- *Bacteriological sample results will be considered unacceptable if the tests were completed more than 60 days before the Department receives the results.*

4) Pressure Test Results

Copy of satisfactory pressure test results demonstrating compliance with AWWA Standard requirements.

LOCATION OF PUBLIC WATER SYSTEMS MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			
Vacuum Sanitary Sewer			
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

- (1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.
 (2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.
 (3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.
 (4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

Disclaimer -- This document is provided for your convenience only. Please refer to F.A.C. Rule 62-555.314 for additional construction requirements.



**FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION**

BOB MARTINEZ CENTER
2600 BLAIRSTONE ROAD, Mail Station 3522
TALLAHASSEE, FLORIDA 32399-2400

RICK SCOTT
GOVERNOR

CARLOS LOPEZ-CANTERA
LT. GOVERNOR

HERSCHEL T. VINYARD
JR.
SECRETARY

May 5, 2014

Town of Longboat Key
c/o Juan J. Florensa
600 General Harris Street
Longboat Key, Florida 34228

Dear Mrs. Florensa:

Correction of Permit

Permit Number: ME-1092 (Corrected)

Permittee Name: Town of Longboat Key

The permit mailed to you on June 7, 2013, contained errors. The corrected permit is enclosed. Please keep a copy of this letter on the site along with the corrected permit for the entire period of construction. All requirements and conditions of the permit remain in effect.

If you have any questions pertaining to this permit, please contact me by mail at the letterhead address, by telephone at (850) 245-7674, or by e-mail at muthuswamy.subbuswamy@dep.state.fl.us.

Sincerely,

S. Muthuswamy, Ph.D., Engineer
Coastal Construction Control Line Program
Division of Water Resource Management

SM/dw

Enclosure

cc: Permit Information Center
Steve West, Field Inspector
Town of Bradenton Beach, Building Official
Town of Longboat Key, Property Owner



STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Water Resource Management
2600 Blair Stone Road - Mail Station 3522
Tallahassee, Florida 32399-2400
(850) 245-8336

PERMIT NUMBER: ME-1092 (Corrected)

PERMITTEE

Town of Longboat Key
c/o Juan J. Florensa
600 General Harris Street
Longboat Key Florida 34228

NOTICE TO PROCEED AND CORRECTED PERMIT FOR CONSTRUCTION OR OTHER
ACTIVITIES PURSUANT TO SECTION 161.053, FLORIDA STATUTES

FINDINGS OF FACT: An application for authorization to conduct the activities seaward of the coastal construction control line was approved by the Department of Environmental Protection on March 18, 2013, and was determined to be complete pursuant to rule on March 18, 2013. Subsequent to issuance of the permit, the Department staff identified certain items within the permit which needed corrections.

CONCLUSIONS OF LAW: After considering the merits of the proposal and any written objections from affected persons, the Department finds that upon compliance with the permit conditions, the activities indicated in the project description of this corrected permit are of such a nature that they will result in no significant adverse impacts to the beach/dune areas or to adjacent properties; that the work is not expected to adversely impact nesting sea turtles, their hatchlings, or their habitat; that the work is expendable in nature and/or is appropriately designed in accordance with Section 62B-33.005, Florida Administrative Code. Based on the foregoing considerations, the Department approves the application; authorizes construction and/or activities at the location indicated below in strict accordance with the project description, the approved plans (if any) and the General Permit Conditions which are attached and are by this reference incorporated herein, and any additional conditions shown below, pursuant to Section 161.053(4), Florida Statutes.

EXPIRATION DATE: June 7, ~~2014~~2016

LOCATION: Between approximately 126 feet south and 575 feet north of the Department of Environmental Protection's reference monument R-41, in Manatee County. Project address: 2651 Gulf Drive South, Bradenton Beach.

PROJECT DESCRIPTION:

The applicant/permittee is authorized installation of a 16-inch water main for a length of 575 feet by open-cut excavation with in an existing shell drive way and 126 feet by horizontal directional drilling method. The installation varies from a minimum 39 feet to a maximum 118 feet seaward of the coastal construction control line. The excavation will be approximately 331.3 cubic yards and the excavated material will be used as fill to close the existing shell drive way.

PERMITTEE: Town of Longboat Key
PERMIT NUMBER: ME-1092 (Corrected)
PAGE 2

SPECIAL PERMIT CONDITIONS:

1. Prior to commencement of construction activity authorized by this permit, a preconstruction conference shall be held at the site among the contractor, the owner or authorized agent, and a staff representative of the Department to establish an understanding among the parties as to the items specified in the special and general conditions of the permit. The proposed locations of the structures shall be staked out for the conference. **Contact Steve West at (850) 488-7708 to schedule a conference.**
2. All imported fill material shall be obtained from a source landward of the control line and shall consist of sand which is similar to that already on the site in both grain size and coloration. This fill material shall be free of construction debris, rocks, or other foreign matter. A sample of the sand shall be provided to the staff representative of the Department during the preconstruction conference.
3. No lighting is authorized.

This corrected permit, with the referenced attachments, comprises the entire permit, and supersedes the permit as previously issued.

Approved plans are incorporated into this permit by reference.

Done and ordered this 1st day of May, 2014, in Tallahassee, Florida.

Attachment: General Permit Conditions

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to S120.52
Florida Statutes, with the designated
Department Clerk, receipt of which is
hereby acknowledged.

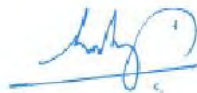


Deputy Clerk

05/01/2014

Date

State of Florida Department of Environmental
Protection



S. Muthuswamy, Ph.D., Engineer
Coastal Construction Control Line Program
Division of Water Resource Management

NOTICE OF RIGHTS

This action is final and effective on the date filed with the Clerk of the Department unless a petition for an administrative hearing is timely filed under sections 120.569 and 120.57, Florida Statutes, before the deadline for filing a petition. On the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. Because the administrative hearing process is designed to formulate final agency action, the hearing process may result in a modification of the agency action or even denial of the application.

Petition for Administrative Hearing

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57, Florida Statutes. Pursuant to rule 28-106.201, Florida Administrative Code, a petition for an administrative hearing must contain the following information:

- (a) The name and address of each agency affected and each agency's file or identification number, if known;
- (b) The name, address, any e-mail address, any facsimile number, and telephone number of the petitioner, if the petitioner is not represented by an attorney or a qualified representative; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination;
- (c) A statement of when and how the petitioner received notice of the agency decision;
- (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
- (e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;
- (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
- (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed **(received by the Clerk)** in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000. Also, a copy of the petition shall be mailed to the applicant at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with rule 62-110.106(3), Florida Administrative Code, petitions for an administrative hearing by the applicant must be filed within 21 days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under section 120.60(3), Florida Statutes, must be filed within 21 days of publication of the notice or within 21 days of receipt of the written notice, whichever occurs first. Under section 120.60(3), Florida Statutes, however, any person who has asked the Department for notice of agency action may file a petition within 21 days of receipt of such notice,

regardless of the date of publication. The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57, Florida Statutes, or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with rule 28-106.205, Florida Administrative Code.

Extension of Time

Under rule 62-110.106(4), Florida Administrative Code, a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, before the applicable deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

Mediation is not available in this proceeding.

Judicial Review

Once this decision becomes final, any party to this action has the right to seek judicial review pursuant to section 120.68, Florida Statutes, by filing a Notice of Appeal pursuant to rules 9.110 and 9.190, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, M.S. 35, Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this action is filed with the Clerk of the Department.

The Agency will not publish or require the person requesting a permit to publish in a newspaper a notice of receipt of the permit application or notice of Agency action granting or denying the permit.

Persons receiving a permit are advised that interested parties who become aware of Agency action approving or denying the permit, or who observe work on the project within certain time frames without any prior notice, may have rights to petition for an administrative hearing under Chapter 120, F.S. For this reason, it may be in the best interest of the person proposing the activity to publish, at its expense, a one-time "Notice of Permit Issuance" in a newspaper of general circulation in the county where the activity is located meeting the requirements of Chapter 50, F.S. Agency staff can provide persons with the information for such a notice upon request. Persons who are substantially affected by the proposed action may petition for an administrative hearing within the time frames specified in the notice and Chapter 120, F.S.



FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

3900 Commonwealth Blvd., Mail Station 300
Tallahassee, Florida 32399-3000
Telephone (850) 488-7708

NOTICE TO PROCEED

Permittee Name:

Town of Longboat Key
c/o Juan J. Florensa
600 General Harris Street
Longboat Key Florida 34228

**Permit Number:** ME-1092**Permit Expires:** June 7, 2014

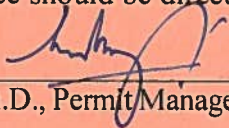
You are hereby granted final authorization to proceed with construction or activities authorized by this notice. Authorized work must conform to the project description, approved plans, all conditions of Chapter 62B-33, Florida Administrative Code, any preconstruction requirements, and all permit conditions.

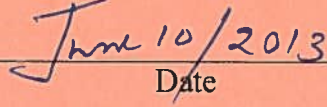
Project Description: The applicant/permittee is authorized installation of a 16-inch water main for a length of 575 feet by open-cut excavation with in an existing shell drive way and 126 feet by horizontal directional drilling method. The installation varies from a minimum 39 feet to a maximum 118 feet seaward of the coastal construction control line. The excavation will be approximately 331.3 cubic yards and the excavated material will be used as fill to close the existing shell drive way.

Project Location: Between approximately 126 feet south and 575 feet north of the Department of Environmental Protection's reference monument R-41, in Manatee County. Project address: 2651 Gulf Drive South, Bradenton Beach.

Special Instructions: A preconstruction conference is required. The permittee shall comply with all permit conditions.

Questions regarding this notice should be directed to the undersigned at the above address.


Muthuswamy Subbuswamy, Ph.D., Permit Manager


Date

MS/aa

cc: Permit File
Permit Information Center
Steve West, Field Inspector
Town of Longboat Key, Property Owner
City of Bradenton, Building Official

Post Conspicuously on the Site



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Herschel T. Vinyard, Jr.
Secretary

June 10, 2013

Town of Longboat Key
c/o Juan J. Florensa
600 General Harris Street
Longboat Key Florida 34228



Dear Mr. Florensa:

Notice to Proceed Issued

Permit Number: **ME-1092**

Permittee Name: **Town of Longboat Key**

Your request for a permit pursuant to Section 161.053, Florida Statutes, for construction or other activities seaward of the coastal construction control line, has been approved by the Department of Environmental Protection, enclosed is the permit. However, construction may not commence until after the permittee complies with any preconstruction requirements described in Special Permit Condition 1.

The permit will expire one (1) year after the date of issuance of the permit. Upon receipt of a written request signed by the permittee or authorized agent, the Department will consider extending the permit for up to but no more than one additional year. You must apply for a new permit for completion of any work not accomplished under the original permit. Although you may apply for a new permit, there is no assurance that such new permit for the same construction or activities would be approved.

NOTICE OF RIGHTS

This action is final and effective on the date filed with the Clerk of the Department unless a petition for an administrative hearing is timely filed under sections 120.569 and 120.57, Florida Statutes, before the deadline for filing a petition. On the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. Because the administrative hearing process is designed to formulate final agency action, the hearing process may result in a modification of the agency action or even denial of the application.

Petition for Administrative Hearing

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57, Florida Statutes. Pursuant to rule 28-106.201, Florida Administrative Code, a petition for an administrative hearing must contain the following information:

- (a) The name and address of each agency affected and each agency's file or identification number, if known;
- (b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes

during the course of the proceeding; and an explanation of how the petitioner's substantial interests are or will be affected by the agency determination;

- (c) A statement of when and how the petitioner received notice of the agency decision;
- (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
- (e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;
- (f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
- (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (**received by the Clerk**) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000. Also, a copy of the petition shall be mailed to the applicant at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with rule 62-110.106(3), Florida Administrative Code, petitions for an administrative hearing by the applicant must be filed within 21 days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under section 120.60(3), Florida Statutes, must be filed within 21 days of publication of the notice or within 21 days of receipt of the written notice, whichever occurs first. Under section 120.60(3), Florida Statutes, however, any person who has asked the Department for notice of agency action may file a petition within 21 days of receipt of such notice, regardless of the date of publication. The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57, Florida Statutes, or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with rule 28-106.205, Florida Administrative Code.

Extension of Time

Under rule 62-110.106(4), Florida Administrative Code, a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, before the applicable deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

Mediation is not available in this proceeding.

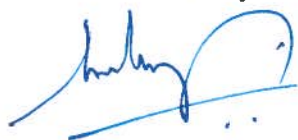
Juan J. Florensa
June 10, 2013
Page Three

Judicial Review

Once this decision becomes final, any party to this action has the right to seek judicial review pursuant to section 120.68, Florida Statutes, by filing a Notice of Appeal pursuant to rules 9.110 and 9.190, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, M.S. 35, Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this action is filed with the Clerk of the Department.

The authorized work is strictly limited to that described on the enclosed permit. If you have any questions pertaining to this permit, please contact me by mail at the letterhead address (add Mail Station 300), by telephone at 850.921.7821, or by email at Muthuswamy.Subbuswamy@dep.state.fl.us.

Sincerely,



Muthuswamy Subbuswamy, Ph.D., Permit Manager
Coastal Construction Control Line Program
Division of Water Resource Management

MS/aa

Enclosures

cc: Permit File
Permit Information Center
Steve West, Field Inspector
Town of Longboat Key, Property Owner
City of Bradenton, Building Official



STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Water Resource Management
3900 Commonwealth Blvd. - Mail Station 300
Tallahassee, Florida 32399-3000
(850) 488-7708

PERMIT NUMBER: ME-1092

PERMITTEE

Town of Longboat Key
c/o Juan J. Florensa
600 General Harris Street
Longboat Key Florida 34228

PERMIT FOR CONSTRUCTION OR OTHER ACTIVITIES
PURSUANT TO SECTION 161.053, FLORIDA STATUTES

FINDINGS OF FACT: An application for authorization to conduct the activities seaward of the coastal construction control line that are indicated in the project description, was filed by the applicant/permittee named herein on March 18, 2013, and was determined to be complete pursuant to rule on March 18, 2013.

CONCLUSIONS OF LAW: After considering the merits of the proposal and any written objections from affected persons, the Department finds that upon compliance with the permit conditions, the activities indicated in the project description of this permit are of such a nature that they will result in no significant adverse impacts to the beach/dune areas or to adjacent properties; that the work is not expected to adversely impact nesting sea turtles, their hatchlings, or their habitat; that the work is expendable in nature and/or is appropriately designed in accordance with Section 62B-33.005, Florida Administrative Code. Based on the foregoing considerations, the Department approves the application; authorizes construction and/or activities at the location indicated below in strict accordance with the project description, the approved plans (if any) and the General Permit Conditions which are attached and are by this reference incorporated herein, and any additional conditions shown below, pursuant to Section 161.053(4), Florida Statutes.

EXPIRATION DATE: June 7, 2014

LOCATION: Between approximately 126 feet south and 575 feet north of the Department of Environmental Protection's reference monument R-41, in Manatee County. Project address: 2651 Gulf Drive South, Bradenton Beach.

PROJECT DESCRIPTION:

The applicant/permittee is authorized installation of a 16-inch water main for a length of 575 feet by open-cut excavation with in an existing shell drive way and 126 feet by horizontal directional drilling method. The installation varies from a minimum 39 feet to a maximum 118 feet seaward of the coastal construction control line. The excavation will be approximately 331.3 cubic yards and the excavated material will be used as fill to close the existing shell drive way.

PERMITTEE: Town of Longboat Key
PERMIT NUMBER: ME-1092
PAGE 2

SPECIAL PERMIT CONDITIONS:

1. Prior to commencement of construction activity authorized by this permit, a preconstruction conference shall be held at the site among the contractor, the owner or authorized agent, and a staff representative of the Department to establish an understanding among the parties as to the items specified in the special and general conditions of the permit. The proposed locations of the structures shall be staked out for the conference. **Contact Steve West at (850) 488-7708 to schedule a conference.**
2. All imported fill material shall be obtained from a source landward of the control line and shall consist of sand which is similar to that already on the site in both grain size and coloration. This fill material shall be free of construction debris, rocks, or other foreign matter. A sample of the sand shall be provided to the staff representative of the Department during the preconstruction conference.
3. No lighting is authorized.

Approved plans are incorporated into this permit by reference.

Done and ordered this 7th day of June 2013, in Tallahassee, Florida.

Attachment: General Permit Conditions

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to S120.52
Florida Statutes, with the designated
Department Clerk, receipt of which is
hereby acknowledged.

Pella Weaver 6/7/2013
Deputy Clerk Date

State of Florida
Department of Environmental Protection


S. Muthuswamy, Ph.D., Engineer
Coastal Construction Control Line Program
Division of Water Resource Management



General Permit Conditions

Rule 62B-33.0155, Florida Administrative Code

- 1 The following general permit conditions shall apply, unless waived by the Department or modified by the permit:
 - a) The permittee shall carry out the construction or activity for which the permit was granted in accordance with the plans and specifications that were approved by the Department as part of the permit. Deviations therefrom, without written approval from the Department, shall be grounds for suspension of the work and revocation of the permit pursuant to Section 120.60(7), F.S., and shall result in assessment of civil fines or issuance of an order to alter or remove the unauthorized work, or both. No other construction or activities shall be conducted. No modifications to project size, location, or structural design are authorized without prior written approval from the Department. A copy of the notice to proceed shall be conspicuously displayed at the project site. Approved plans shall be made available for inspection by a Department representative.
 - b) The permittee shall conduct the construction or activity authorized under the permit using extreme care to prevent any adverse impacts to the beach and dune system, marine turtles, their nests and habitat, or adjacent property and structures.
 - c) The permittee shall allow any duly identified and authorized member of the Department to enter upon the premises associated with the project authorized by the permit for the purpose of ascertaining compliance with the terms of the permit and with the rules of the Department until all construction or activities authorized or required in the permit have been completed and all project performance reports, certifications, or other documents are received by the Department and determined to be consistent with the permit and approved plans.
 - d) The permittee shall hold and save the State of Florida, the Department, and its officers and employees harmless from any damage, no matter how occasioned and no matter what the amount, to persons or property that might result from the construction or activity authorized under the permit and from any and all claims and judgments resulting from such damage.
 - e) The permittee shall allow the Department to use all records, notes, monitoring data, and other information relating to construction or any activity under the permit, which are submitted, for any purpose necessary except where such use is otherwise specifically forbidden by law.
 - f) Construction traffic shall not occur and building materials shall not be stored on vegetated areas seaward of the control line unless specifically authorized by the permit. If the Department determines that this requirement is not being met, positive control measures, such as temporary fencing, designated access roads, adjustment of construction sequence, or other requirements, shall be provided by the permittee at the direction of the Department. Temporary construction fencing shall not be sited within marine turtle nesting habitats.
 - g) The permittee shall not disturb existing beach and dune topography and vegetation except as expressly authorized in the permit. Before the project is considered complete, any disturbed topography or vegetation shall be restored as prescribed in the permit with suitable fill material or revegetated with appropriate beach and dune vegetation.
 - h) All fill material placed seaward of the control line shall be sand which is similar to that already existing on the site in both coloration and grain size. All such fill material shall be free of construction debris, rocks, clay, or other foreign matter; shall be obtained from a source landward of the coastal construction control line; and shall be free of coarse gravel or cobbles.
 - i) If surplus sand fill results from any approved excavation seaward of the control line, such material shall be distributed seaward of the control line on the site, as directed by the Department, unless otherwise specifically authorized by the permit.
 - j) Any native salt-tolerant vegetation destroyed during construction shall be replaced with plants of the same species or, by authorization of the Department, with other native salt-tolerant vegetation suitable for beach and dune stabilization. Unless otherwise specifically authorized by the Department, all plants installed in beach and coastal areas – whether to replace vegetation displaced, damaged, or destroyed during construction or otherwise – shall be of species indigenous to Florida beaches and dunes, such as sea oats, sea grape, saw palmetto, panic grass, saltmeadow hay cordgrass, seashore saltgrass, and railroad vine, and grown from stock indigenous to the region in which the project is located.
 - k) All topographic restoration and revegetation work is subject to approval by the Department, and the status of restoration shall be reported as part of the final certification of the actual work performed.
 - l) If not specifically authorized elsewhere in the permit, no operation, transportation, or storage of equipment or materials is authorized seaward of the dune crest or rigid coastal structure during the marine turtle nesting season. The marine turtle nesting season is May 1 through October 31 in all counties except Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward counties where leatherback turtle nesting occurs during the period of March 1 through October 31.
 - m) If not specifically authorized elsewhere in the permit, no temporary lighting of the construction area is authorized at any time during the marine turtle nesting season and no additional permanent exterior lighting is authorized.

- n) All windows and glass doors visible from any point on the beach must be tinted to a transmittance value (light transmission from inside to outside) of 45% or less through the use of tinted glass or window film.
 - o) The permit has been issued to a specified property owner and is not valid for any other person unless formally transferred. An applicant requesting transfer of the permit shall sign two copies of the permit transfer agreement form, agreeing to comply with all terms and conditions of the permit, and return both copies to the Bureau. The transfer request shall be provided on the form entitled "Permit Transfer Agreement" - DEP Form 73-103 (Revised 1/04), which is hereby adopted and incorporated by reference. No work shall proceed under the permit until the new owner has received a copy of the transfer agreement approved by the Department. A copy of the transfer agreement shall be displayed on the construction site along with the permit. An expired permit shall not be transferred.
 - p) The permittee shall immediately inform the Bureau of any change of mailing address of the permittee and any authorized agent until all requirements of the permit are met.
 - q) For permits involving major structures or activities, the permittee shall submit to the Bureau periodic progress reports on a monthly basis beginning at the start of construction and continuing until all work has been completed. If a permit involves either new armoring or major reconstruction of existing armoring, the reports shall be certified by an engineer licensed in the State of Florida. The permittee or engineer, as appropriate, shall certify that as of the date of each report all construction has been performed in compliance with the plans and project description approved as a part of the permit and with all conditions of the permit, or shall specify any deviation from the plans, project description, or conditions of the permit. The report shall also state the percent of completion of the project and each major individual component. The reports shall be provided to the Bureau using the form entitled "Periodic Progress Report" - DEP Form 73-111 (Revised 6/04), which is hereby adopted and incorporated by reference. Permits for minor structures or activities do not require submittal of periodic reports unless required by special permit condition.
 - r) For permits involving habitable major structures, all construction on the permitted structure shall stop when the foundation pilings have been installed. At that time the foundation location form shall be submitted to and accepted by the Bureau prior to proceeding with further vertical construction above the foundation. The form shall be signed by a professional surveyor, licensed pursuant to Chapter 472, F.S., and shall be based upon such surveys performed in accordance with Chapter 472, F.S., as are necessary to determine the actual configuration and dimensioned relationship of the installed pilings to the control line. The information shall be provided to the Bureau using the form entitled "Foundation Location Certification" - DEP Form 73-114B (Revised 9/05), which is hereby adopted and incorporated by reference. Phasing of foundation certifications is acceptable. The Department shall notify the permittee of approval or rejection of the form within seven (7) working days after staff receipt of the form. All survey information upon which the form is based shall be made available to the Bureau upon request. Permits for repairs or additions to existing structures with nonconforming foundations are exempt from this condition.
 - s) For permits involving major structures, the permittee shall provide the Bureau with a report by an engineer or architect licensed in the State of Florida within thirty (30) days following completion of the work. The report shall state that all locations specified by the permit have been verified and that other construction and activities authorized by the permit have been performed in compliance with the plans and project description approved as a part of the permit and all conditions of the permit; or shall describe any deviations from the approved plans, project description, or permit conditions, and any work not performed. Such report shall not relieve the permittee of the provisions of paragraph 62B-33.0155(1)(a), F.A.C. If none of the permitted work is performed, the permittee shall inform the Bureau in writing no later than 30 days following expiration of the permit. The report shall be provided on the form entitled "Final Certification" DEP Form 73-115B (Revised 9/05), which is hereby adopted and incorporated by reference.
 - t) Authorization for construction of armoring or other rigid coastal structures is based on an engineering review and assessment of the design and anticipated performance and impact of the structure as a complete unit. Construction of any less than the complete structure as approved by the Department is not authorized and shall result in the assessment of an administrative fine and the issuance of an order to remove the partially constructed structure. Modifications to the project size, location, or structural design shall be authorized by the Department in accordance with Rule 62B-33.013, F.A.C.
- 2 The permittee shall not commence any excavation, construction, or other physical activity on or encroaching on the sovereignty land of Florida seaward of the mean high water line or, if established, the erosion control line until the permittee has received from the Board of Trustees of the Internal Improvement Trust Fund the required lease, license, easement, or other form of consent authorizing the proposed use.
 - 3 The permittee shall obtain any applicable licenses or permits required by Federal, state, county, or municipal law.
 - 4 This permit does not authorize trespass onto other property.
 - 5 In the event of a conflict between a general permit condition and a special permit condition, the special permit condition shall prevail.
 - 6 Copies of any forms referenced above can be obtained by writing to the Department of Environmental Protection, Bureau of Beaches and Coastal Systems, 3900 Commonwealth Boulevard, Mail Station 300, Tallahassee, Florida 32399-3000, or by telephoning (850) 488-7708.

From: [Davis, Luke](#)
To: [Lowe, Karen](#)
Cc: Muthuswamy.Subbuswamy@dep.state.fl.us
Subject: RE: Longboat Pass Water Main
Date: Friday, September 06, 2013 4:02:23 PM

We do not object to this request, provided the following recommendations are met in accordance with Florida Statute 379.2431 (1).

1. Upon documentation of any marine turtle emergences in the project or access area, all construction activity shall cease and the permittee shall contact the Imperiled Species Management Section (850-922-4330) immediately to determine if construction activity may continue. If approved to continue work, no construction activities shall enter the circle marking the nest and no adjacent construction shall be allowed that might directly or indirectly disturb the area within the staked circle. Please contact Ms. Kristen Mazarella at MOTE (941-388-4441) prior to any construction activities to ensure surveys are completed each morning.
 - a. No construction activity may commence until completion of the marine turtle survey each day.
 - b. It is the responsibility of the permittee to ensure that the project area and access sites are surveyed for marine turtle nesting activity. All nesting surveys, nest relocations screening or caging activities etc. shall be conducted only by persons with prior experience and training in these activities and who is duly authorized to conduct such activities through a valid permit issued by the Fish and Wildlife Conservation Commission (FWC), pursuant to Florida Administrative Code 68E-1.
2. Any temporary minor disturbances in the sand (including ruts, depressions, holes, or mounds) shall be filled in and raked smooth with hand tools each evening.
3. Construction lighting shall be limited to the immediate construction area during the marine turtle nesting season and shall comply with safety requirements. Lighting on in-water or onshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the water's surface and the marine turtle nesting beach while meeting all Coast Guard, EM 385-1-1, and OSHA requirements. Light intensity of lighting equipment shall be reduced to the minimum standard required by OSHA for General Construction areas. Shields shall be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the construction area.

Thank you for the opportunity to review this project. Please contact me at (850) 922-4330 or via e-mail if you have questions or require additional information.

Sincerely,

Lucas Davis, Planner II
Fish & Wildlife Conservation Commission
Imperiled Species Management Section
620 S. Meridian Street MS-6A

Tallahassee, FL 32399
850-922-4330 office
850-922-6988 fax

From: Peter Plage [mailto:peter_plage@fws.gov]
Sent: Thursday, September 05, 2013 4:48 PM
To: Davis, Luke
Cc: LoweKS@cdmsmith.com; Teresa Calleson
Subject: Longboat Pass Water Main

Luke,

I spoke today with Karen Lowe of CDM Smith regarding a proposed project by the Town of Longboat Key that would include directional drilling for a 16-inch diameter water line under Longboat Pass (FDEP Permit ME-1092).

A concern arose that the FDEP permit prohibits nighttime lighting, though the nature of the project will require round-the-clock work on a single occasion for directional drilling lasting from 24 to 48 hours. The nighttime lighting restriction was apparently included as a precaution so that nesting sea turtles would not be impacted. The construction site is east of the Longboat Pass bridge, so while lights on the site might be seen from the pass, it is unlikely that they would illuminate or be seen from Gulf beaches.

Given the above and upon reviewing the materials that Ms. Lowe forwarded, I find the proposed project deals adequately with the potential issue of nighttime lighting and would likely preclude any adverse impacts to nesting or hatching sea turtles.

Specifically, the contractor would be required to abide by the following:

1. The CONTRACTOR shall be responsible for compliance with all permit requirements/guidelines for protection of marine turtles during turtle nesting season (May 1 - October 31). If any turtle interaction is required, the designated FWC Turtle Permit Holder for Manatee County, Ms. Susie Fox, shall be contacted.
2. If permitted, lighting on offshore or onshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the water's surface and nesting beach while meeting all Coast Guard, EM 385-1-1, and OSHA requirements. Light intensity shall be reduced to the minimum standard required by OSHA for General Construction areas, in order not to misdirect sea turtles. Shields shall be affixed to the light housing and be large enough to block light from all lamps

from being transmitted outside the construction area.

Illustrations included were generic, but it is understood any required lighting would be minimized and shielded as necessary. Ms. Lowe also included the Town's lighting ordinance. (*Ord. 87-16, passed 6-1-87; Am. Ord. 92-32, passed 1-4-93*) In part it reads:

100.03 - New development; requirements; prohibitions.

It is the policy of the town commission that no artificial light illuminate any area of the gulf beaches of the town. To meet this intent, building and electrical plans for construction of single-family or multifamily dwellings, commercial or other structures, including electrical plans associated with parking lots, dune walkovers or other outdoor lighting for real property if lighting associated with such construction or development can be seen from the beach, shall be in compliance with the following:

Direct illumination of the beach shall be prohibited.

Wall-mounted light fixtures shall be fitted with hoods so that no light illuminates the beach.

Pole lighting shall be shielded in such a way that light will be contained within an arc of three to 73 degrees on the seaward side of the pole

Outdoor lighting shall be held to the minimum necessary for security and convenience.

Lights on balconies shall be fitted with hoods or shades so that lights will not illuminate the beach.

Temporary security lights at construction sites shall not be mounted more than 15 feet above the ground. Illumination from the lights shall not spread beyond the boundary of the property being developed, and in no case shall those lights illuminate the beach.

Low-profile luminaries shall be used in parking lots, and such lighting shall be positioned so that no light illuminates the beach.

Dune crosswalks shall utilize low-profile shielded luminaries.

I trust this email is sufficient for you to recommend revision of the FDEP permit for this specific nighttime lighting exception. Let me know if you have questions or concerns.

Peter Plage

U.S. Fish and Wildlife Service

600 Fourth Street South

St. Petersburg, FL 33701

904-731-3085

727-803-8747, ex. 3107 (Office)

www.fws.gov/northflorida

Tallahassee, FL 32399
850-922-4330 office
850-922-6988 fax

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Sent: Thursday, September 05, 2013 4:48 PM
To: Davis, Luke
Cc: LoweKS@cdmsmith.com; Teresa Calleson
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Peter Plage

U.S. Fish and Wildlife Service

600 Fourth Street South
St. Petersburg, FL 33701

904-731-3085

727-803-8747, ex. 3107 (Office)

www.fws.gov/northflorida

PERMIT VOID UNLESS DOT OPERATIONS
CENTER IS NOTIFIED 48 HRS IN
ADVANCE OF STARTING WORK
PHONE (941) 359-7300
VERIFICATION NO.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

UTILITY PERMIT

ALL CONTRACTORS AND
SUBCONTRACTORS SHALL
BE RESPONSIBLE FOR
COMPLIANCE WITH
PERMITTED M O
PLAN.

710-010-85
UTILITIES
JOGC - 08/10

PERMIT NO.: 2014-H-194-70		SECTION NO.: 13080		STATE ROAD 789		COUNTY Manatee	
FDOT construction is proposed or underway.				☐ Yes		☒ No	
Is this work related to an approved Utility Work Schedule?				☐ Yes		☒ No	
PERMITTEE: Town of Longboat Key				Financial Project ID:			
ADDRESS: 600 General Harris Street				TELEPHONE NUMBER: (941) 316 - 1988			
CITY/STATE/ZIP: Longboat Key, FL 34228							
The above PERMITTEE requests permission from the State of Florida Department of Transportation, hereinafter called the FDOT, to construct, operate and maintain the following: The proposed "Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls" project includes a 16-inch potable water main replacement starting on the north side of Longboat Pass within the Coquina Beach Park, cross under Longboat Pass using horizontal directional drilling technology, and tie into the existing water main on the south side of Longboat Pass. Also included is construction of a new 6-inch water main with service connections along SR 789 to allow for all water services to be connected downstream of the PRS.							
FROM: M.P. 4.436				TO: M.P. 5.071			
Submitted for the PERMITTEE by:		Contact Information		Signature		Date	
Name and Company (Typed or Printed Legibly)		Address/Telephone/E-Mail (if applicable)					
Karen Lowe, CDM Smith		1715 N Westshore Blvd, Ste 875, Tampa, FL 33607 / 813-262-8886 / loweks@cdmsmith.com				5/6/2014	

- The Permittee declares that prior to filing this application, the location of all existing utilities that it owns or has an interest in, both aerial and underground, are accurately shown on the plans and a letter of notification was mailed on November 14, 2012 to the following utilities known to be involved or potentially impacted in the area of the proposed installation:
Florida Power & Light, TECO Peoples Gas, Verizon, Comcast and Manatee County Utilities
- The local Maintenance or Resident Engineer, hereafter referred to as the FDOT Engineer, shall be notified a minimum of forty eight (48) hours in advance prior to starting work and again immediately upon completion of work. The FDOT's Engineer is Albert Rosenstein, P.E. located at FDOT Sarasota Operations Center, Telephone Number 941-359-7300.
The Permittee's employee responsible for MOT is _____ Telephone Number _____ (This name may be provided at the time of the forty eight (48) hour advance-notice prior to starting work).
- All work, materials, and equipment shall be subject to inspection and approval by the FDOT Engineer.
- All plans and installations shall conform to the requirements of the FDOT's UAM in effect as of the date this permit is approved by FDOT, and shall be made a part of this permit. This provision shall not limit the authority of the FDOT under Paragraph 8 of this Permit.
- This Permittee shall commence actual construction in good faith within 90 days after issuance of permit, and shall be completed within 365 days after the permitted work has begun. If the beginning date is more than sixty (60) days from the date of permit approval, the Permittee must review the permit with the FDOT Engineer to make sure no changes have occurred to the Transportation Facility that would affect the permitted construction.
- The construction and maintenance of such utility shall not interfere with the property and rights of a prior Permittee.
- It is expressly stipulated that this permit is a license for permissive use only and that the placing of utilities upon public property pursuant to this permit shall not operate to create or vest any property right in said holder, except as provided in executed subordination and Railroad Utility Agreements.
- Pursuant to Section 337.403, Florida Statutes, any utility placed upon, under, over, or along any public road or publicly owned rail corridor that is found by FDOT to be unreasonably interfering in any way with the convenient, safe, or continuous use, or maintenance, improvement, extension, or expansion, of such public road or publicly owned rail corridor shall, upon thirty (30) days written notice to the utility or its agent by FDOT, be removed or relocated by such utility at its own expense except as provided in Section 337.403(1), Florida Statutes, and except for reimbursement rights set forth in previously executed subordination and Railroad Utility Agreements, and shall apply to all successors and assigns for the permitted facility.
- It is agreed that in the event the relocation of said utilities are scheduled to be done simultaneously with the FDOT's construction work, the Permittee will coordinate with the FDOT before proceeding and shall cooperate with the FDOT's contractor to arrange the sequence of work so as not to delay the work of the FDOT's contractor, defend any legal claims of the FDOT's contractor due to delays caused by the Permittee's failure to comply with the approved schedule, and shall comply with all provisions of the law and the FDOT's current UAM. The Permittee shall not be responsible for delay beyond its control.
- In the case of non-compliance with the FDOT's requirements in effect as of the date this permit is approved, this permit is void and the facility will have to be brought into compliance or removed from the R/W at no cost to the FDOT, except for reimbursement rights set forth in previously executed subordination and Railroad Utility Agreements. This provision shall not limit the authority of the FDOT under Paragraph 8 of this Permit.
- It is understood and agreed that the rights and privileges herein set out are granted only to the extent of the State's right, title and interest in the land to be entered upon and used by the Permittee, and the Permittee will, at all times, and to the extent permitted by law, assume all risk of and indemnify, defend, and save harmless the State of Florida and the FDOT from and against any and all loss, damage, cost or expense arising in any manner on account of the exercise or attempted exercises by said Permittee of the aforesaid rights and privileges.
- During construction, all safety regulations of the FDOT shall be observed and the Permittee must take measures, including placing and the display of safety devices that may be necessary in order to safely conduct the public through the project area in accordance with the Federal MUTCD, as amended by the UAM.
- Should the Permittee be desirous of keeping its utilities in place and out of service, the Permittee, by execution of this permit acknowledges its present and continuing ownership of its utilities located between Not Applicable - utilities will remain in-service and _____ within the FDOT's R/W as set forth above. Whenever the Permittee removes its facilities, it shall be at the Permittee's sole cost and expense. The Permittee, at its sole expense, shall promptly remove said out of service utilities whenever the FDOT determines said removal is in the public interest.
- In the event contaminated soil is encountered by the Permittee or anyone within the permitted construction limits, the Permittee shall immediately cease work and notify the FDOT. The FDOT shall notify the Permittee of any suspension or revocation of the permit to allow contamination assessment and remediation. Said suspension or revocation shall remain in effect until otherwise notified by FDOT.
- For any excavation, construction, maintenance, or support activities performed by or on behalf of the FDOT, within its R/W, the Permittee may be required by

NOTE: ALL ABOVE GROUND
APPURTENANCES ARE TO BE
LOCATED AT R/W LINE.



UTILITY PERMIT

the FDOT or its agents to perform the following activities with respect to a Permittee's facilities: physically expose or direct exposure of underground facilities, provide any necessary support to facilities and/or cover, de-energize or alter aerial facilities as deemed necessary for protection and safety.

16. Pursuant to Section 337.401(2), Florida Statutes, the permit shall require the permit holder to be responsible for damage resulting from the issuance of the permit. The FDOT may initiate injunctive proceedings as provided in s.120.69 to enforce provisions of this subsection or any rule or order issued or entered into pursuant thereto.
17. Pursuant to Section 337.402, Florida Statutes, when any public road or publicly owned rail corridor is damaged or impaired in any way because of the installation, inspection, or repair of a utility located on such road or publicly owned rail corridor, the owner of the utility shall, at his or her own expense, restore the road or publicly owned rail corridor to its original condition before such damage. If the owner fails to make such restoration, the authority is authorized to do so and charge the cost thereof against the owner under the provisions of s.337.404.
18. The Permittee shall comply with all provisions of Chapter 556, Florida Statutes, Underground Facilities Damage Prevention and Safety Act.
19. Special FDOT instructions: This project will require 24-hr construction activities during the directional drill pipe pullback operations. In addition to the construction areas, an approximate 1,300 linear foot pipe layout area adjacent to SR 789 is proposed. This pipe layout area will only be utilized during the pipelay out activities which are estimated to take 3 weeks. An interlocal agreement between the Town of Longboat Key and Manatee County will provide for the permitted use of the temporary pipe layout/construction areas and grant the required permanent easements.

It is understood and agreed that commencement by the Permittee is acknowledgment and acceptance of the binding nature of all the above listed permit conditions and special instructions.

20. By receipt of this permit, the Permittee acknowledges responsibility to comply with Section 119.07, Florida Statutes.
21. By the below signature, the Permittee hereby represents that no change to the FDOT's standard Utility Permit form, as incorporated by reference into Rule 14-46.001, for this Utility Permit has been made which has not been previously called to the attention of the FDOT (and signified to by checking the appropriate box below) by a separate attached written document showing all changes and the written and dated approval of the FDOT Engineer. Are there attachments reflecting change/s to the standard form? ☒ NO ☐ YES If Yes, _____ pages are attached.

PERMITTEE	Juan J. Florensa Public Works Director, Town of Longboat Key	SIGNATURE		DATE:	5/6/2014
	Name & Title of Authorized Permittee or Agent (Typed or Printed Legibly)				
APPROVED BY:				ISSUE DATE:	5-27-14
	District Maintenance Engineer or Designee				

UTILITY PERMIT FINAL INSPECTION CERTIFICATION

DATE:	
DATE WORK STARTED:	
DATE WORK COMPLETED:	
INSPECTED BY:	
(Permittee or Agent)	
CHANGE APPROVED BY:	DATE:
District Maintenance Engineer or Designee	

I the undersigned Permittee do hereby CERTIFY that the utility construction approved by the above numbered permit was inspected and installed in accordance with the approved plans made a part of this permit and in accordance with the FDOT's current UAM. All plan changes have been approved by the FDOT's Engineer and are attached to this permit. I also certify that the work area has been left in as good or better condition than when the work was begun.

PERMITTEE:	SIGNATURE:	DATE:
Name & Title of Authorized Permittee or Agent (Typed or Printed Legibly)		

CC: District Permit Office
Permittee

Special Condition Sheet

1. Lane closures and other work may be restricted by the FDOT due to heavy traffic and potential backups caused by this construction. Night work may be required.
2. IF A LANE CLOSURE IS WITHIN THE PROJECT LIMITS, THE PERMITTEE MUST NOTIFY THE DEPARTMENT 14 DAYS PRIOR TO A LANE CLOSURE TO ALLOW THE DEPARTMENT TO INFORM THE MOTORING PUBLIC.

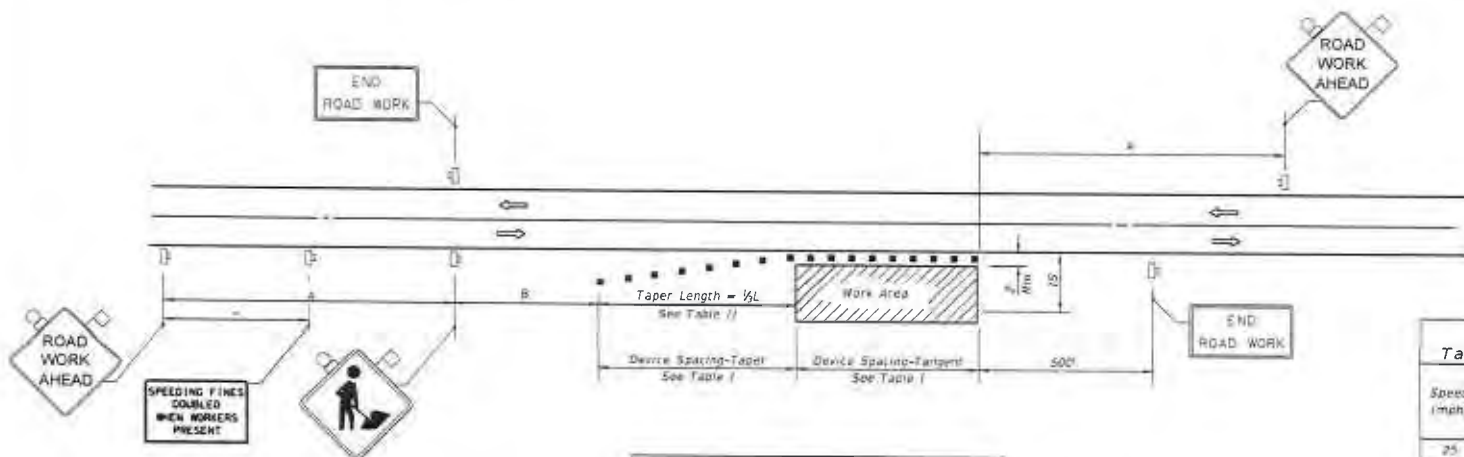
FLORIDA DEPARTMENT OF TRANSPORTATION Stormwater Pollution Control Reminder

- *Stormwater Management*
Contact your local municipality and/or the Southwest Florida Management District.
Bartow (863) 534-1448
Venice (Sarasota) (941) 278-7396
Fort Myers (Sarasota) (941) 278-7396
- Fort Myers is also part of South Florida Water Management District (800) 432-2045.
- *Used Oil recycling*
Contact the Florida Department of Environmental Protection at (813) 744-6100 or your local automotive parts store.
- *Hazardous Waste Disposal*
Contact the Florida Department of Environmental Protection at (813) 744-6100.
- *Spill Reporting*
State Warning Point (800) 320-0519
Federal Response Center (800) 424-8802
- *Pesticides & Fertilizers*
Contact your Local County Agricultural Extension Service.
Charlotte (941) 764-4340
Collier (239) 353-4244
Desoto (863) 993-4846
Glades (863) 946-0244
Hardee (863) 773-2164
Hendry (863) 674-4094
Highlands (863) 402-6540
Lee (239) 461-7500
Manatee (941) 722-4524
Okeechobee (863) 763-6469
Polk (863) 519-8677
Sarasota (941) 316-1000

LET'S WORK TOGETHER TO KEEP OUR ENVIRONMENT CLEAN...

AND INVEST IN FLORIDA'S FUTURE





DISTANCE BETWEEN SIGNS		
Speed	Spacing (ft.)	
	A	B
40 mph or less	200	200
45 mph	310	350
50 mph or greater	500	500

*Midway between signs.

Table I Device Spacing					
Speed (mph)	Max. Distance Between Devices (ft.)				
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums		
	Taper	Tangent	Taper	Tangent	
25	25	50	25	50	
30 to 45	25	50	30	50	
50 to 70	25	50	50	100	

Table II Taper Length - Shoulder				
Speed (mph)	1/2 L (ft)			Notes
	8' Shldr.	10' Shldr.	12' Shldr.	
25	28	35	42	L = WS/60
30	40	50	60	
35	55	68	82	
40	72	90	107	L = WS
45	120	150	180	
50	133	167	200	
55	147	183	220	
60	160	200	240	
65	173	217	260	
70	187	233	280	

8' = Minimum Shoulder Width

1/2 L = Length of shoulder taper in feet

W = Width of Level Shoulder in Feet (Unpaved saved and Improved Width)

S = Posted speed limit (mph)

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCR OACH THE AREA CLOSER THAN 15 BUT NOT CLOSER THAN 2' TO THE EDGE OF TRAVEL WAY

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Lane Identification + Direction of Traffic

GENERAL NOTES

- When four or more work vehicles enter the through traffic lanes in a one hour period or less (excluding establishing and terminating the work area), the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs, see Index No. 603.
- SHOULDER WORK sign may be used as an alternate to the WORKER symbol sign only on the side where the shoulder work is being performed.
- When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ indexes.
- For general TCZ requirements and additional information, refer to Index No. 600.

DURATION NOTES

- Signs and channelizing devices may be omitted if all of the following conditions are met:
 - Work operations are 60 minutes or less.
 - Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.

LAST REVISION
07/01/12

DESCRIPTION:

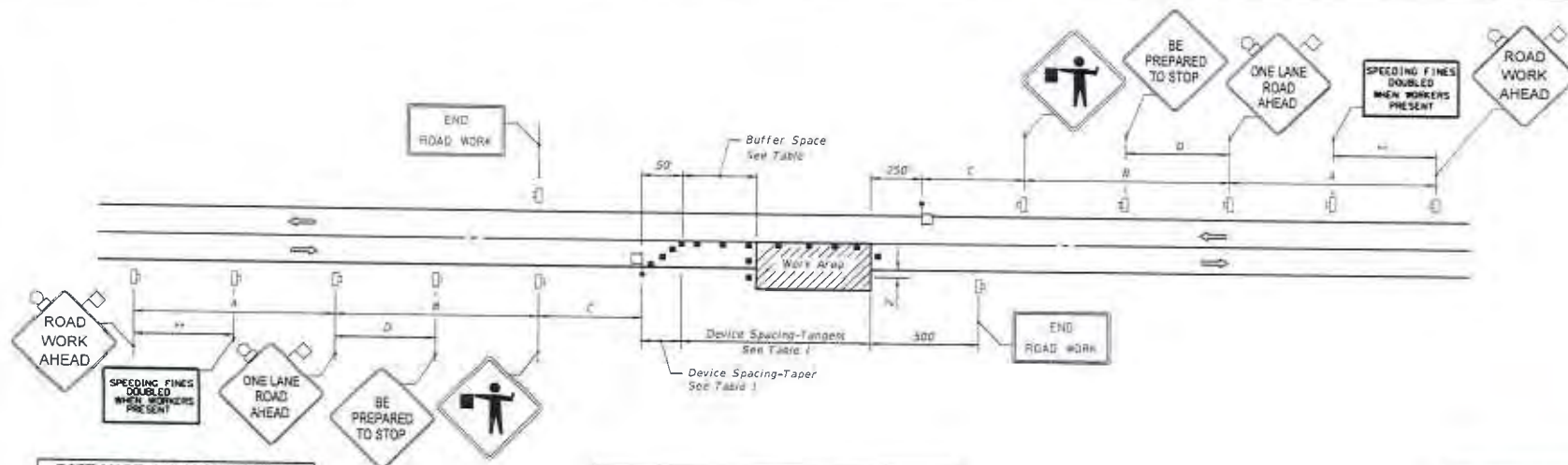


FDOT 2014
DESIGN STANDARDS

TWO-LANE, TWO-WAY, WORK ON SHOULDER

INDEX NO.
602

SHEET NO.
1 of 1



DISTANCE BETWEEN SIGNS				
Speed (mph)	Spacing (ft.)			
	A	B	C	D
40 or less	200	100	200	100
45	250	150	250	175
50	300	200	300	250
55 or greater	350	250	350	300

* The ROAD WORK 1 MILE sign may be used as an alternate to the ROAD WORK AHEAD sign.

** 500' beyond the ROAD WORK AHEAD sign or midway between signs whichever is less.

*** BE PREPARED TO STOP sign may be omitted for speeds of 45 MPH or less.

TABLE 1 DEVICE SPACING				
Speed (mph)	Max. Distance Between Devices (ft.)			
	Type I or Type II Barricades or Vertical Panels or Drums		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25 to 45	20	50	20	50
50 to 70	20	30	20	100

GENERAL NOTES

1. Work operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.
2. Additional one-way control may be effected by the following means:
 1. Flag-carrying vehicle.
 2. Official vehicle.
 3. Pilot vehicles.
 4. Traffic signals.
3. When flaggers are the sole means of one-way control, the flaggers shall be in sight of each other or in direct communication at all times.
4. The ONE-LANE ROAD signs are to be fully covered and the FLAGGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.
5. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ indexes.
6. The two channelizing devices directly in front of the work area and the one channelizing device directly at the end of the work area may be omitted provided vehicles in the work area have high-intensity rotating, flashing, oscillating, or strobe lights operating.
7. For general TCZ requirements and additional information, refer to Index No. 600.

DURATION NOTES

1. ROAD WORK AHEAD and the BE PREPARED TO STOP signs may be omitted if all of the following conditions are met:
 - a. Work operations are 60 minutes or less.
 - b. Speed limit is 45 mph or less.
 - c. No sight obstructions to vehicles approaching the work area for a distance equal to the buffer space.
 - d. Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.
 - e. Volume and complexity of the roadway has been considered.

BUFFER SPACE	
Speed (mph)	Dist. (ft.)
25	150
30	200
35	250
40	300
45	350
50	400
55	450
60	500
65	550
70	600

When Buffer Space cannot be attained due to geometric constraints, the greatest attainable length shall be used, but not less than 200 ft.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCRoACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF TRAVEL WAY.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Flagger
- Automated Flagger Assistance Devices (AFAD), WITH CAC
- Lane Identification + Direction of Traffic

LAST REVISION	DESCRIPTION	FDOT 2014 DESIGN STANDARDS	TWO-LANE, TWO-WAY, WORK WITHIN THE TRAVEL WAY	INDEX NO.	SHEET NO.
07/01/09				603	1 of 2

PERMIT VOID UNLESS DOT SARASOTA
OPERATIONS OFFICE NOTIFIED 48 HOURS IN
ADVANCE OF STARTING WORK.
PHONE: (941) 359-7300

IF A LANE CLOSURE IS WITHIN THE PROJECT
LIMITS, THE PERMITTEE MUST NOTIFY THE
DEPARTMENT 7 DAYS PRIOR TO A LANE
CLOSURE TO ALLOW THE DEPARTMENT TO
INFORM THE MOTORING PUBLIC. FAILURE
TO CALL MAY RESULT IN A DELAY TO
BEGIN WORK.

IF NO CLOSURES ARE REQUIRED THE SARASOTA
OPERATIONS OFFICE MUST BE NOTIFIED 48
HOURS IN ADVANCE OF STARTING WORK.
FAILURE TO CALL MAY RESULT IN A DELAY TO
BEGIN WORK.

LANE CLOSURES AND OTHER WORK MAY BE
RESTRICTED BY THE FDOT DUE TO HEAVY
TRAFFIC AND POTENTIAL BACKUPS CAUSED BY
THIS CONSTRUCTION. NIGHT WORK MAY BE
REQUIRED.

APPLICANT IS RESPONSIBLE FOR NOTIFYING
OWNERS OF ALL EXISTING AERIAL AND BURIED
UTILITIES OF PROPOSED DRIVEWAY AND
RESOLVING ANY CONFLICTS BEFORE
CONSTRUCTION BEGINS.

IN ACCORDANCE WITH FLORIDA STATUS 335.18
PERMITTEE SHALL BE REQUIRED TO BEAR THE
COST OF FUTURE ACCESS MODIFICATIONS,
TRAFFIC CONTROL DEVICES OR OTHER
IMPROVEMENTS, WHEN DETERMINED BY THE
FLORIDA DEPARTMENT OF TRANSPORTATION
TO BE IN CONJUNCTION WITH ACCEPTED
ENGINEERING PRACTICES.

ALL CONSTRUCTION AND/OR MAINTENANCE ON
THE DEPARTMENT'S RIGHT-OF-WAY SHALL
CONFORM TO THE FEDERAL MANUAL ON
UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
THE DEPARTMENT'S ROADWAY AND TRAFFIC
DESIGN STANDARDS AND BRIDGE
CONSTRUCTION.

PERMITTEE/CONTRACTOR MUST WAIT 30 DAYS
TO ALLOW ASPHALT FRICTION COURSE TO
CURE BEFORE PLACING THERMOPLASTIC
STRIPING.

OUR REVIEW COMMENTS ARE NOT INCLUDED
TO BE INCLUSIVE OF ALL ERRORS AND
OMISSIONS. OUR COMMENTS ARE ALSO NOT
INTENDED TO AFFECT THE SCOPE OF WORK OR
TO BE CONTRARY TO FHWA POLICY, FDOT
DESIGN CRITERIA OR SOUND ENGINEERING
PRACTICE. THE CONSULTANT/ENGINEER IS
SOLELY RESPONSIBLE FOR THE TECHNICAL
ACCURACY, ENGINEERING JUDGEMENT, AND
QUALITY OF HIS WORK.

ALL CONTRACTORS AND SUBCONTRACTORS
SHALL BE RESPONSIBLE FOR COMPLIANCE WITH
PERMITTED M.O.T. PLAN.

SOD ALL PORTIONS OF DISTURBED RIGHT-OF-WAY.

NOTE: ALL ABOVE GROUND APPURTENANCES
TO BE LOCATED AT RIGHT-OF-WAY LINE.

DENSITY REPORTS ARE TO BE SUBMITTED PRIOR
TO PLACEMENT OF PAVEMENT.

"PRIOR TO EXCAVATING CONTACT THE CLERK OF
THE CIRCUIT COURT FOR POSSIBLE GASOLINE
CONFLICT."

THE APPLICANT SHALL NOT, DURING AND AFTER
COMPLETION OF PERMITTED CONSTRUCTION,
INTRODUCE ANY FORM OR METHOD OF SITE
DRAINAGE DISCHARGE INTO THE DRAINAGE
FACILITIES ON THE DEPARTMENT OF
TRANSPORTATION RIGHT-OF-WAY OR EASEMENT.
ANY DISCHARGE SHALL BE IN VIOLATION OF THIS
PERMIT.

"PERMITTEE IS CAUTIONED THAT UTILITIES MAY BE
LOCATED WITHIN THE CONSTRUCTION AREA."

IT IS THE RESPONSIBILITY OF THE PERMITTEE TO
DETERMINE AND COMPLY WITH ALL COUNTY AND
MUNICIPAL ORDINANCES THAT ARE RELATIVE TO
THE CONSTRUCTION OR OTHER ACTIVITY
DESCRIBED ON THIS PERMIT AND ARE MORE
STRINGENT THAN DEPARTMENT OF
TRANSPORTATION REQUIREMENTS.

N.P.D.E.S. REQUIRES THAT STORM WATER CONTROL
MEASURES BE IMPLEMENTED ON ANY PROJECT ON
PUBLIC TRANSPORTATION FACILITY RIGHTS-OF-
WAY INCLUDING, BUT NOT LIMITED TO MEASURES
DESCRIBED IN F.D.O.T. STANDARD DESIGN INDEX
DRAWING NUMBERS 102, 103 AND 104.

"IF CONSTRUCTION, RECONSTRUCTION, REPAIR OR
MAINTENANCE ACTIVITY NECESSITATES THE
CLOSING OF ONE OR MORE TRAVEL LANES OF ANY
ROAD ON THE STATE PRIMARY, COUNTY ROAD OR
CITY STREET SYSTEM, FOR A PERIOD OF TIME
EXCEEDING TWO HOURS, THE PARTY PERFORMING
SUCH WORK WILL BE RESPONSIBLE TO GIVE
NOTICE TO THE APPROPRIATE LOCAL LAW
ENFORCEMENT AGENCY WHICH HAS JURISDICTION
WHERE SUCH ROAD IS LOCATED PRIOR TO
COMMENCING WORK ON THIS PROJECT"
335.15 F.S.91, 336.048 F.S.91



TOWN OF LONGBOAT KEY, FLORIDA POTABLE WATER SYSTEM SUBAQUEOUS CROSSING OF LONGBOAT PASS AND SYSTEM PRESSURE CONTROLS



IMAGE OBTAINED FROM GOOGLE EARTH PRO SEPTEMBER 2012

VICINITY MAP

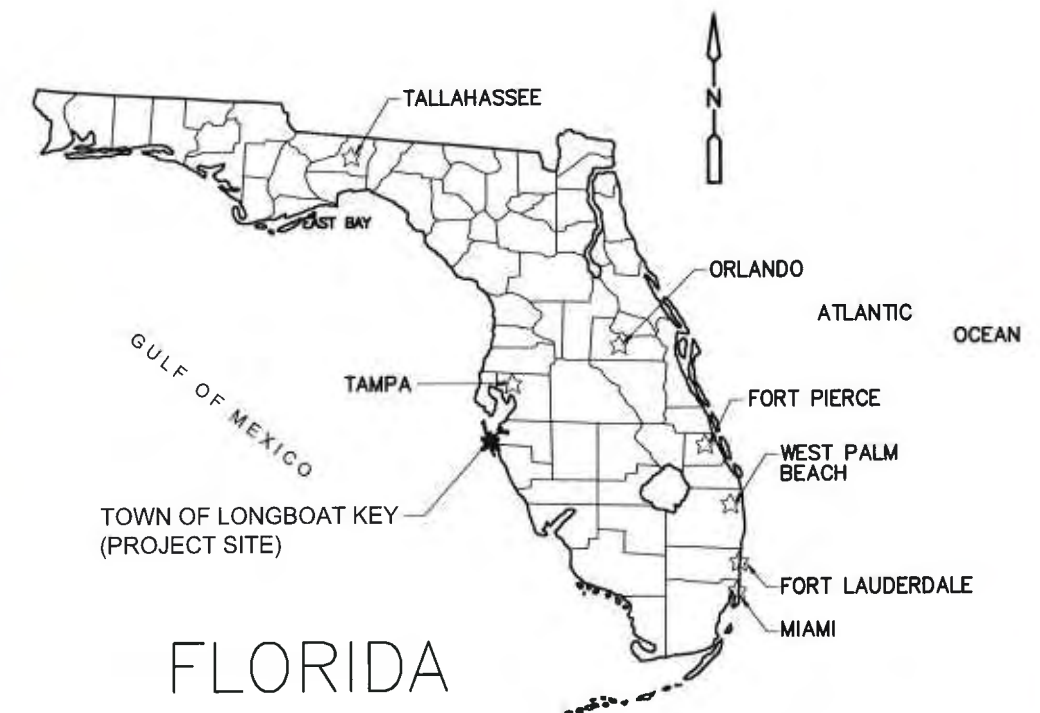


MAY 2014

**CDM
Smith**

1715 NORTH WESTSHORE BOULEVARD, SUITE 875
TAMPA, FLORIDA 33607
TEL: 813-281-2900
FL. CERT. OF AUTHORIZATION NO. EB-0000020

PROJECT NUMBER: 2790-83746



FDOT PERMIT SUBMITTAL

XREFs: [CDMS_2234] Images: []
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P:\X\CDMS\2234\1\2790\83746\04 Design Services NN_Bid\02 Civil\10 CAD\FDOT PERMIT\0001SNXG.dwg
REUSE OF DOCUMENTS: THESE DOCUMENTS AND DESIGNS PROVIDED BY PROFESSIONAL SERVICE, INCORPORATED HEREIN, ARE THE PROPERTY OF CDM SMITH AND ARE NOT TO BE USED, IN WHOLE OR PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CDM SMITH.

INDEX OF SHEETS

SHEET NO.	TITLE
GENERAL	
	COVER
G-1	INDEX AND GENERAL NOTES
G-2	ABBREVIATIONS
G-3	SYMBOLS AND LEGEND
G-4	HORIZONTAL CONTROL AND KEY SHEET
G-5	HORIZONTAL CONTROL AND KEY SHEET
CIVIL	
C-1A	PLAN
C-1B	PLAN - STA. 10+00 TO STA. 12+50
C-1C	PROFILE - STA. 10+00 TO STA. 12+50
C-2A	PLAN - STA. 12+00 TO 18+00
C-2B	PROFILE - STA. 12+00 TO 18+00
C-2C	PLAN - STA. 18+00 TO 22+00
C-2D	PROFILE - STA. 18+00 TO 22+00
C-2E	PLAN - STA. 22+00 TO 25+00
C-2F	PROFILE - STA. 22+00 TO 25+00
C-3A	PLAN - STA. 25+00 TO STA. 30+00
C-3B	PROFILE - STA. 25+00 TO STA. 30+00
C-3C	PLAN - STA. 30+00 TO STA. 34+50
C-3D	PROFILE - STA. 30+00 TO STA. 34+50
C-3E	PLAN - STA. 34+50 TO STA. 37+50
C-3F	PROFILE - STA. 34+50 TO STA. 37+50
C-4A	PLAN - STA. 37+50 TO STA. 39+00 AND STA. 20+00 TO STA. 23+00
C-4B	PROFILE - STA. 37+50 TO STA. 39+00 AND STA. 20+00 TO STA. 23+00
C-4C	PLAN - STA. 23+00 TO STA. 25+00
C-4D	PROFILE - STA. 23+00 TO STA. 25+00
C-5A	ENLARGED SITE PLANS
C-5B	ENLARGED SITE PLANS
CD-1	MISCELLANEOUS CIVIL DETAILS
CD-2	MISCELLANEOUS CIVIL DETAILS
CD-3	EROSION CONTROL DETAILS
MECHANICAL	
M-1	FLOW METERING SYSTEM AND PRESSURE REDUCING STATION PLANS AND SECTIONS

GENERAL NOTES

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE REQUIREMENTS AND STANDARDS OF ALL GOVERNING AUTHORITIES.
- PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE TO CONFIRM THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED ALL PLANS AND OTHER DOCUMENTS APPROVED BY ALL OF THE PERMITTING AUTHORITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND BUILDING PERMITS, UTILITY DISCONNECTION AND UTILITY RECONNECTION/NEW SERVICE APPLICATIONS AND FEES.
- ALL ELEVATIONS ARE REFERRED TO NORTH AMERICAN VERTICAL DATUM OF 1988.
- TOPOGRAPHIC SURVEY WAS PERFORMED BY:
GEORGE F. YOUNG, INC.
299 DR. MARTIN LUTHER KING JR. ST. N.
ST PETERSBURG, FL. 33701
PHONE 727-822-4317
- LOCATIONS OF UNDERGROUND UTILITIES ARE SHOWN BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THE CONTRACT DOCUMENTS. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES, NOTIFY INDIVIDUAL UTILITY COMPANIES 48 HOURS PRIOR TO CONSTRUCTION, AND CALL THE UNDERGROUND FACILITIES LOCATION SERVICE AT 800-432-4770. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR PROTECTION OF EXISTING UTILITIES AND NO ADDITIONAL COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR DAMAGE TO EXISTING UTILITIES.
- THE CONTRACTOR SHALL COORDINATE WITH UTILITY OWNERS FOR ANY UTILITY SERVICE DISCONNECTIONS AND RECONNECTIONS.
- OBSTRUCTIONS WHICH ARE TO REMAIN IN PLACE, SUCH AS SEWERS, DRAINS, WATER OR GAS PIPES, CONDUITS, CABLES, POLES, WALLS, POSTS, ETC. ARE TO BE CAREFULLY PROTECTED. CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO REMOVING ANY OBSTRUCTIONS NOT SPECIFICALLY NOTED ON THE PLANS.
- ALL SITE CLEARING AND CONSTRUCTION DEBRIS AND EXCESS MATERIAL SHALL BE HAULED AWAY AND DISPOSED OF APPROPRIATELY AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR CONTROL OF ALL EROSION AND SEDIMENTATION. THE CONTRACTOR SHALL INSTALL, PRIOR TO THE START OF CONSTRUCTION, AND MAINTAIN DURING CONSTRUCTION ALL SEDIMENT CONTROL MEASURES AS REQUIRED TO RETAIN ALL SEDIMENTS ON THE SITE.
- NO CONSTRUCTION, PARKING, OR STORAGE WILL OCCUR WITHIN THE DRIP LINE OF TREES TO REMAIN. ALL TREE BARRICADES WILL BE IN PLACE PRIOR TO ANY LAND DISTURBANCE.
- CONTRACTOR SHALL VISIT SITE TO FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION, CLEARING & GRUBBING REQUIRED, PRIOR TO BID SUBMISSION.
- ALL DIMENSIONS AND GRADES SHOWN ON THE PLANS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY DISCREPANCIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION FOR NECESSARY PLAN OR GRADE CHANGES. NO EXTRA COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR WORK HAVING TO BE REDONE DUE TO DIMENSIONS OR GRADES SHOWN INCORRECTLY ON THESE PLANS IF SUCH NOTIFICATION HAS NOT BEEN GIVEN.
- CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR THE LAYOUT OF THE PIPING, SITE IMPROVEMENTS AND WORK INCIDENTAL TO THE PROJECT. ANY DEVIATION FROM THE PRESCRIBED ALIGNMENT NECESSARY TO AVOID CONFLICTS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER OR OWNER.
- CONTRACTOR TO COORDINATE WITH RESPONSIBLE UTILITY FOR PROTECTION/HOLDING OF UTILITY POLES, GUY WIRES, AND GUY ANCHORS IN AREAS OF CONSTRUCTION.
- TO MAINTAIN CONTRACT PLAN CLARITY, ALL SYSTEM AND EQUIPMENT COMPONENTS MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE TO FURNISH AND INSTALL ALL EQUIPMENT, FITTINGS, ADAPTERS, CONNECTORS, PIPING, VALVES, AND OTHER COMPONENTS TO PROVIDE FULLY FUNCTIONAL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.
- CONTRACTOR SHALL MAINTAIN RECORD DRAWINGS DURING CONSTRUCTION WHICH SHOW "AS-BUILT" CONDITIONS OF ALL WORK INCLUDING PIPING, STRUCTURES, DIMENSIONS, ELEVATIONS, GRADING, ETC. RECORD DRAWINGS SHALL BE PROVIDED TO THE ENGINEER OF RECORD PRIOR TO REQUESTING FINAL INSPECTION.
- THE CONTRACTOR SHALL NOTIFY FDOT 48 HOURS IN ADVANCE PRIOR TO INITIATING ANY WORK IN THE STATE RIGHTS-OF-WAY.
- NO PROMISE OF BALANCED EARTHWORK IS PROVIDED THROUGH THE PLANS OR THE CONTRACT DOCUMENTS. THE FURNISHING OF REQUIRED SUITABLE MATERIALS OR REMOVAL OF SURPLUS SUITABLE MATERIALS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- GEOTECHNICAL SERVICES PROVIDED BY:
DRIGGERS ENGINEERING SERVICES
12220 49TH STREET NORTH
CLEARWATER, FL 33762
PHONE: 727-571-1313
- RELOCATION OF OBSTRUCTIONS OWNED BY PRIVATE PROPERTY OWNERS, SUCH AS MAIL BOXES, FENCES, SHEDS, LAWN FURNITURE, ANIMAL SHELTERS AND ENCLOSURES, ETC. SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR WHO MUST COORDINATE WITH THE PROPERTY OWNER.
- THE CONTRACTOR SHALL PLACE AND MAINTAIN ADEQUATE BARRICADES, CONSTRUCTION SIGNS, FLASHING LIGHTS, TORCHES, RED LANTERNS AND GUARDS DURING PROGRESS OF CONSTRUCTION WORK IN PUBLIC ROADWAYS, IN ACCORDANCE WITH APPLICABLE FDOT REGULATIONS.
- ALL AREAS, NOT PAVED, DISTURBED DURING CONSTRUCTION SHALL BE STABILIZED BY SODDING UNLESS OTHERWISE INDICATED. SOD SHALL BE PLACED, WATERED AND FERTILIZED IN ACCORDANCE WITH THESE CONSTRUCTION DOCUMENTS.
- A MINIMUM SEPARATION OF 10 FEET HORIZONTALLY OR 18 INCHES VERTICALLY MUST BE MAINTAINED BETWEEN WATER AND SEWER LINES. IF THIS SEPARATION IS NOT POSSIBLE, THE SEWER LINE MUST BE ENCASED IN CONCRETE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR AND COMPLY WITH ANY TESTING REQUIRED BY THE LOCAL GOVERNING AGENCY IN ADDITION TO THE TESTING REQUIREMENTS OUTLINED IN THE SPECIFICATIONS.
- MAINTENANCE OF TRAFFIC (MOT) ALONG STATE ROADS SHALL BE PER FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) STANDARDS.
- PRECONSTRUCTION PHOTOS AND/ OR VIDEO SHALL INCLUDE ALL RIGHT-OF-WAY AND PRIVATE PROPERTIES ADJACENT TO ALL WORK.
- CONTRACTOR SHALL LOCATE AND COORDINATE THE CONTRACTOR'S FIELD OFFICE SPACE (WHICH MAY, OR MAY NOT, BE A TRAILER). SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SURVEYOR'S REPORT

- TYPE OF SURVEY: TOPOGRAPHIC AND HYDROGRAPHIC.
- LIMITS: EAST SIDE OF STATE ROAD 789, FROM EDGE OF PAVEMENT TO APPARENT RIGHT OF WAY, OR TO WATER'S EDGE, WHICHEVER WAS LESS, FROM 150 FEET SOUTH OF NORTH SHORE ROAD TO 1500 FEET NORTH OF LONGBOAT PASS BRIDGE.
- SURVEY DATE: HYDROGRAPHIC SURVEY WAS PERFORMED ON JUNE 5, 2012 AND CAN ONLY INDICATE THE GENERAL CONDITIONS EXISTING ON THIS DAY. TOPOGRAPHIC SURVEY OF UPLANDS WAS COMPLETED ON MAY 30, 2012.
- PREPARED FOR: CDM SMITH AND THE TOWN OF LONGBOAT KEY.
- COORDINATES AND ELEVATIONS ARE RELATIVE HORIZONTALLY TO THE NORTH AMERICAN DATUM OF 1983, 2007 ADJUSTMENT (NAD83/07) AND VERTICALLY TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). PRIMARY CONTROL WAS ESTABLISHED USING GLOBAL POSITIONING SYSTEM METHODOLOGY.
- BASELINE DEPICTED IS FOR REFERENCE PURPOSES ONLY AND IS NOT BASED ON A RETRACEMENT OF HISTORIC FDOT ALIGNMENT.
- APPARENT RIGHT OF WAY LINES SHOWN HEREIN ARE NOT BASED ON A BOUNDARY, RIGHT OF WAY, OR BASELINE RETRACEMENT. RIGHT OF WAY LINES SHOWN ARE BASED UPON FOUND FIELD MONUMENTATION FOUND TO BE HARMONIOUS WITH LAST DEEDS OF RECORD, RIGHT-OF-WAY MAP SECTION NO. 1308-176 DATED 1956, AND PLATS OF RECORD.
- THE CONTOURS SHOWN UPON THIS SURVEY WERE CREATED BY INTERPOLATION FROM ELEVATIONS PHYSICALLY MEASURED DURING THE TOPOGRAPHIC FIELD SURVEY. FOR PURPOSES OF CLARITY, THE SPOT SHOTS OBSERVED FOR THIS SURVEY HAVE NOT BEEN SHOWN. THE ELECTRONIC LAND DEVELOPMENT DESKTOP DATABASE AND AUTOCAD DRAWING CONTAINS THE POINT DATA WHICH WAS USED TO DERIVE THE DIGITAL TERRAIN MODEL AND CONTOUR LINES.
- GEORGE F. YOUNG, INC. ACCEPTS NO RESPONSIBILITY FOR THE IDENTIFICATION OF THE TREE SPECIES SHOWN HEREON. EVERY EFFORT HAS BEEN MADE TO PROPERLY IDENTIFY THE TREES SHOWN HEREON, HOWEVER, TREE IDENTIFICATION IS OUTSIDE THE AREA OF EXPERTISE OF A PROFESSIONAL SURVEYOR AND MAPPER. THE TREE TYPES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD ONLY BE USED AFTER CONFIRMATION BY A CERTIFIED ARBORIST OR OTHER SUCH PROFESSIONAL.
- SUBSURFACE UTILITIES WERE ELECTRONICALLY DESIGNATED AND ARE NOT BASED ON PHYSICAL EXCAVATIONS.
- UTILIZATION OF THE ABOVE EQUIPMENT AND METHODS IS THE INDUSTRY RECOGNIZED PROCEDURE FOR FINDING AND LOCATING UNDERGROUND UTILITIES. ALTHOUGH EFFECTIVE AND RELIABLE, THERE IS THE POSSIBILITY THAT ALL UTILITIES MAY NOT BE DETECTED DUE TO ENVIRONMENTAL CONDITIONS, SOIL CONDITIONS, WATER TABLE, EXCESSIVE DEPTH, AND/OR FEATURE MAKEUP.
- UTILITIES LOCATED WITHIN LONGBOAT PASS WERE PERFORMED BY DIVE TECH AND BOUY LOCATIONS SURVEYED BY GEORGE F. YOUNG, INC. ELEVATIONS OF BOUY LOCATIONS DESCRIBED AS "EXPOSED" ARE EXPOSED ABOVE SURFACE TO VARYING DEGREES PER DIVE TECH, AND AS SUCH, ELEVATIONS LISTED ARE BASED ON THE APPROXIMATE SURFACE ELEVATION. OTHER ELEVATIONS AT BOUY LOCATIONS ARE DERIVED BY SUBTRACTING THE DEPTH OF COVER REPORTED BY DIVE TECH, FROM THE APPROXIMATE SURFACE ELEVATION UNLESS LISTED AS "DIRECT SHOT" WHICH ARE DIRECTLY MEASURED ELEVATIONS.
- THE INTENDED DISPLAY SCALE OF THIS MAP OF SURVEY, IS 1" = 40' OR 1:480.
- ADDITIONS OR DELETIONS TO SURVEY MAPS OR REPORTS BY OTHER THAN THE SIGNING PARTY OR PARTIES ARE PROHIBITED WITHOUT THE WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.

UTILITY CONTACT INFORMATION

DAVID ALVAREZ
FLORIDA POWER AND LIGHT
2900 CATHERINE ST.
PALATKA, FL. 32177
1-800-868-9554

JOHN MICHAEL
LONGBOAT KEY UTILITIES
600 GENERAL HARRIS STREET
LONGBOAT KEY, FLORIDA 34228
(941) 316-1988

GONZALO ROJAS
COMCAST CABLEVISION OF WEST FLORIDA
174 RICH ST.
VENICE, FL. 34292
(941)-342-3578

PATTI REID
VERIZON FLORIDA INC.
1701 RINGLING BLVD.
SARASOTA, FL. 34236
(941)-906-6711

DANIEL J. SHANAHAN
PEOPLES GAS SYSTEM
TECO - PEOPLES GAS
8261 VICO CT.
SARASOTA, FL. 34240
(941)-342-4006

KATHY McMAHON
MANATEE COUNTY UTILITIES
4422-C 66TH STREET WEST
BRADENTON, FL. 34210
(941)-792-8811 EXT. 5002

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

INDEX AND GENERAL NOTES

DESIGNED BY: K. LOWE	
DRAWN BY: D. AUGI	
SHEET CHK'D BY: C. SCOTT	
CROSS CHK'D BY: K. LOWE	
APPROVED BY: G. CASHON	
DATE: MAY 2014	

REV.	DATE	DRAWN	CHK'D	REMARKS

CDM Smith
1715 North Westshore Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 281-2900
FL COA No. EB-0006020



PROJECT NO. 2790-83746
FILE NAME: 0001SNXG.DWG
SHEET NO.
G-1

FDOT PERMIT SUBMITTAL

LICENSE
 No. 43591
 ★
 STATE OF
 DATE: 10/19/94
 GINA C. CASHON, P.E.
 PE No. 43591
 PROJECT NO. 2790-83746
 FILE NAME: G002SNXG.DWG
 SHEET NO.
 G-2

XREFs: [CDMS_2234] Images: []
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PW\\jcdpwp001\\PW_XMT\\2790\\83746\\G4 Design Services NM_Bldg02 Cvil\\10 CAD\\F00T PERM\\G003SYMB.dwg
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PIPING SYMBOLOGY

DOUBLE LINE SYMBOL	SINGLE LINE SYMBOL	FEATURE
		WELDED JOINT
		FLANGED JOINT SIMPLIFIED REPRESENTATION
		FLANGED JOINT COMPLEX REPRESENTATION
		MECHANICAL JOINT SIMPLIFIED REPRESENTATION
		MECHANICAL JOINT COMPLEX REPRESENTATION
		MECHANICAL JOINT RESTRAINED
		PUSH ON JOINT OR CAULKED BELL & SPIGOT JOINT SIMPLIFIED REPRESENTATION
		PUSH ON JOINT OR CAULKED BELL & SPIGOT JOINT COMPLEX REPRESENTATION
		PUSH ON JOINT OR CAULKED BELL & SPIGOT JOINT RESTRAINED
		BALL JOINT
		DIRECTION OF FLOW
		PLAIN END x PLAIN END PIPE COUPLING
		PLAIN END x PLAIN END PIPE COUPLING RESTRAINED
		FLANGE x PLAIN END PIPE COUPLING
		FLEXIBLE COUPLING OR EXPANSION JOINT (SLEEVE TYPE)
		FLEXIBLE COUPLING OR EXPANSION JOINT (BELLOWS TYPE)
		COUPLING FOR VICTAULIC JOINTS: (G) GROOVED
		(S) SHOULDERED
		FLANGE GUARD
		FLANGE FILLER
		UNION
		QUICK CONNECT COUPLING
		HOSE COUPLING

PIPE AND FITTING SYMBOL NOTES:

- SIMPLIFIED JOINT SYMBOL IS USED FOR ALL SINGLE LINE PIPING SHOWN ON THE INTERIOR AND EXTERIOR PIPING DRAWINGS.
- BOTH SIMPLIFIED AND COMPLEX JOINT REPRESENTATIONS MAY BE SHOWN ON THE DRAWINGS.
- UNLESS MODIFIED BY THE GENERAL PROJECT NOTES OR DETAILED ON THE LAYOUT AND SCHEMATIC DRAWINGS PIPE AND FITTING JOINT REQUIREMENTS FOR THE VARIOUS PIPE MATERIALS ARE DEFINED IN THE SPECIFICATIONS.

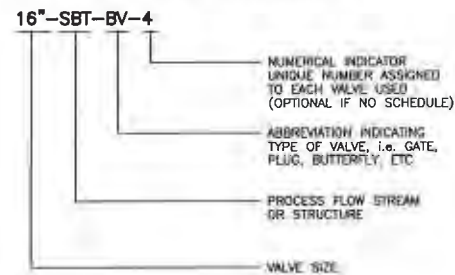
VALVE SYMBOLOGY

SYMBOL	FEATURE
	UNCLASSIFIED TYPE AS SHOWN ON THE DRAWINGS ADJACENT TO SYMBOL
	FLOW METER
	TELESCOPING VALVE
	VALVE WITH HOSE END
	GATE VALVE
	KNIFE GATE VALVE
	GLOBE VALVE
	BALL VALVE
	3-WAY BALL VALVE
	4-WAY BALL VALVE
	CONE VALVE
	NEEDLE VALVE
	PINCH VALVE
	DIAPHRAGM VALVE
	BUTTERFLY VALVE
	PLUG VALVE
	3-WAY PLUG VALVE
	4-WAY PLUG VALVE
	CHECK VALVE, GENERAL SYMBOL
	BALL CHECK VALVE
	DOUBLE DOOR CHECK VALVE
	ANGLE VALVE
	SOLENOID VALVE
	THREE WAY SOLENOID VALVE
	FOUR WAY SOLENOID VALVE
	MOTOR OPERATED VALVE
	FLAP VALVE
	SHEAR GATE
	MUD VALVE
	FLOOR DRAIN
	OPEN EQUIPMENT DRAIN
	ECCENTRIC REDUCER OR REDUCING BUSHING
	CONCENTRIC REDUCER OR REDUCING BUSHING
	Y-STRAINER
	CALIBRATION CYLINDER
	AIR RELEASE VALVE

SYMBOL SYMBOLOGY

ANTENNA
BUOY
SERVICE BOX - CABLE TV
CONCRETE MONUMENT
CONCRETE POWER POLE
WITNESS POST
FIRE HYDRANT
GUY ANCHOR
MAILBOX
MANHOLE - UNKNOWN UTILITY
LIGHT POLE
METER - ELECTRIC
METER - WATER
POST
SHARED UTILITY POLE
SHRUB
SINGLE SUPPORT SIGN
TELEPHONE PESTAL/SERVICE
TRASH CAN
TREE - CEDAR
TREE - UNKNOWN OR AS LABELED
TREE - OAK
TREE - PALM
TREE - PINE
VALVE COVER - RECLAIMED
VALVE COVER - SANITARY
VALVE COVER - WATER
VALVE - WATER
PULLBOX
POWER POLE - WOOD

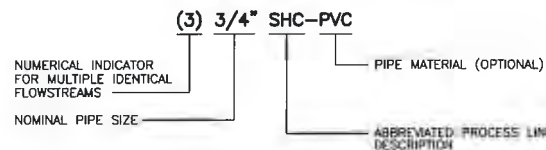
VALVE TAG (OPTIONAL)



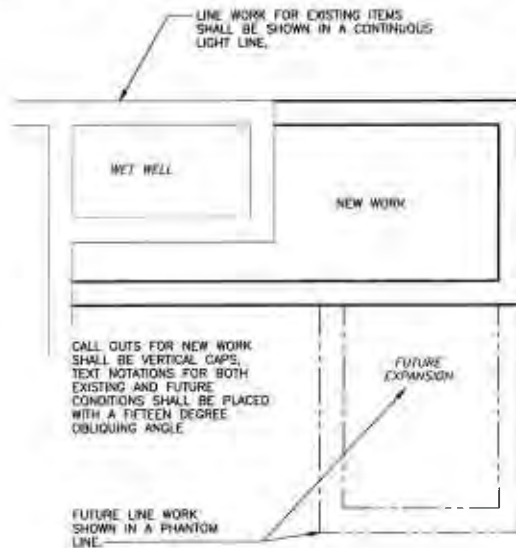
PIPELINE APPURTENANCES SYMBOLOGY

DOUBLE LINE SYMBOL	SINGLE LINE SYMBOL	FEATURE
		FLOW METER, GENERAL SYMBOL
		VENTURI FLOW METER
		FLOOR DRAIN
		OPEN EQUIPMENT DRAIN
		Y-STRAINER
		CALIBRATION CYLINDER

PIPE TAG



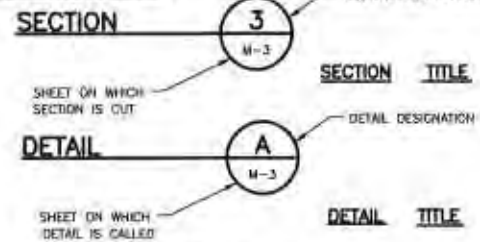
EXISTING OR FUTURE CONDITION DESIGNATION



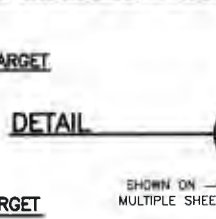
LEGEND

	NEW WATER MAIN THIS PROJECT
	EXISTING WATER MAIN
	EXISTING SANITARY SEWER W/ MANHOLE
	EXISTING FORCE MAIN
	EXISTING LIGHT POLE
	EXISTING GAS MAIN
	EXISTING GAS LINE MARKER
	COMBINATION ARM
	FIRE HYDRANT
	BURIED ELECTRIC
	BURIED FIBER OPTIC
	BURIED TELEPHONE
	APPARENT RIGHT OF WAY
	APPARENT PROPERTY LINES
	OVERHEAD UTILITY LINES
	NEW MAIN TO BE CONST. UNDER EXISTING UTILITY
	NEW MAIN TO BE CONST. OVER EXISTING UTILITY
	WATER BORING
	SOIL BORING
	BENCH MARK
	EXISTING CHAIN LINK FENCE
	NEW/ TEMPORARY CHAIN LINK FENCE
	NEW STRUCTURES
	EXISTING STRUCTURES (TO REMAIN)
	EXISTING STRUCTURES (TO BE REMOVED)
	NEW CONCRETE SLAB OR SIDEWALKS
	FUTURE STRUCTURE
	EXISTING ELEVATION
	EXISTING CATCH BASIN
	EXISTING WATER VALVE
	EXISTING WOOD POST
	TEMPORARY CONSTRUCTION EASEMENT
	SOVEREIGN SUBMERGED LAND EASEMENT

SECTION CUT TARGET



DETAIL CALL OUT TARGET



SECTION AND DETAIL NUMBERING SYSTEM

N.T.S.

REV.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:	K. LOBE
DRAWN BY:	D. AUST
SHEET CHK'D BY:	C. SCOTT
CROSS CHK'D BY:	K. LOBE
APPROVED BY:	G. CASHON
DATE:	MAY 2014

**CDM
Smith**

1715 North Westshore Blvd., Suite 675
Tampa, FL 33607
Tel: (813) 281-2900
FL COA No. EB-000020

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

SYMBOLS AND LEGEND

STATE OF
FLORIDA
G. CASHON
No. 43891
DATE
G. CASHON, P.E.
PE/NO. 43891

PROJECT NO. 2790-83746
FILE NAME: G003SYMB.DWG

SHEET NO.

G-3

NOT PERMIT SUBMITTAL

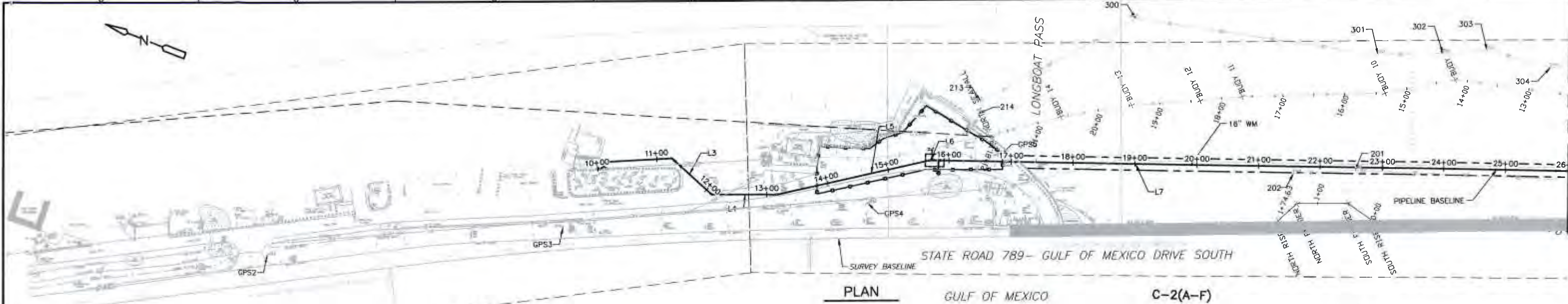
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BOUY LOCATIONS: POWER LINES				
POINT#	NORTHING	EASTING	DESCRIPTION	ELEVATION
201	1131266.6	433147.2	EXPOSED 4" ABANDONED POWER	-24'
202	1131358.3	433107.2	EXPOSED 4" ABANDONED POWER	-24'
203	1130558.2	433377.4	EXPOSED 4" ABANDONED POWER	-16'
213	1131873.2	433037.6	EXPOSED 4" ACTIVE POWER	-12'
214	1131868.8	433018.4	EXPOSED 4" ACTIVE POWER	-8'
215	1129901.3	433653.2	4" ACTIVE POWER (DIRECT SHOT)	-3.0'
216	1129917.0	433648.8	4" ACTIVE POWER (DIRECT SHOT)	-4.3'
218	1129942.1	433642.7	4" ACTIVE POWER (DIRECT SHOT)	-4.5'
219	1129970.1	433634.6	4" ACTIVE POWER (DIRECT SHOT)	-6.0'
220	1130013.1	433624.1	4" ACTIVE POWER (DIRECT SHOT)	-4.8'
300	1131685.8	433249.9	4" ACTIVE POWER(TONE ONLY)	UNKNOWN
301	1131298.5	433332.6	4" ACTIVE POWER (4' COVER)	-17'
302	1131199.8	433371.4	4" ACTIVE POWER (3' COVER)	-13'
303	1131134.8	433401.4	4" ACTIVE POWER (3' COVER)	-12'
304	1131029.5	433411.7	EXPOSED 4" ACTIVE POWER	-11'
305	1130675.4	433573.3	EXPOSED 4" ACTIVE POWER	-12'
306	1130540.0	433615.6	EXPOSED 4" ACTIVE POWER	-15'
307	1130377.8	433673.5	4" ACTIVE POWER (2' COVER)	-14'
308	1130284.6	433657.0	4" ACTIVE POWER (2' COVER)	-8'
309	1130225.1	433649.3	4" ACTIVE POWER (2' COVER)	-8'
310	1130170.9	433619.7	4" ACTIVE POWER (2' COVER)	-8'
311	1130110.9	433598.3	4" ACTIVE POWER (2' COVER)	-4'

BOUY LOCATIONS: SUBAQUEOUS 16" DIA. WATER LINE			
LOCATION	WATER DEPTH (MLW)	PIPE ELEVATION	OVER BURDEN
SOUTH VALVE	N/A	N/A	N/A
BUOY1	-2.6	-5.6	3.0
BUOY2	-2.3	-5.3	3.0
BUOY3	-5.1	-8.1	3.0
BUOY4	-12.1	-16.1	4.0
BUOY5	-13.2	-17.2	4.0
BUOY6	-13.8	-18.3	4.5
BUOY7	-6.8	-16.3	9.5
BUOY8	-11.7	-18.7	7.0
BUOY9	-11.9	-18.4	6.5
BUOY10	-14.2	-18.2	4.5
BUOY11	-13.7	-17.7	4.0
BUOY12	-18.0	-18.2	EXPOSED
BUOY13	-17.2	-17.7	0.5
BUOY14	-15.7	-15.4	EXPOSED
NORTH SEAWALL	-0.8	-0.6	EXPOSED

NOTES FOR SUBAQUEOUS 16" DIA. WATER LINE:

- INFORMATION TAKEN FROM THE RECORD SURVEY OF LONGBOAT PASS PIPELINE OCT. 2007 BY GEORGE F. YOUNG.
- WATER DEPTH, OVERBURDEN, AND ELEVATION OF PIPE INFORMATION FOUND IN THE TABLE SHOWN HEREON WAS PROVIDED BY DIVE TECH INTERNATIONAL.
- ELEVATIONS REFER TO MEAN LOW WATER (MLW) DETERMINED BY DIVE TECH INTERNATIONAL AND MEASUREMENTS ARE IN DECIMAL FEET.
- HORIZONTAL COORDINATES ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 (N.A.D. 83), STATE PLANE COORDINATE SYSTEM, FLORIDA WEST ZONE IN U.S. SURVEY FEET.
- HORIZONTAL CONTROL IS BASED ON USCG BEACON AT MACDILL AIR FORCE BASE.
- A TRIMBLE DGPS SURVEYING SYSTEM WITH SUB-METER REAL-TIME ACCURACY WAS USED TO LOCATE BUOYS.
- THE INFORMATION DEPICTED HEREON REPRESENTS A SURVEY MADE ON 8/03/07 AND CAN ONLY INDICATE THE GENERAL CONDITIONS EXISTING ON SAID DATE.
- THIS IS NOT A BOUNDARY SURVEY



PRIMARY CONTROL POINTS				
NAME	NORTHING	EASTING	ELEV	DESCRIPTION
GPS1	1133306.73	432086.20	4.56	1/2" IRON ROD GFY
GPS2	1132861.94	432399.65	5.48	1/2" IRON ROD GFY
GPS3	1132431.32	432611.05	5.68	1/2" IRON ROD GFY
GPS4	1131984.59	432821.19	8.86	1/2" IRON ROD GFY
GPS5	1131811.14	432970.78	3.65	1/2" IRON ROD GFY
GPS6	1129751.79	433607.61	14.07	RIVET AND DISK GFY
GPS7	1129450.80	433744.26	9.72	1/2" IRON ROD GFY
GPS8	1129030.81	433707.69	4.67	1/2" IRON ROD GFY

NOTE FOR PRIMARY CONTROL POINTS:

GPS1 AND GPS8 ARE OUTSIDE OF AREA SHOWN

ALIGNMENT LINE DATA						
LINE #	BEARING	DISTANCE	START STATION	END STATION	START POINT	END POINT
L3	S21° 08' 30.13"W	86.55	11+24.43	12+10.98	N=1132306.66 E=432776.35	N=1132225.93 E=432745.14
L4	S20° 35' 13.06"E	105.65	12+10.98	13+16.63	N=1132225.93 E=432745.14	N=1132127.03 E=432782.29
L5	S33° 11' 15.69"E	251.67	13+16.63	15+68.31	N=1132127.03 E=432782.29	N=1131916.41 E=432920.05
L6	S24° 07' 40.88"E	4.60	15+68.31	15+72.91	N=1131916.41 E=432920.05	N=1131912.21 E=432921.93
L7	S19° 37' 42.83"E	2271.66	15+72.91	38+44.57	N=1131912.21 E=432921.93	N=1129772.55 E=433685.03
L8	S69° 08' 03.44"W	19.16	38+44.57	38+63.73	N=1129772.55 E=433685.03	N=1129765.73 E=433667.12
L9	S20° 31' 31.24"E	0.33	38+63.73	38+64.06	N=1129765.73 E=433667.12	N=1129765.42 E=433667.24
L10	S20° 08' 53.78"E	64.20	20+00.00	20+64.20	N=1129806.71 E=433679.45	N=1129746.44 E=433701.56
L11	S2° 22' 30.18"E	56.04	20+64.20	21+20.24	N=1129746.44 E=433701.56	N=1129690.44 E=433703.88
L12	S19° 36' 37.31"E	43.88	21+20.24	21+64.12	N=1129690.44 E=433703.88	N=1129649.11 E=433718.61
L13	S17° 13' 21.99"E	52.63	21+64.12	22+16.75	N=1129649.11 E=433718.61	N=1129598.84 E=433734.19
L14	S8° 11' 54.62"E	117.79	22+16.75	23+34.54	N=1129598.84 E=433734.19	N=1129482.26 E=433750.99
L15	S9° 23' 16.59"E	38.21	23+76.62	24+14.84	N=1129440.41 E=433755.50	N=1129402.71 E=433761.73
L16	S1° 39' 43.84"W	33.56	24+14.84	24+48.40	N=1129402.71 E=433761.73	N=1129369.16 E=433760.76

GENERAL NOTES:

- EXACT LOCATION AND ELEVATION INFORMATION IS NOT AVAILABLE FOR THE EXISTING VERIZON UTILITY.
- WITHIN CONSTRUCTION ACTIVITIES CONTRACTOR TO FIELD LOCATE AND PROTECT ALL EXISTING UTILITIES.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. LOWE	CDM Smith
DRAWN BY: D. AUST	1715 North Westshore Blvd., Suite 875
SHEET CHECKED BY: C. SCOTT	Tampa, FL 33607
CROSS CHECKED BY: K. LOWE	Tel: (813) 281-2900
APPROVED BY: G. CASHON	FL COA No. EB-0000620
DATE: MAY 2014	

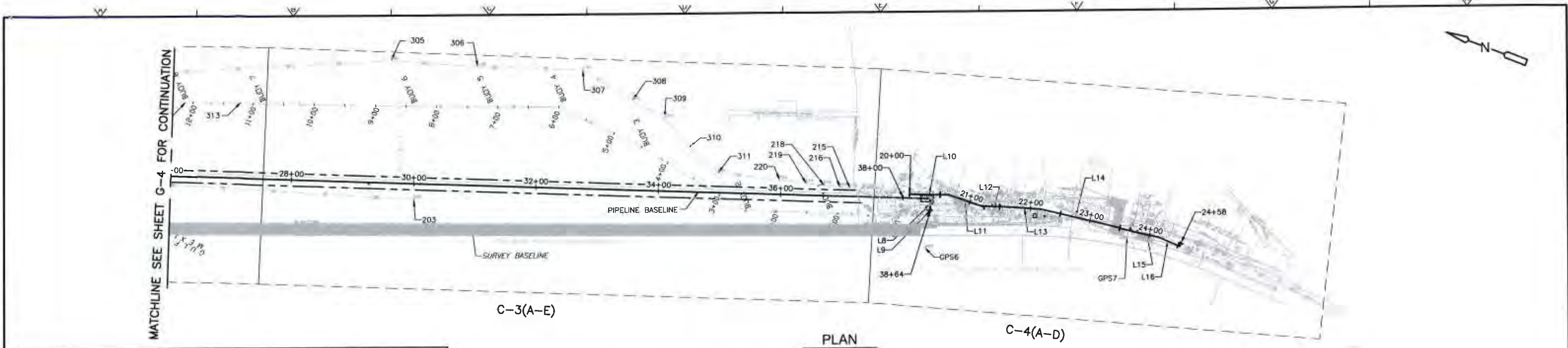
TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

HORIZONTAL CONTROL AND
KEY SHEET

PROJECT NO. 2790-63746	STATE OF FLORIDA
FILE NAME: G004PLPF.DWG	GINA C. CASHON, P.E.
SHEET NO. G-4	PE No. 143891

FDOT PERMIT SUBMITTAL

XREFS: [CE-SURVEY, C-BASE-PLAN, CE-ADD-SURVEY, CDS-2234] Imaget: []
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LOCATION	WATER DEPTH (MLW)	PIPE ELEVATION	OVER BURDEN
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BUOY7	-6.8	-16.3	9.5
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BUOY9	-11.9	-18.4	6.5
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BUOY11	-13.7	-17.7	4.0
BUOY12	-18.0	-18.2	EXPOSED
BUOY13	-17.2	-17.7	0.5
BUOY14	-15.7	-15.4	EXPOSED
NORTH SEAWALL	-0.8	-0.6	EXPOSED

NOTES FOR SUBAQUEOUS 16" DIA. WATER LINE:

1. INFORMATION TAKEN FROM THE RECORD SURVEY OF LONGBOAT PASS PIPELINE OCT. 2007 BY GEORGE F. YOUNG.
2. WATER DEPTH, OVERBURDEN, AND ELEVATION OF PIPE INFORMATION FOUND IN THE TABLE SHOWN HEREON WAS PROVIDED BY DIVE TECH INTERNATIONAL.
3. ELEVATIONS REFER TO MEAN LOW WATER (MLW) DETERMINED BY DIVE TECH INTERNATIONAL AND MEASUREMENTS ARE IN DECIMAL FEET.
4. HORIZONTAL COORDINATES ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 (N.A.D. 83), STATE PLANE COORDINATE SYSTEM, FLORIDA WEST ZONE IN U.S. SURVEY FEET.
5. HORIZONTAL CONTROL IS BASED ON USCG BEACON AT MACDILL AIR FORCE BASE.
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8. THIS IS NOT A BOUNDARY SURVEY

PRIMARY CONTROL POINTS				
NAME	NORTHING	EASTING	ELEV	DESCRIPTION
GPS1	1133306.73	432086.20	4.56	1/2" IRON ROD GFY
GPS2	1132861.94	432399.65	5.48	1/2" IRON ROD GFY
GPS3	1132431.32	432611.05	5.68	1/2" IRON ROD GFY
GPS4	1131984.59	432821.19	8.86	1/2" IRON ROD GFY
GPS5	1131811.14	432970.78	3.65	1/2" IRON ROD GFY
GPS6	1129751.79	433607.61	14.07	RIVET AND DISK GFY
GPS7	1129450.80	433744.26	9.72	1/2" IRON ROD GFY
GPS8	1129030.81	433707.69	4.67	1/2" IRON ROD GFY

NOTE FOR PRIMARY CONTROL POINTS:
GPS1 AND GPS8 ARE OUTSIDE OF AREA SHOWN

ALIGNMENT LINE DATA						
LINE #	BEARING	DISTANCE	START STATION	END STATION	START POINT	END POINT
L3	S21° 08' 30.13"W	86.55	11+24.43	12+10.98	N=1132306.66 E=432776.35	N=1132225.93 E=432745.14
L4	S20° 35' 13.06"E	105.65	12+10.98	13+16.63	N=1132225.93 E=432745.14	N=1132127.03 E=432782.29
L5	S33° 11' 15.69"E	251.67	13+16.63	15+68.31	N=1132127.03 E=432782.29	N=1131916.41 E=432920.05
L6	S24° 07' 40.88"E	4.60	15+68.31	15+72.91	N=1131916.41 E=432920.05	N=1131912.21 E=432921.93
L7	S19° 37' 42.83"E	2271.66	15+72.91	38+44.57	N=1131912.21 E=432921.93	N=1129772.55 E=433685.03
L8	S69° 08' 03.44"W	19.16	38+44.57	38+63.73	N=1129772.55 E=433685.03	N=1129765.73 E=433667.12
L9	S20° 31' 31.24"E	0.33	38+63.73	38+64.06	N=1129765.73 E=433667.12	N=1129765.42 E=433667.24
L10	S20° 08' 53.78"E	64.20	20+00.00	20+64.20	N=1129806.71 E=433679.45	N=1129746.44 E=433701.56
L11	S2° 22' 30.18"E	56.04	20+64.20	21+20.24	N=1129746.44 E=433701.56	N=1129690.44 E=433703.88
L12	S19° 36' 37.31"E	43.88	21+20.24	21+64.12	N=1129690.44 E=433703.88	N=1129649.11 E=433718.61
L13	S17° 13' 21.99"E	52.63	21+64.12	22+16.75	N=1129649.11 E=433718.61	N=1129598.84 E=433734.19
L14	S8° 11' 54.62"E	117.79	22+16.75	23+34.54	N=1129598.84 E=433734.19	N=1129482.26 E=433750.99
L15	S9° 23' 16.59"E	38.21	23+34.54	24+14.84	N=1129440.41 E=433755.50	N=1129402.71 E=433761.73
L16	S1° 39' 43.84"W	33.56	24+14.84	24+48.40	N=1129402.71 E=433761.73	N=1129369.16 E=433760.76

GENERAL NOTES:

1. EXACT LOCATION AND ELEVATION INFORMATION IS NOT AVAILABLE FOR THE EXISTING VERIZON UTILITY.
2. WITHIN CONSTRUCTION ACTIVITIES CONTRACTOR TO FIELD LOCATE AND PROTECT ALL EXISTING UTILITIES.

DESIGNED BY: K. LOVE	
DRAWN BY: D. ALST	
SHEET CHECKED BY: G. SCOTT	
CROSS CHECKED BY: K. LOVE	
APPROVED BY: G. CASHION	
DATE: MAY 2014	

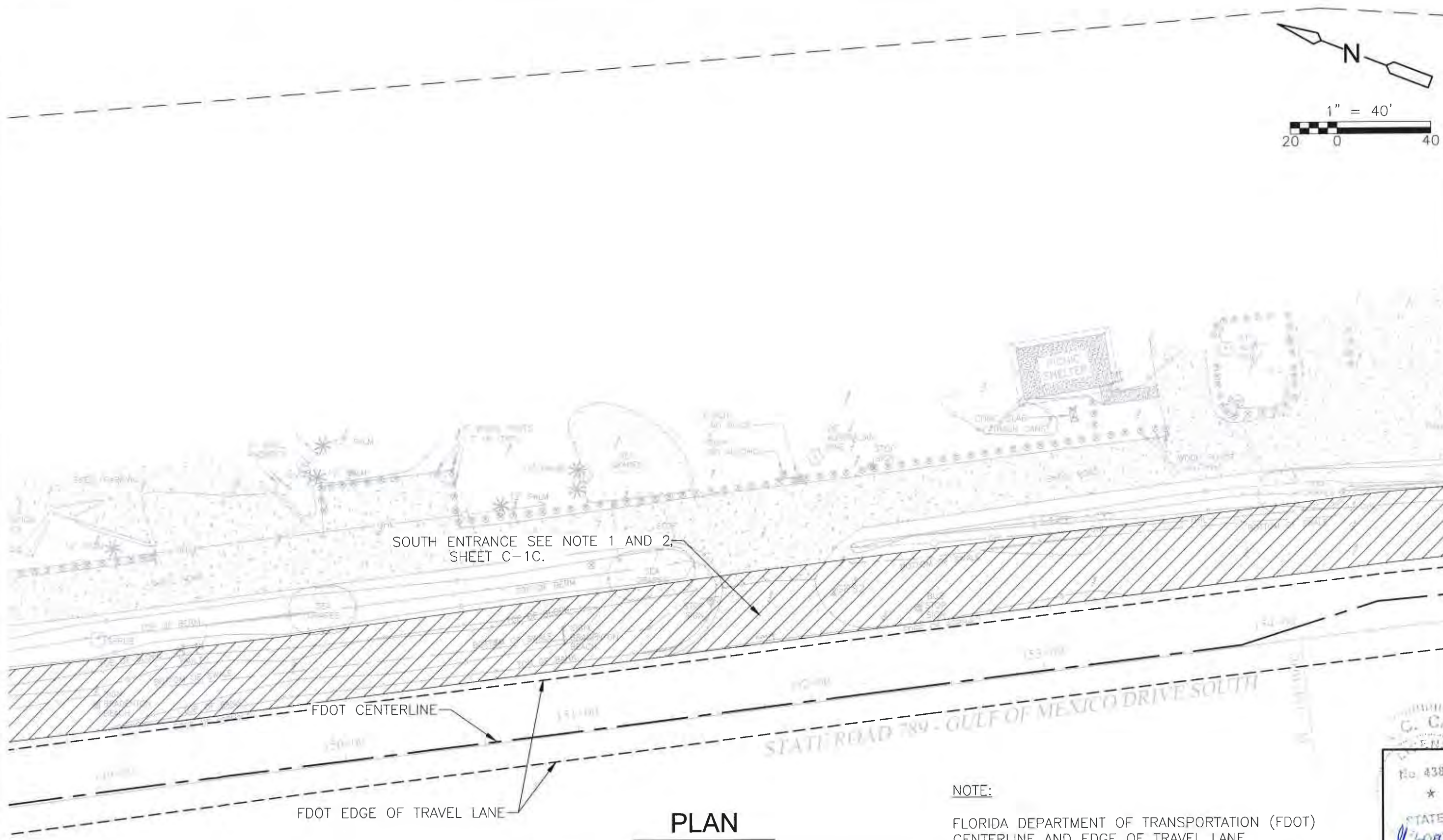
TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

HORIZONTAL CONTROL AND
KEY SHEET

PROJECT NO. 2790-B374E
FILE NAME: G005PLPF.DWG
SHEET NO. G-5



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PLAN

1"=40'

NOTE:

FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT)
CENTERLINE AND EDGE OF TRAVEL LANE
INFORMATION TAKEN FROM DATA FILES PROVIDED
BY FDOT SURVEYING & MAPPING DEPARTMENT.

SEE C-1B FOR CONTINUATION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. LOWE
DRAWN BY: D. AUST
SHEET CHK'D BY: C. SCOTT
CROSS CHK'D BY: K. LOWE
APPROVED BY: G. CASHON
DATE: MAY 2014

CDM Smith
1745 North Westshore Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 281-2900
FL COA No. EB-0005029

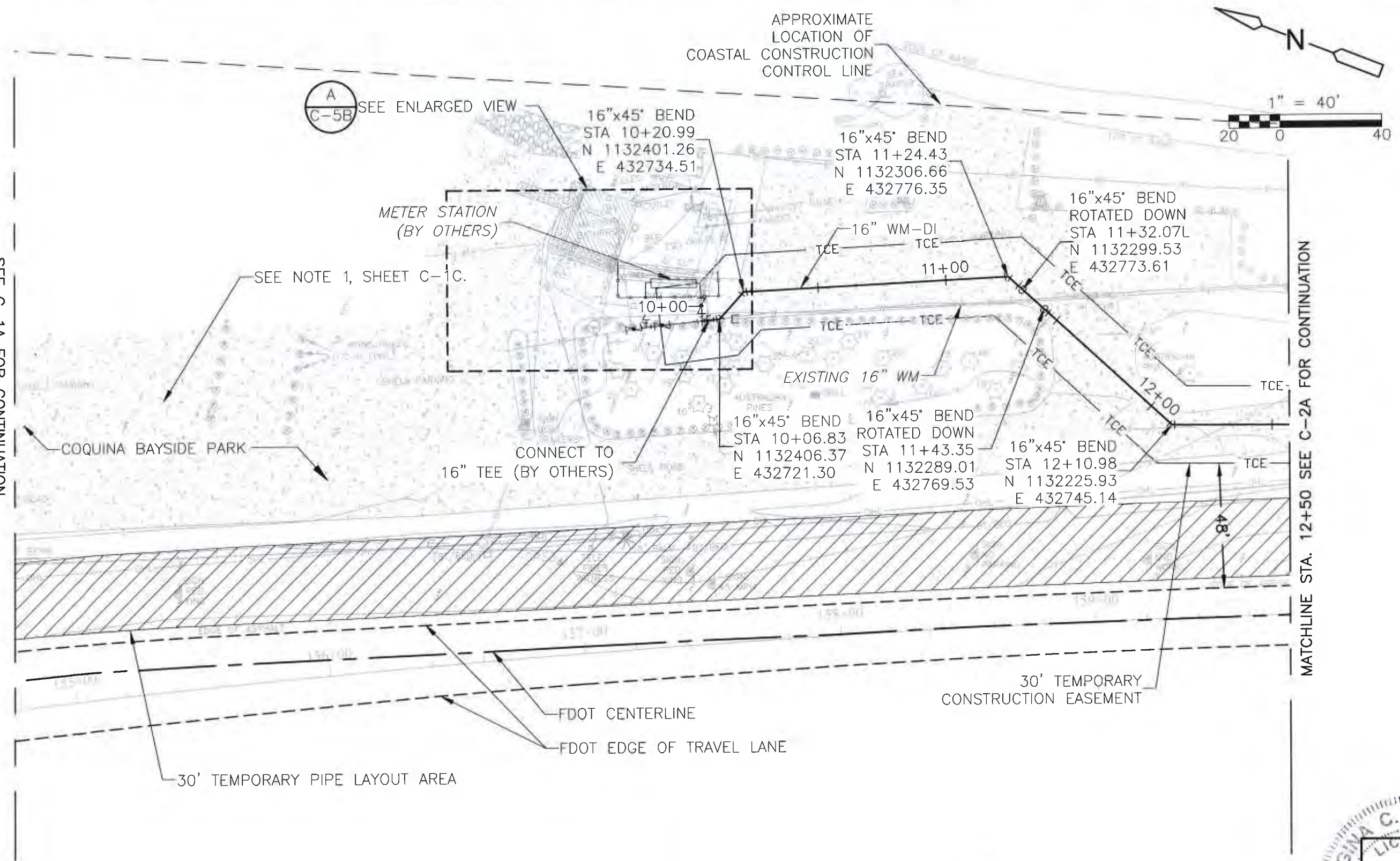
TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

PLAN

No. 43891	
★	
STATE OF FLORIDA	
DATE: 5/20/14	PE NO. 43891
PROJECT NO. 2790-83746	
FILE NAME:	
SHEET NO.	
C-1A	

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SEE C-1A FOR CONTINUATION



PLAN
1"=40'

NOTE:
FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT)
CENTERLINE AND EDGE OF TRAVEL LANE
INFORMATION TAKEN FROM DATA FILES PROVIDED
BY FDOT SURVEYING & MAPPING DEPARTMENT.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. LOWE	
DRAWN BY: D. ALST	
SHEET CHK'D BY: C. SCOTT	
CROSS CHK'D BY: K. LOWE	
APPROVED BY: G. CASHON	
DATE: MAY 2014	

CDM Smith
1715 North Woodstone Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 281-2500
FL CDR No. EB-0000201

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

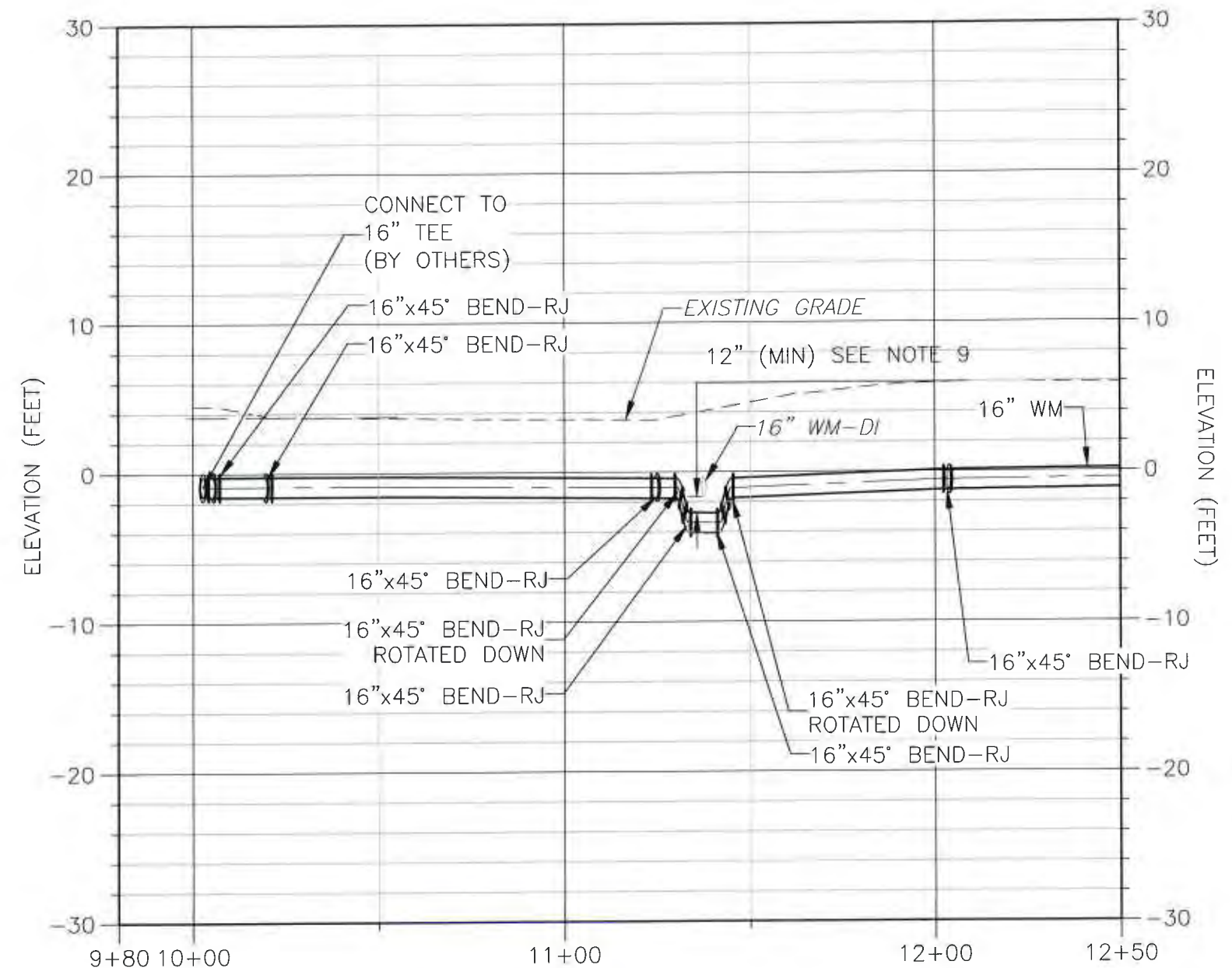
PLAN
STA. 10+00 TO STA. 12+50

GINA C. CASHON
LICENSE
No. 43891
STATE OF FLORIDA
DATE: 5/14/14
GINA C. CASHON, P.E.
PE/NO. 43891
PROJECT NO. 2790-83746
FILE NAME:
SHEET NO.
C-1B

XREFs: [CE-SURVEY, C-BASE-PLAN, C-BASE-PROFILE, 11017700SU-Topo_New, CDMS_2234, FDOT_PERMIT] Images: ☐
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NOTES:

1. COQUINA BAYSIDE PARK AND BOAT RAMP SHALL REMAIN OPEN TO TRAFFIC AT ALL TIMES. ACCESS TO THE PARK SHALL BE THROUGH NORTH ENTRANCE, DURING PIPE LAYOUT ACTIVITIES.
2. CONTRACTOR MAY BLOCK SOUTH ENTRANCE TEMPORARILY FOR PIPE LAYOUT. CONTRACTOR SHALL MEET ALL REQUIREMENTS OF MANATEE COUNTY AND FDOT.
3. CONTRACTOR SHALL PRESERVE AND PROTECT ALL TREES DURING CONSTRUCTION ACTIVITIES.
4. CONTRACTOR TO PROTECT SIGNS AND GUARDRAIL WITHIN PIPE LAYOUT AREA DURING ALL CONSTRUCTION ACTIVITIES.
5. CONTRACTOR SHALL PROVIDE REQUIRED MOT PER FDOT STANDARDS AND PROVIDE ALL SUPPLEMENTAL SIGNAGE TO ENSURE PUBLIC SAFETY AND CONSTRUCTION NOTIFICATION.
6. WITHIN THE 30' WIDE TEMPORARY LAYOUT AREA, THE CONTRACTOR SHALL LIMIT CONSTRUCTION AREA AND LIMIT CONSTRUCTION ACTIVITIES TO THE STRINGING, FUSING AND LAYOUT OF PIPE ONLY. SEE ADDITIONAL REQUIREMENTS IN SPECIFICATIONS SECTION 01014.
7. FOR OPEN CUT CONSTRUCTION OF THE 16" WATER MAIN, THE CONTRACTOR SHALL LIMIT CONSTRUCTION AREA TO 15' EACH SIDE OF PIPE CENTERLINE.
8. CONTRACTOR SHALL RESTORE SHELL AND ASPHALT DRIVE TO ORIGINAL CONDITION.



PROFILE

HORZ. 1"=40'
VERT. 1"=10'

[illegible]

DESIGNED BY:	K. LOWE
GRAPH BY:	D. AUST
SHEET CHK'D BY:	C. SCOTT
CROSS CHK'D BY:	K. LOWE
APPROVED BY:	G. CASHON
DATE:	MAY 2014

**CDM
Smith**
1715 North Westshore Blvd., Suite 825
Tampa, FL 33607
Tel: (813) 281-2900
FL CDA No. EB-000020

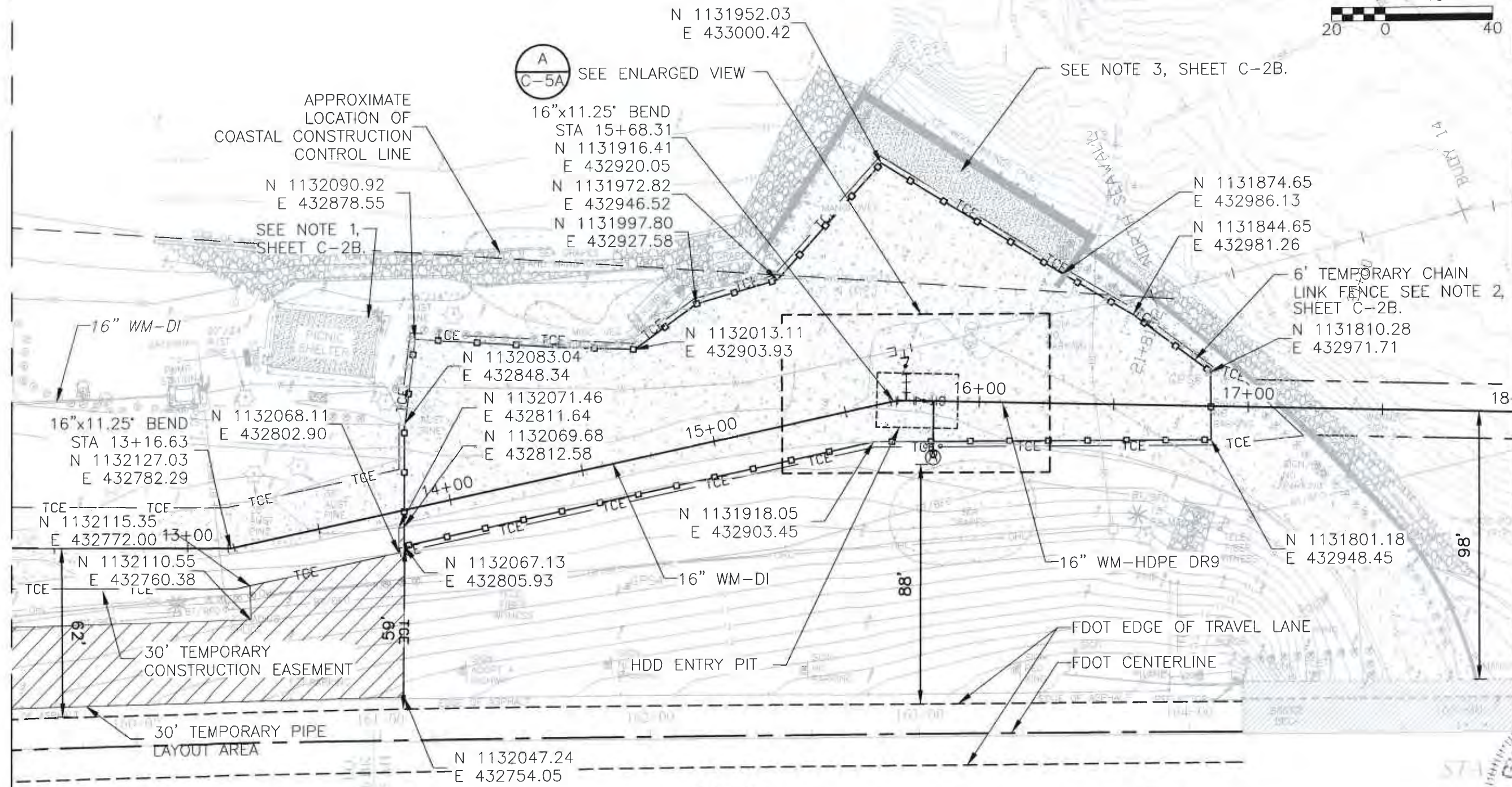
TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

PROFILE
STA. 10+00 TO STA. 12+50

GINA C. CASHIN
LICENSE
No. 43891
★
STATE OF
[Signature]
DATE: 6/20/04
GINA C. CASHIN, P.E.
PE NO. 43891
PROJECT NO. 2790-63746
FILE NAME:
SHEET NO.
C-1C
FOOT PERMIT SUBMITTAL

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MATCHLINE STA. 12+50 SEE SHEET C-1B FOR CONTINUATION



PLAN

1"=40'

NOTE:

FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT)
CENTERLINE AND EDGE OF TRAVEL LANE
INFORMATION TAKEN FROM DATA FILES PROVIDED
BY FDOT SURVEYING & MAPPING DEPARTMENT.

REV.	DATE	DRAWN	CHKD	REMARKS

DESIGNED BY: K. LOWE
DRAWN BY: D. AUST
SHEET CHECKED BY: C. SCOTT
CROSS CHECKED BY: K. LOWE
APPROVED BY: G. CASHION
DATE: MAY 2014

CDM Smith
1715 North Westshore Blvd., Suite 1775
Tampa, FL 33607
Tel: (813) 201-2900
Fl. CDA No. EB-0005030

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

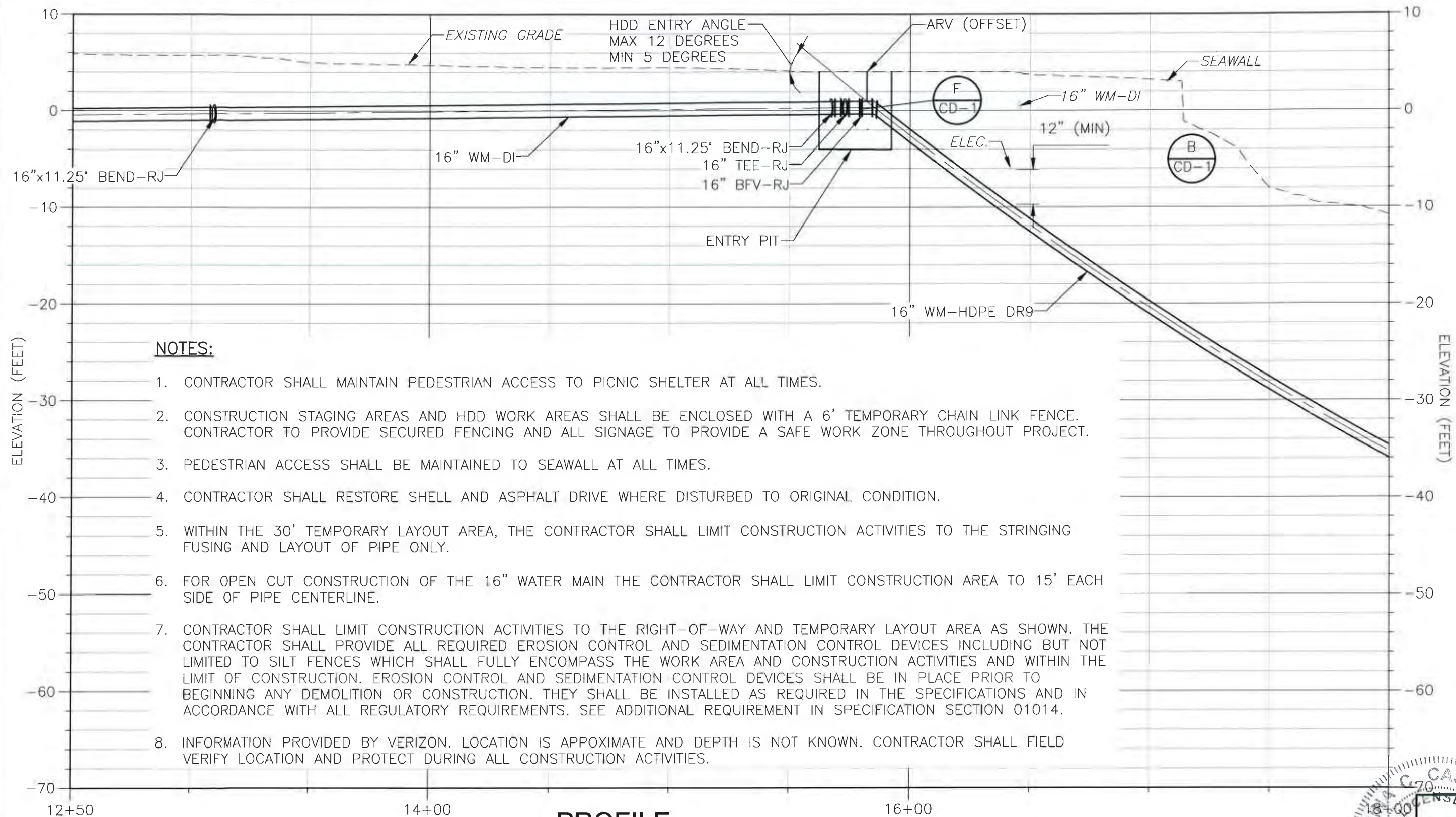
PLAN
STA. 12+00 TO STA. 18+00

PROJECT NO. 2790-83746
FILE NAME:
SHEET NO.
C-2A

MATCHLINE STA. 18+00 SEE C-2C FOR CONTINUATION

FDOT PERMIT SUBMITTAL

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PROFILE

HORZ. 1"=40'
VERT. 1"=10'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:	K. LOWE
DRAWN BY:	D. AUST
SHEET CHK'D BY:	C. SCOTT
CROSS CHK'D BY:	K. LOWE
APPROVED BY:	G. CASHION
DATE:	MAY 2014



TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

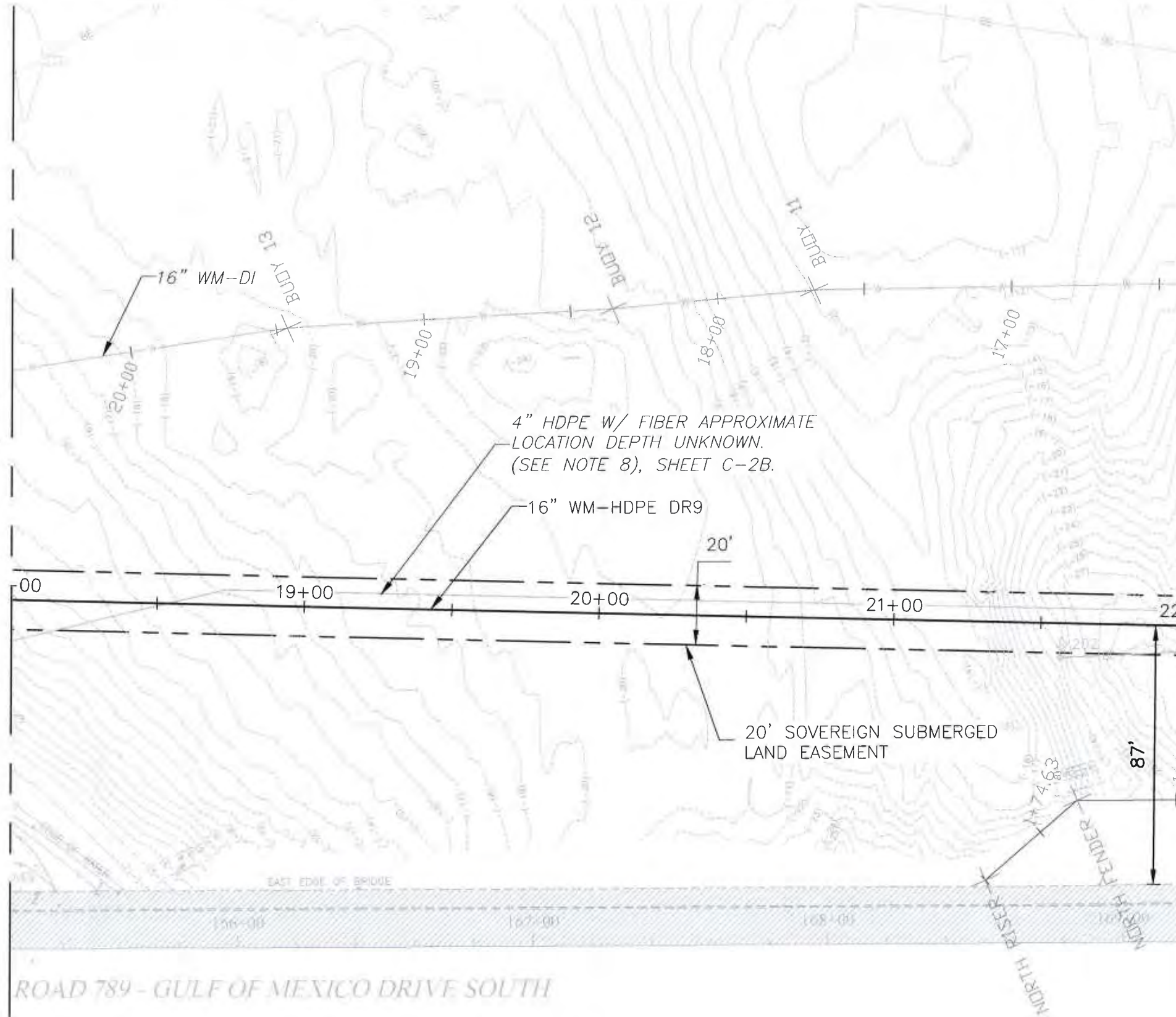
PROFILE
STA. 12+00 TO STA. 18+00

PROJECT NO.	2790-83746
FILE NAME:	
SHEET NO.	C-2B

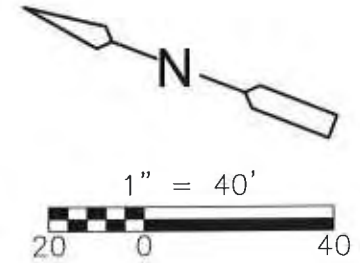


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MATCHLINE STA. 18+00 SEE SHEET C-2A FOR CONTINUATION



MATCHLINE STA. 22+00 SEE C-2E FOR CONTINUATION



PLAN

1"=40'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. LOWE
DRAWN BY: D. AUST
SHEET CHK'D BY: G. SCOTT
CROSS CHK'D BY: K. LOWE
APPROVED BY: G. CASHON
DATE: MAY 2014

CDM Smith
1715 North Westshore Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 281-2900
FL COA No. EB-0000020

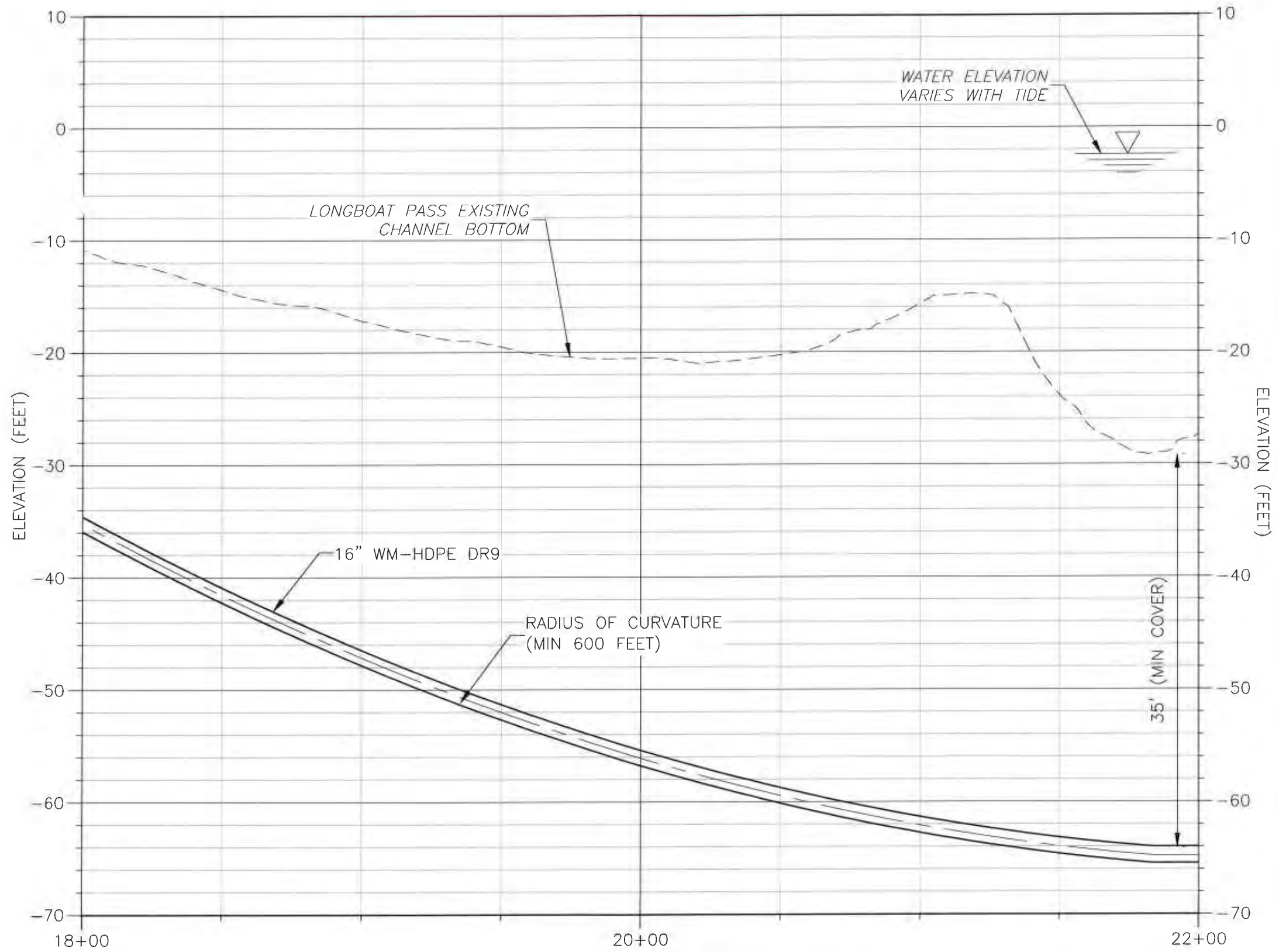
TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

PLAN
STA. 18+00 TO 22+00

Professional Engineer Seal for Gina C. Cashon, P.E., License No. 43891, State of Florida. The seal includes the text 'STATE OF FLORIDA', 'PROFESSIONAL ENGINEER', 'GINA C. CASHON, P.E.', 'No. 43891', and 'DATE: 5/20/14'. Below the seal, the project information is listed: PROJECT NO. 2790-83746, FILE NAME: C-2C, and SHEET NO. C-2C.

FOOT PERMIT SUBMITTAL

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PROFILE

HORZ. 1"=40'
VERT. 1"=10'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. LOWE	CDM Smith 1715 North Westshore Blvd., Suite 875 Tampa, FL 33607 Tel: (813) 281-2900 FL CDA No. 12B-0001020
DRAWN BY: D. AUST	
SHEET CHK'D BY: C. SCOTT	
CROSS CHK'D BY: K. LOWE	
APPROVED BY: G. CASHON	
DATE: MAY 2014	

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

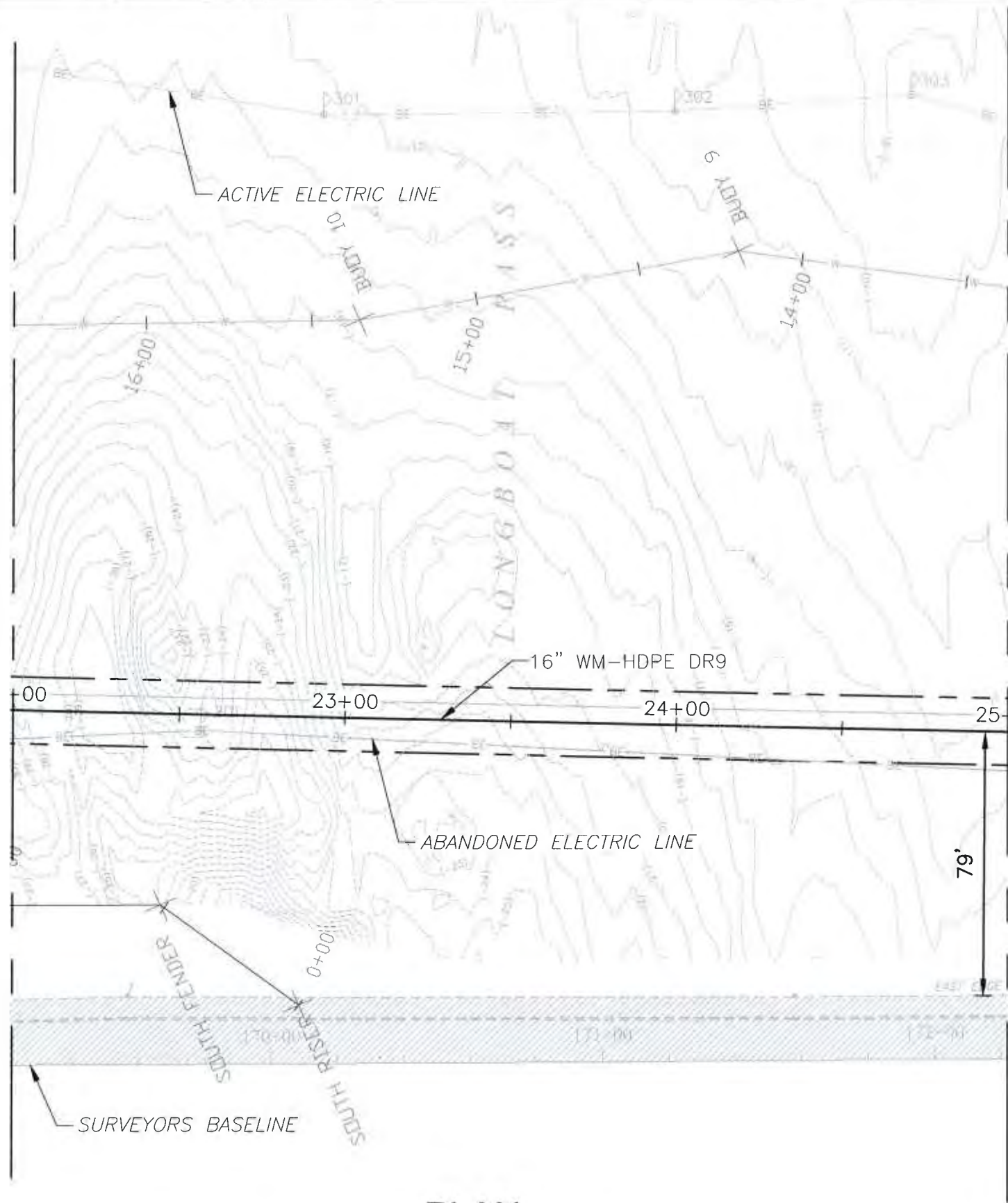
PROFILE
STA. 18+00 TO STA. 22+00

Professional Engineer Seal for Gina C. Cashon, No. 43891, State of Florida.

PROJECT NO. 2790-83746
SHEET NO. C-2D

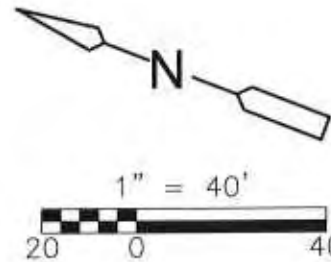
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MATCHLINE STA. 18+00 SEE C-2C FOR CONTINUATION



PLAN

1"=40'



MATCHLINE STA. 25+00 SEE C-3A FOR CONTINUATION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. LOWE	CDM Smith 1715 North Westshore Blvd., Suite B75 Tampa, FL 33607 Tel: (813) 281-2900 FL CCA No. ES-0000020
DRAWN BY: D. AUST	
SHEET CHK'D BY: C. SCOTT	
CROSS CHK'D BY: K. LOWE	
APPROVED BY: G. CASHON	
DATE: MAY 2014	

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

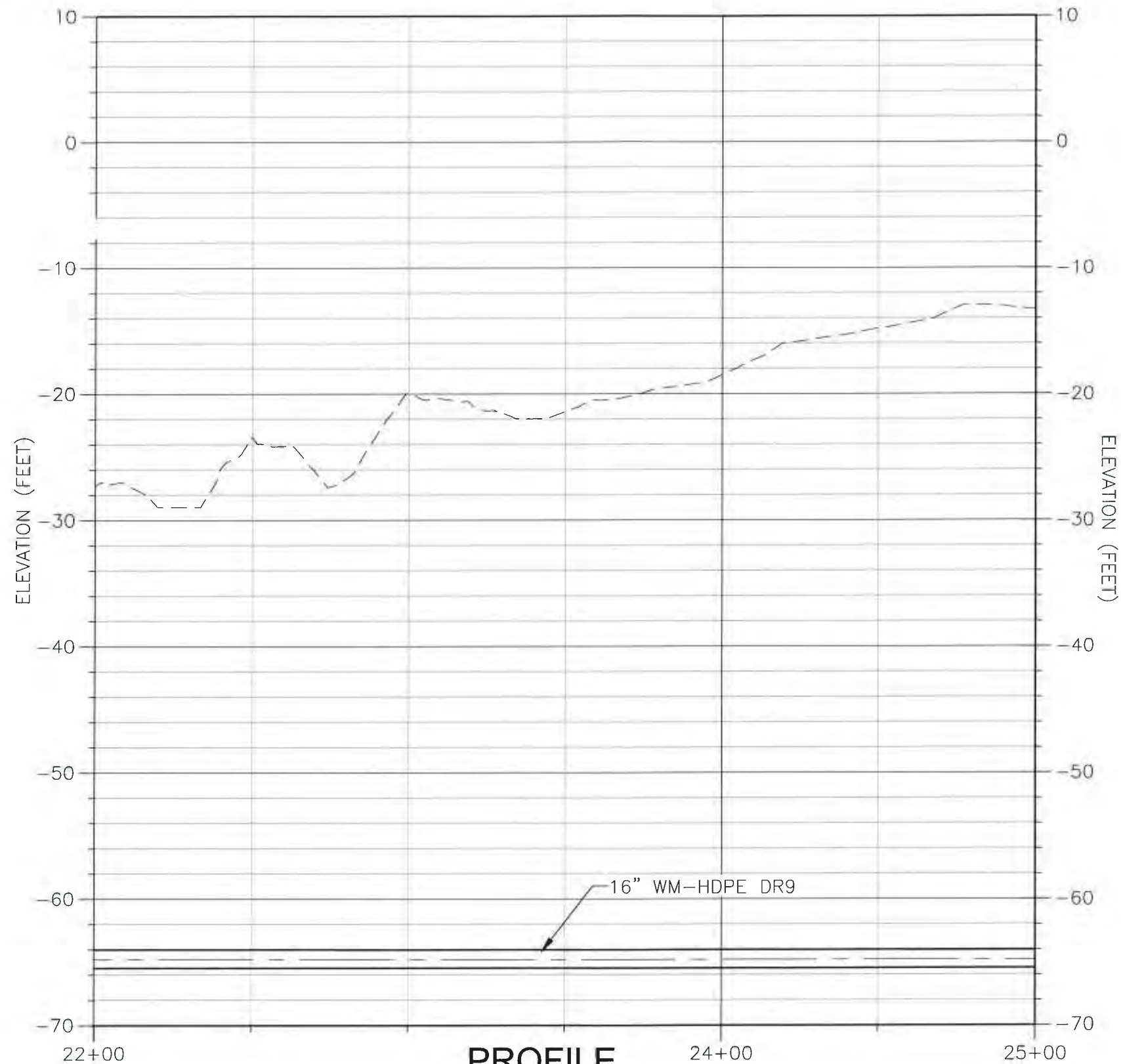
PLAN
STA. 22+00 TO 25+00



PROJECT NO. 2790-83746
FILE NAME
SHEET NO.
C-2E

FOOT PERMIT SUBMITTAL

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PROFILE

HORZ. 1"=40'
VERT. 1"=10'

REV. NO.	DATE	DRWN	CHKD	REMARKS

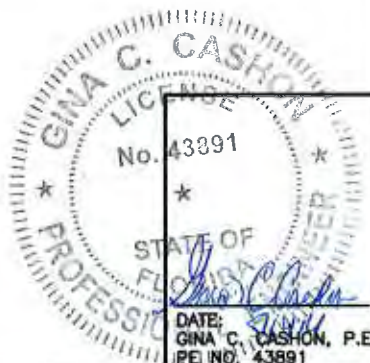
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DRAWN BY:	D. AUST
SHEET CHK'D BY:	G. SCOTT
CROSS CHK'D BY:	K. LOWE
APPROVED BY:	G. CASHON
DATE:	MAY 2014

CDM Smith
1715 North Westshore Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 281-2500
FL CCA No. EB-0000000

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

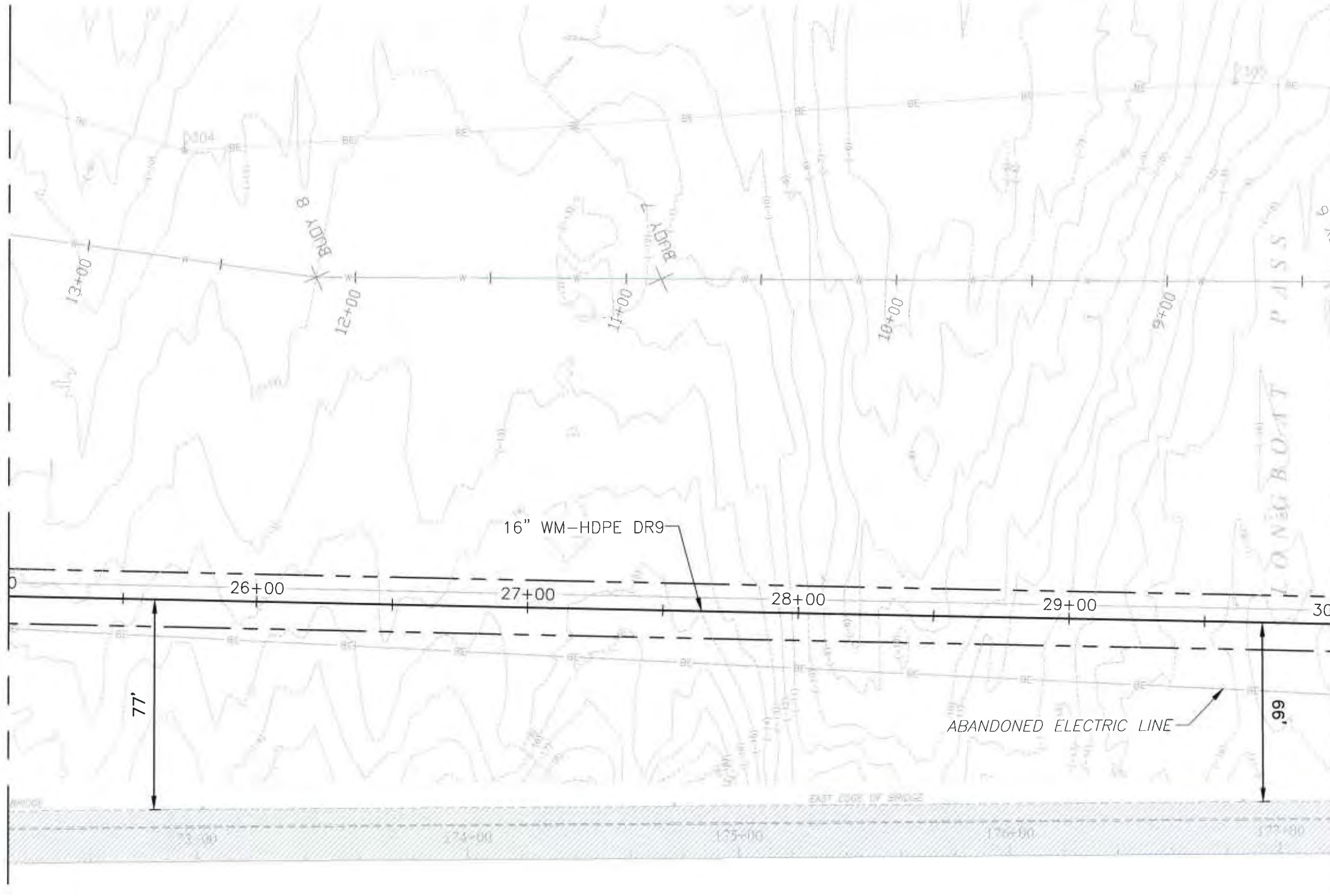
PROFILE
STA. 22+00 TO STA. 25+00

PROJECT NO.	2790-63746
FILE NAME:	
SHEET NO.	C-2F

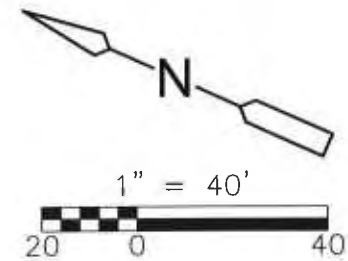


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MATCHLINE STA. 25+00 SEE C-2E FOR CONTINUATION



MATCHLINE STA. 30+00 SEE C-3C FOR CONTINUATION



PLAN

1"=40'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. LOME
DRAWN BY: D. AUST
SHEET CHK'D BY: C. SCOTT
CROSS CHK'D BY: K. LOME
APPROVED BY: G. CASHON
DATE: MAY 2014

CDM Smith
1715 North Westshore Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 281-2900
FL COA No. EB-0000020

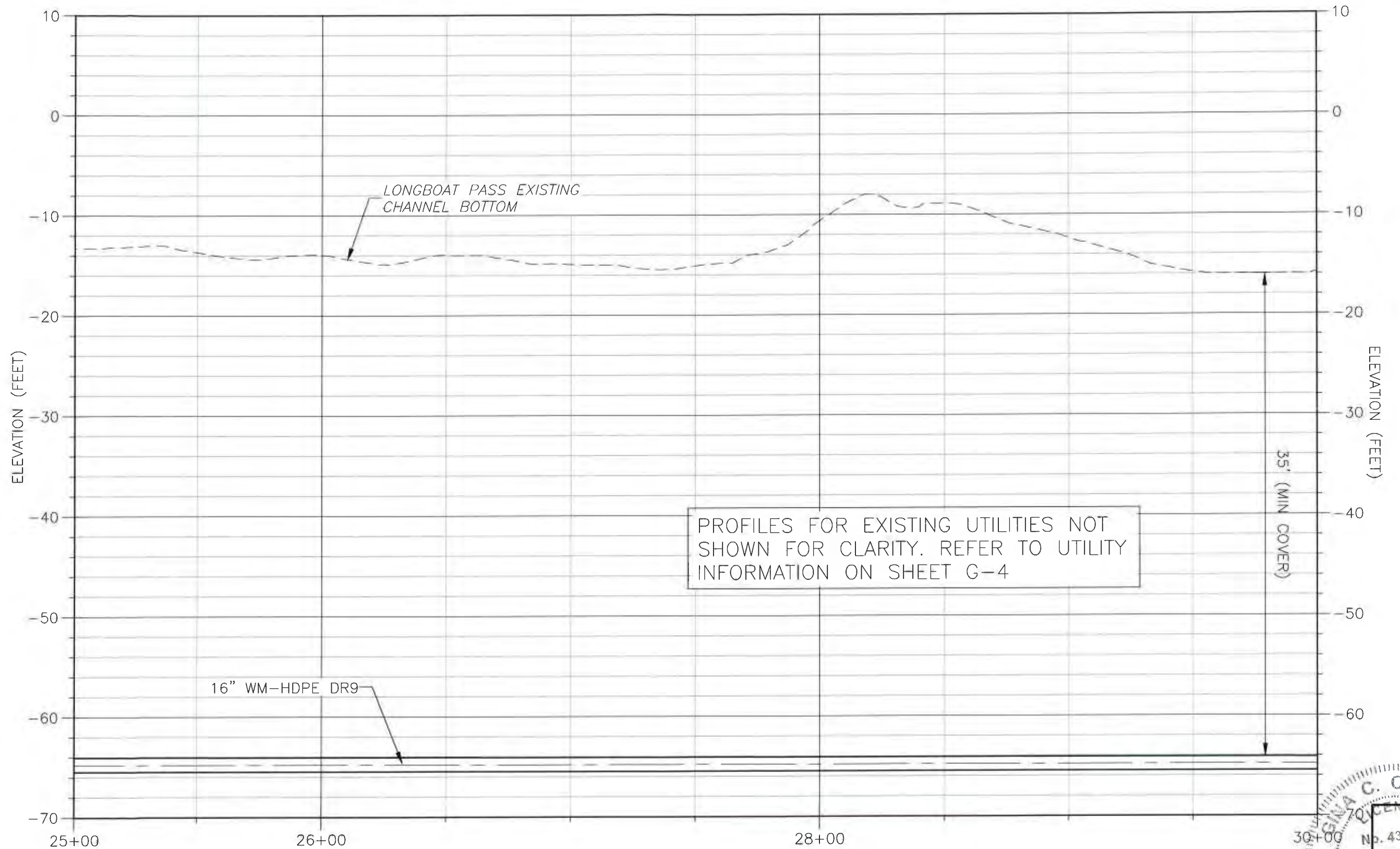
TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

PLAN
STA. 25+00 TO STA. 30+00

GINA C. CASHON
LICENSE
No. 43891
STATE OF FLORIDA
PROFESSIONAL ENGINEER
DATE: MAY 2014
GINA C. CASHON, P.E.
PE NO. 43891
PROJECT NO. 2790-83746
SHEET NO.
C-3A

NOT PERMIT SUBMITTAL

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PROFILE

HORZ. 1"=40'
VERT. 1"=10'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:	K. LOWE
DRAWN BY:	D. AUST
SHEET CHK'D BY:	G. SCOTT
CROSS CHK'D BY:	K. LOWE
APPROVED BY:	G. CASHON
DATE:	MAY 2014

CDM Smith
1715 North Westshore Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 281-2900
FL CCA No. 18-000020

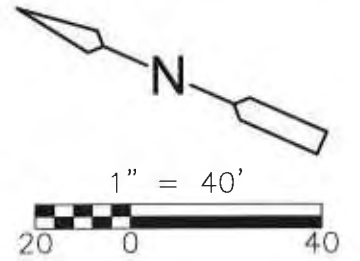
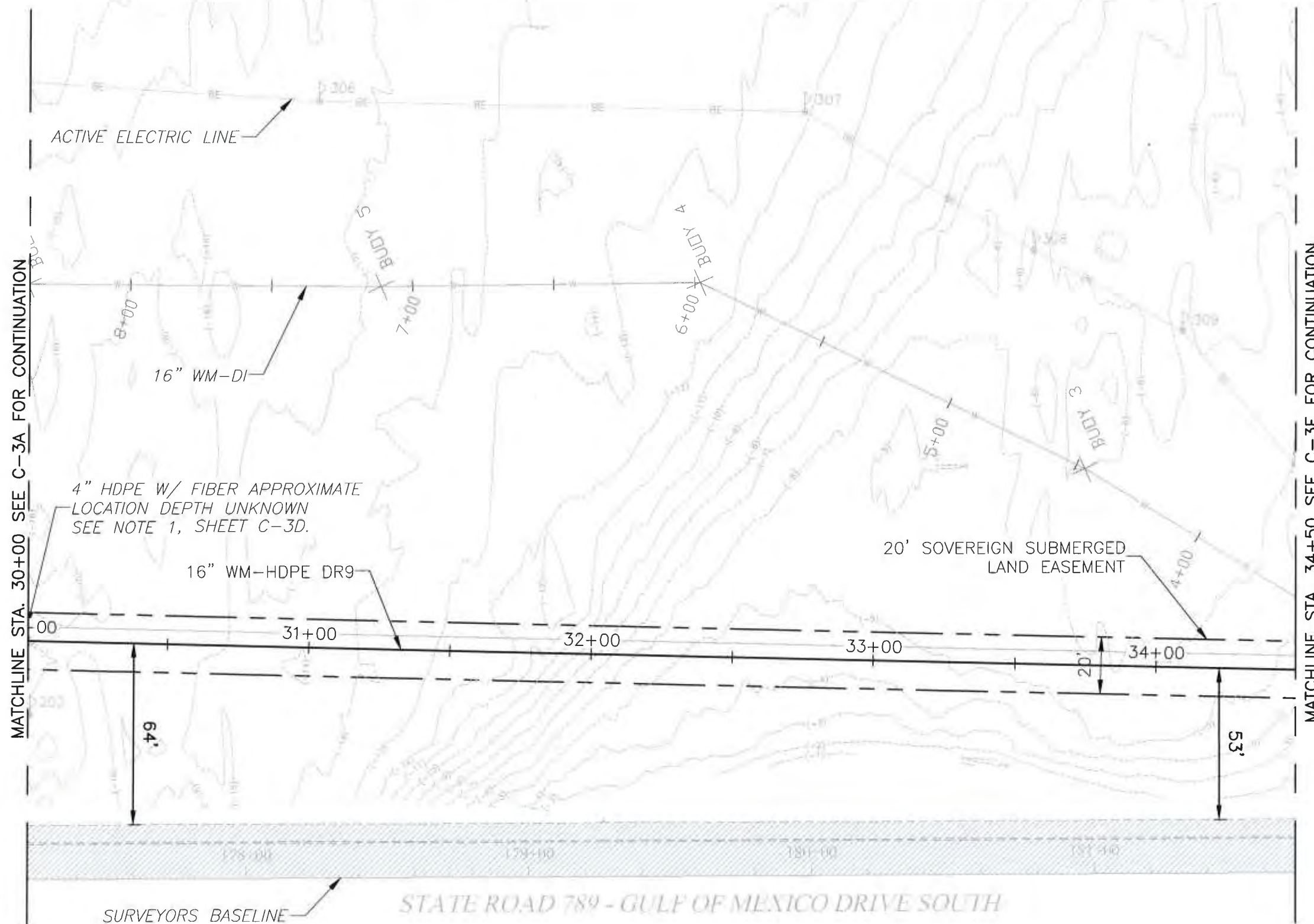
TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

PROFILE
STA. 25+00 TO STA. 30+00

PROJECT NO. 2780-83746
SHEET NO.
C-3B



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SURVEYORS BASELINE

STATE ROAD 789 - GULF OF MEXICO DRIVE SOUTH

MATCHLINE STA. 34+50 SEE C-3E FOR CONTINUATION

MATCHLINE STA. 30+00 SEE C-3A FOR CONTINUATION

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

PLAN
STA. 30+00 TO STA. 34+50

C-3C



DESIGNED BY: K. LOWE
DRAWN BY: D. AUST
SHEET CHK'D BY: C. SCOTT
CROSS CHK'D BY: K. LOWE
APPROVED BY: G. CASHON
DATE: MAY 2014

**CDM
Smith**

1715 North Westshore Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 261-2900
FL CCA No. 05-0000220

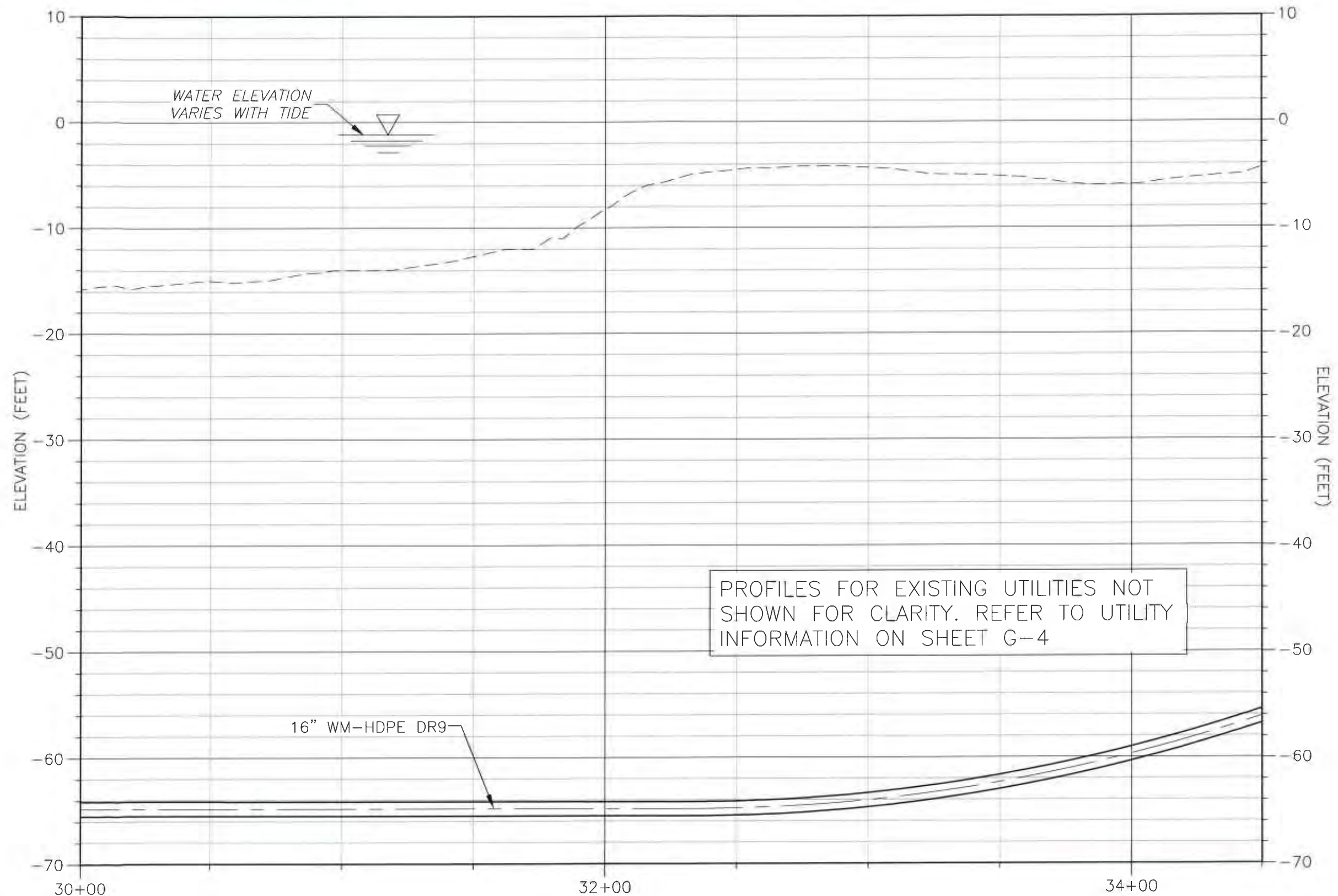
REV.	NO.	DATE	DRWN	CHKD	REMARKS

PROJECT NO. 2790-83746

FILE NAME:

SHEET NO.

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NOTE:

1. INFORMATION PROVIDED BY VERIZON. LOCATION IS APPROXIMATE AND DEPTH IS NOT KNOWN. CONTRACTOR SHALL FIELD VERIFY LOCATION AND PROTECT DURING ALL CONSTRUCTION ACTIVITIES.

PROFILE

HORZ. 1"=40'
VERT. 1"=10'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. LOWE
DRAWN BY: D. AUST
SHEET CHK'D BY: C. SCOTT
CROSS CHK'D BY: K. LOWE
APPROVED BY: G. CASHON
DATE: MAY 2014

CDM Smith
1715 North Westshore Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 281-2900
FL CEA No. EB-0000000

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

PROFILE
STA. 30+00 TO STA. 34+50

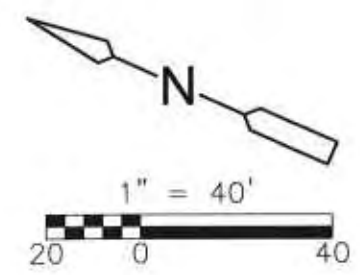
GINA C. CASHON
LICENSE
No. 43891
STATE OF
DATE: 5/14/14
GINA C. CASHON, P.E.
PE NO. 43891
PROJECT NO. 2790-63746
SHEET NO.
C-3D

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MATCHLINE STA. 34+50 SEE C-3C FOR CONTINUATION



MATCHLINE STA. 37+50 SEE C-4A FOR CONTINUATION



PLAN
1"=40'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:	K. LOWE
DRAWN BY:	D. AUST
SHEET CHK'D BY:	C. SCOTT
CROSS CHK'D BY:	K. LOWE
APPROVED BY:	G. CASHION
DATE:	MAY 2014

CDM Smith
1715 North Westshore Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 281-2900
FL CEA No. EB-00000000

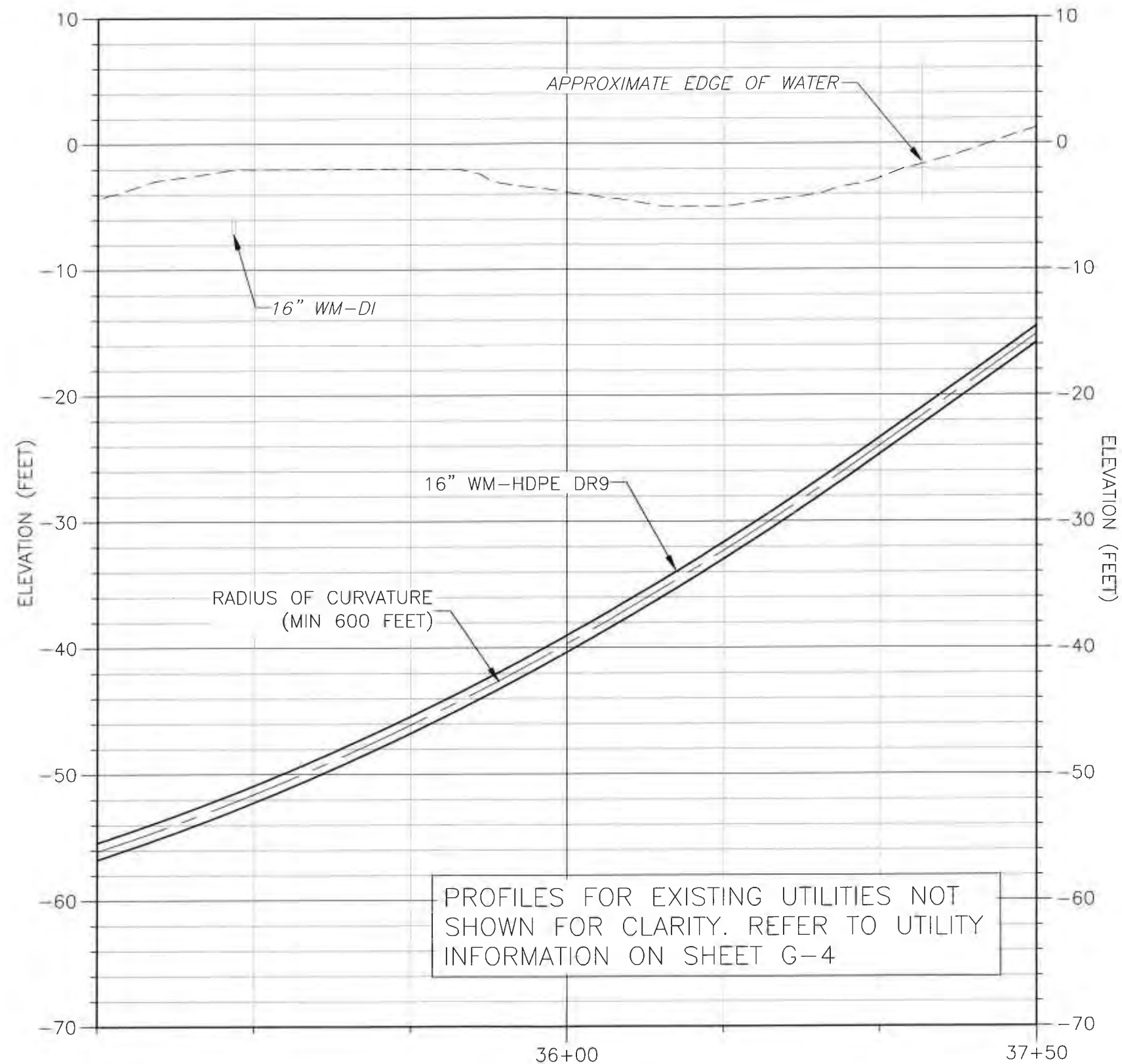
TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

PLAN
STA. 34+50 TO STA. 37+50

Professional Engineer Seal for Gina C. Cashion, No. 43891, State of Florida. The seal includes the text 'STATE OF FLORIDA', 'PROFESSIONAL ENGINEER', 'GINA C. CASHION', 'No. 43891', and 'DATE: MAY 2014'.

PROJECT NO.	2790-83746
FILE NAME:	
SHEET NO.	C-3E

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NOTE:

1. INFORMATION PROVIDED BY VERIZON. LOCATION IS APPROXIMATE AND DEPTH IS NOT KNOWN. CONTRACTOR SHALL FIELD VERIFY LOCATION AND PROTECT DURING ALL CONSTRUCTION ACTIVITIES.

PROFILE

HORZ. 1"=40'
VERT. 1"=10'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. LOWE
DRAWN BY: D. AUST
SHEET CHECKED BY: G. SCOTT
CROSS CHECKED BY: K. LOWE
APPROVED BY: G. CASHON
DATE: MAY 2014

CDM Smith
1715 North Westshore Blvd., Suite 875
Tampa, FL 33607
Tel: (813) 281-2800
FL CDA No. EB-0000020

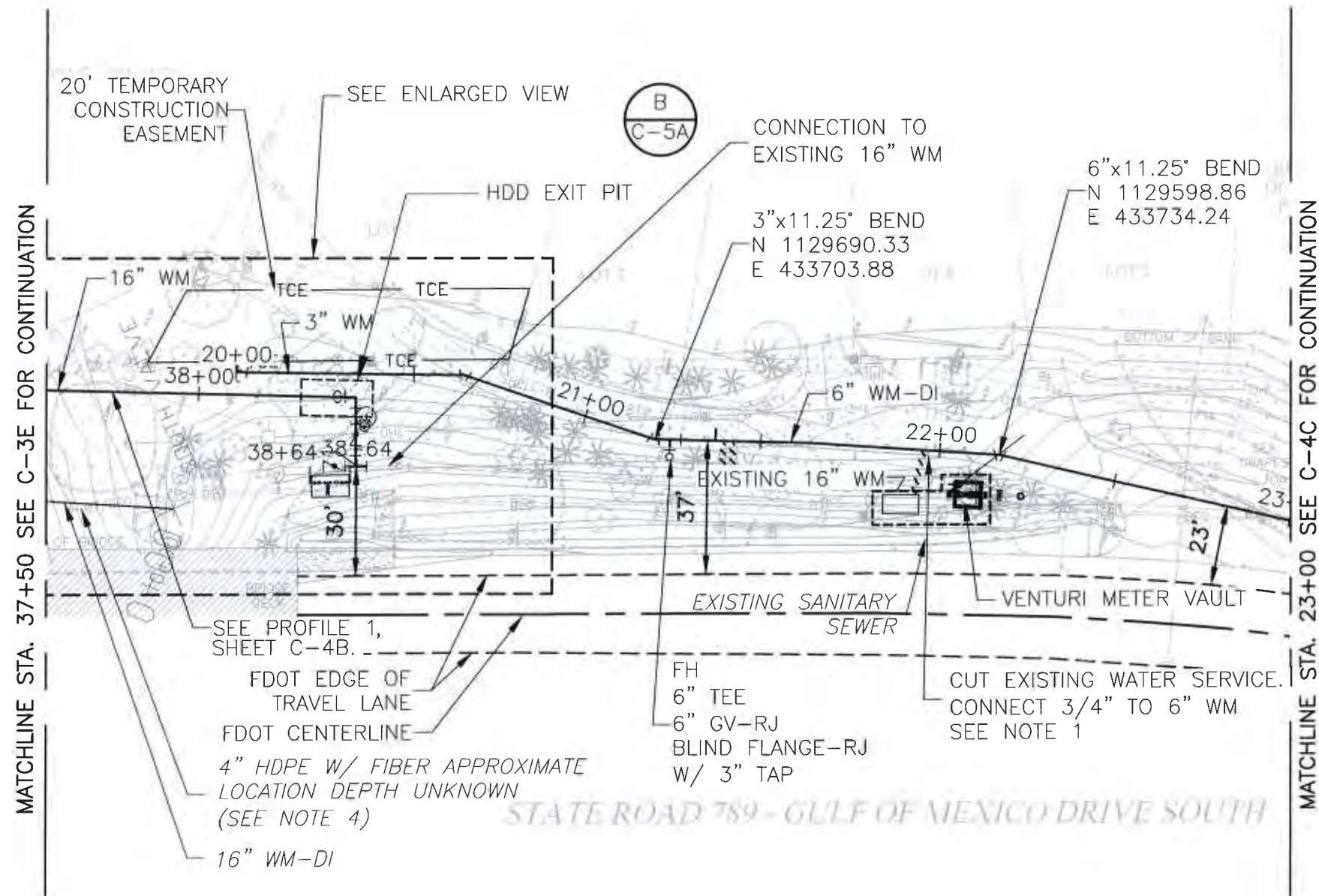
TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

PROFILE
STA. 34+50 TO STA. 37+50



NOT PERMIT SUBMITTAL

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PLAN

1"=40'

NOTE:

FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) CENTERLINE AND EDGE OF TRAVEL LANE INFORMATION TAKEN FROM DATA FILES PROVIDED BY FDOT SURVEYING & MAPPING DEPARTMENT.

NOTES:

1. AS EXISTING WATER SERVICE CONNECTIONS ARE MOVED TO THE NEW 6"/3" WATER MAIN, ALL PREVIOUS CONNECTIONS TO THE EXISTING 16" WM SHALL BE REMOVED AND PLUGGED AT THE EXISTING 16" WM. PORTIONS OF WATER SERVICE LINES NO LONGER IN SERVICE SHALL BE REMOVED.
2. PARKING ON STATE RIGHT OF WAY IS LIMITED TO ONE WORK TRUCK AND REQUIRED CONSTRUCTION EQUIPMENT. STAGING OF IDLE EQUIPMENT WILL NOT BE PERMITTED.
3. CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITIES TO THE RIGHT OF WAY AND TEMPORARY CONSTRUCTION EASEMENT. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED EROSION CONTROL AND SEDIMENTATION CONTROL DEVICES INCLUDING BUT NOT LIMITED TO SILT FENCES WHICH SHALL FULLY ENCOMPASS THE WORK AREA AND CONSTRUCTION ACTIVITIES AND BE WITHIN THE LIMIT OF CONSTRUCTION. EROSION CONTROL AND SEDIMENTATION CONTROL DEVICES SHALL BE IN PLACE PRIOR TO BEGINNING ANY DEMOLITION OR CONSTRUCTION. THEY SHALL BE INSTALLED AS REQUIRED IN THE SPECIFICATIONS AND IN ACCORDANCE WITH ALL REGULATORY REQUIREMENTS. SEE ADDITIONAL REQUIREMENTS IN SPECIFICATIONS SECTION 01014.
4. INFORMATION PROVIDED BY VERIZON. LOCATION IS APPROXIMATE AND DEPTH IS NOT KNOWN. CONTRACTOR SHALL FIELD VERIFY LOCATION AND PROTECT DURING ALL CONSTRUCTION ACTIVITIES.
5. CONTRACTOR SHALL RESTORE SHELL AND ASPHALT DRIVE WHERE DISTURBED TO ORIGINAL CONDITION.

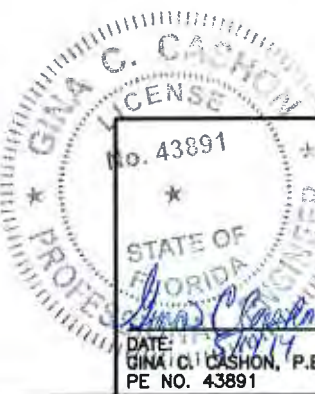
REV.	NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. LOMB	1715 North Westshore Blvd., Suite 675
DRAWN BY: D. AUST	Tampa, FL 33607
SHEET CHECKED BY: C. SCOTT	Tel: (813) 281-2800
CROSS CHECKED BY: K. LOMB	FL COA No. EB-020020
APPROVED BY: G. CASHON	
DATE: MAY 2014	



TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

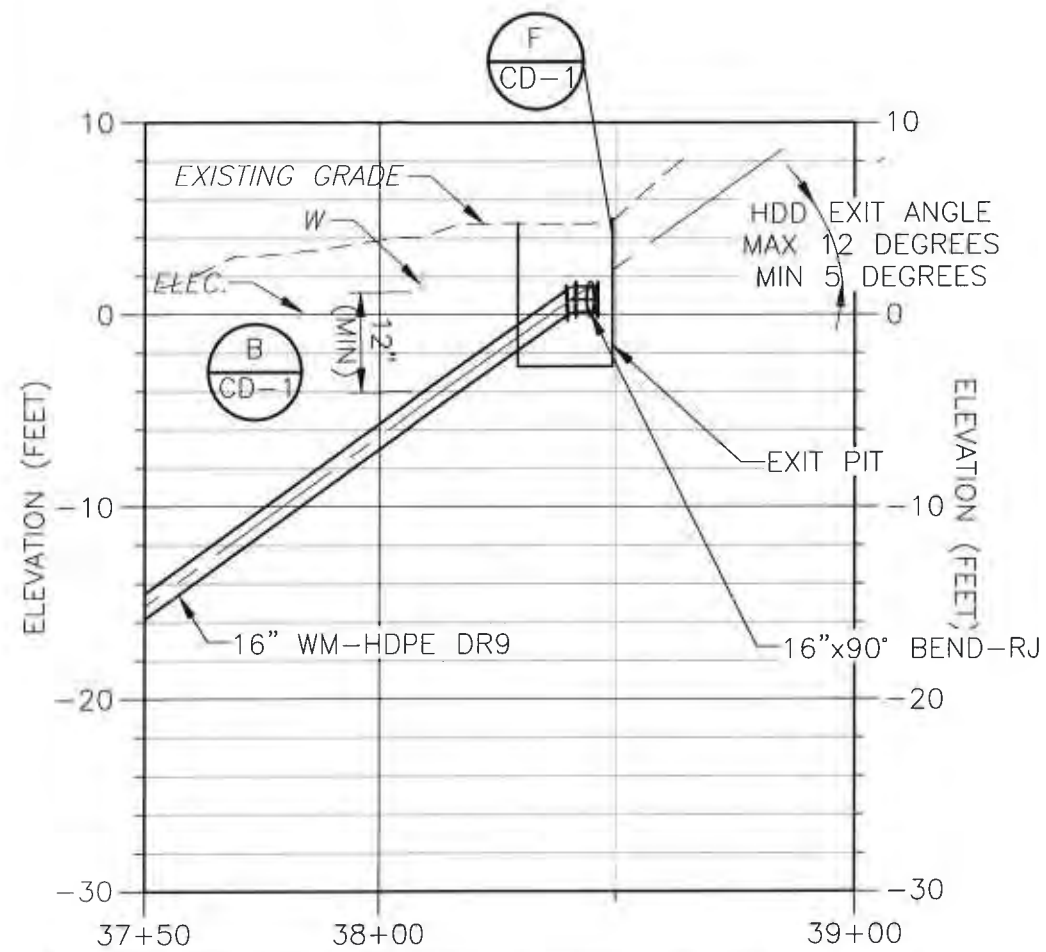
PLAN
STA. 37+50 TO STA. 38+64
AND
STA. 20+00 TO STA. 23+00



PROJECT NO. 2790-83746
FILE NAME:
SHEET NO.
C-4A

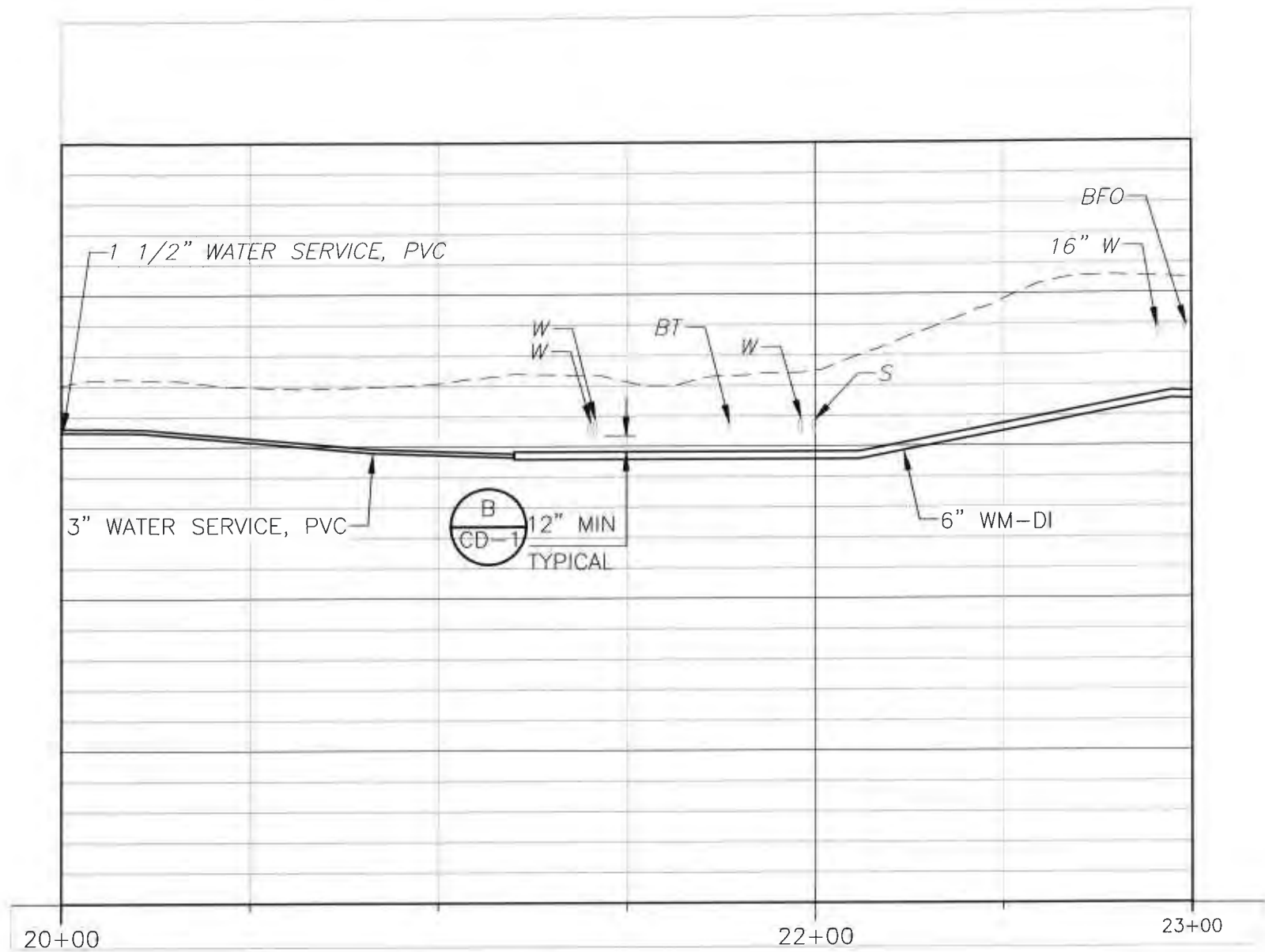
FDOT PERMIT SUBMITTAL

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PROFILES FOR EXISTING UTILITIES NOT SHOWN FOR CLARITY. REFER TO UTILITY INFORMATION ON SHEET G-4

HDD TO EXIT PIT
PROFILE 1
HORZ. 1"=40'
VERT. 1"=10'



6" WATERMAIN FROM EXISTING 1 1/2" WATER SERVICE TO PRESSURE REDUCING STATION
PROFILE 2
HORZ. 1"=40'
VERT. 1"=10'

DESIGNED BY: H. LOME	CDM Smith
DRAWN BY: D. ALST	
SHEET CHK'D BY: C. SCOTT	
CROSS CHK'D BY: H. LOME	
APPROVED BY: G. CASHON	
DATE: MAY 2014	

REV.	NO.	DATE	DRWN	CHKD	REMARKS

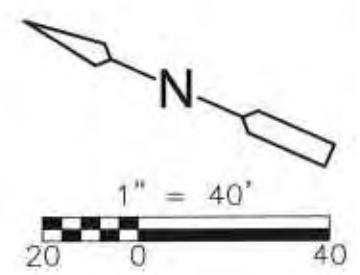
TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

PROFILE
STA. 37+50 TO STA. 39+00
AND
STA. 20+00 TO STA. 23+00

GINA C. CASHON
LICENSE
No. 43891
STATE OF
FLORIDA
DATE: 5/1/14
GINA C. CASHON, P.E.
PE NO. 43891
PROJECT NO. 2790-83746
FILE NAME:
SHEET NO.
C-4B

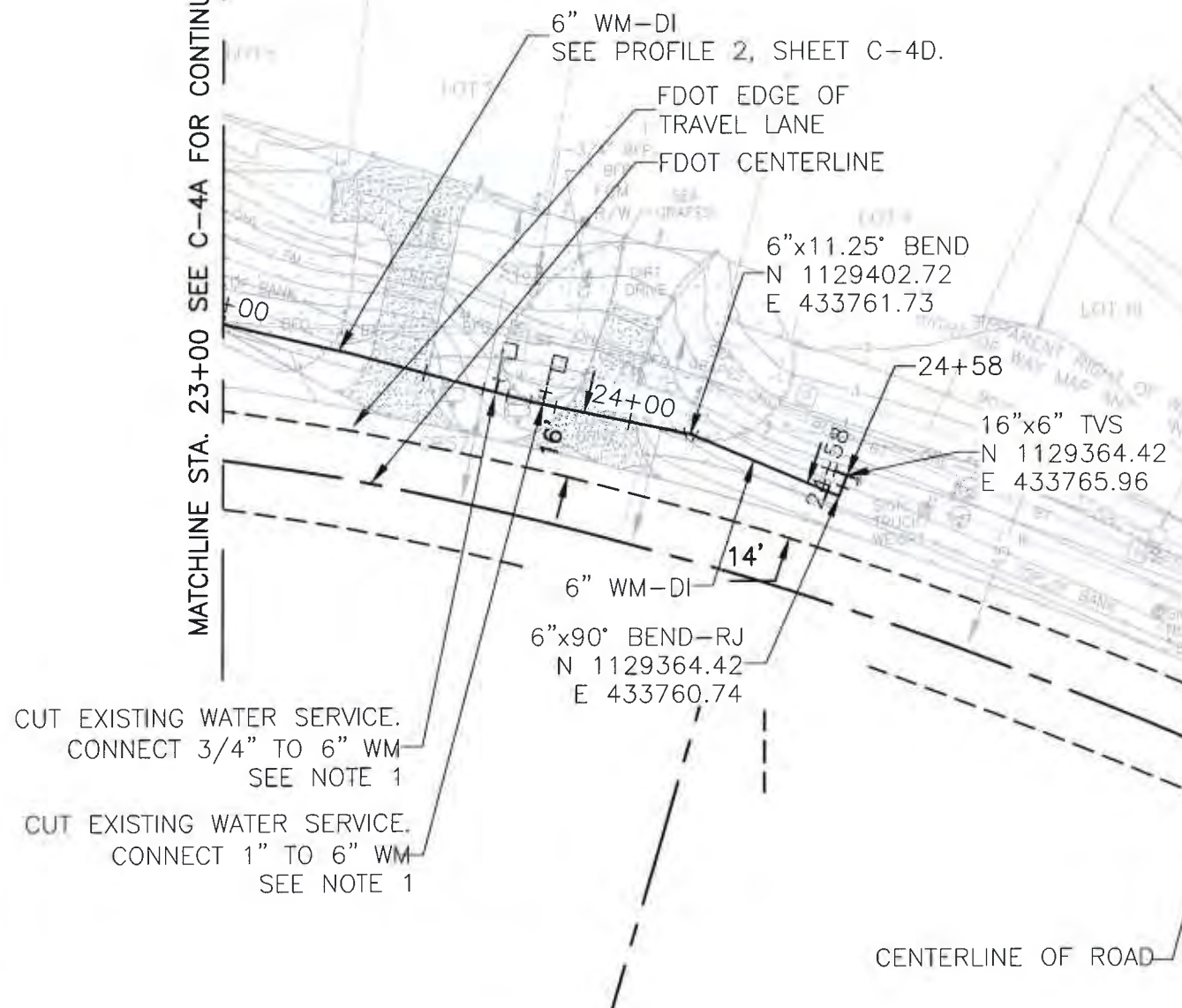
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MATCHLINE STA. 23+00 SEE C-4A FOR CONTINUATION



NOTES:

1. AS EXISTING WATER SERVICE CONNECTIONS ARE MOVED TO THE NEW 6"/3" WATER MAIN, ALL PREVIOUS CONNECTIONS TO THE EXISTING 16" WM SHALL BE REMOVED AND PLUGGED AT THE EXISTING 16" WM. PORTIONS OF WATER SERVICE LINES NO LONGER IN SERVICE SHALL BE REMOVED.
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5. CONTRACTOR SHALL RESTORE SHELL AND ASPHALT DRIVE WHERE DISTURBED TO ORIGINAL CONDITION.



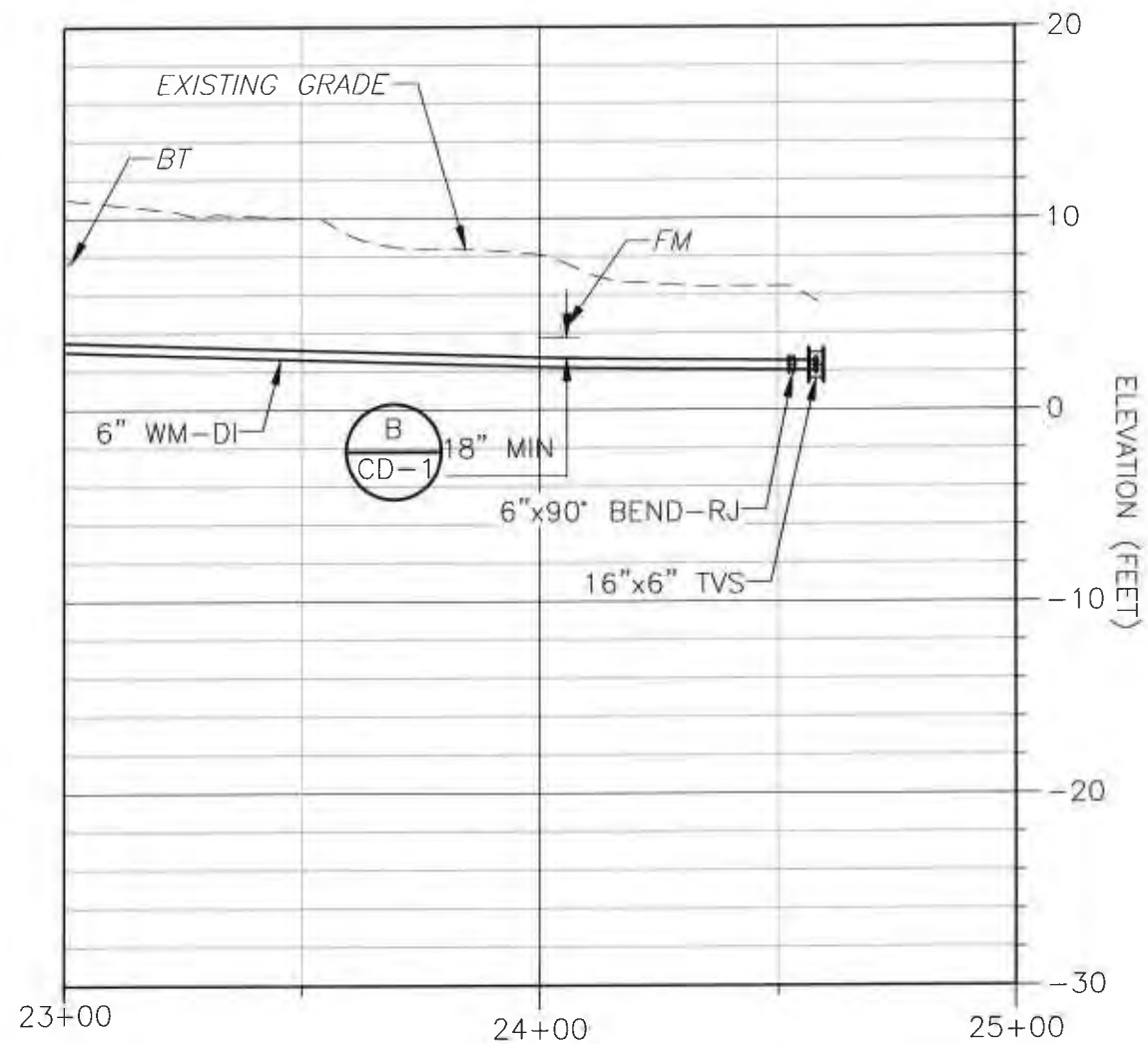
PLAN
1"=40'

NOTE:

FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT)
CENTERLINE AND EDGE OF TRAVEL LANE
INFORMATION TAKEN FROM DATA FILES PROVIDED
BY FDOT SURVEYING & MAPPING DEPARTMENT.

<table border="1"><thead><tr><th>REV.</th><th>NO.</th><th>DATE</th><th>DRWN</th><th>CHKD</th><th>REMARKS</th></tr></thead><tbody><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></tbody></table>				REV.	NO.	DATE	DRWN	CHKD	REMARKS																									<table border="1"><tr><td>DESIGNED BY: K. LOWE</td><td rowspan="5">CDM Smith 1715 North Westshore Blvd., Suite 875 Tampa, FL 33607 Tel: (813) 267-2600 FL CDA No. EB-0000020</td></tr><tr><td>DRAWN BY: D. AUST</td></tr><tr><td>SHEET CHK'D BY: C. SCOTT</td></tr><tr><td>CROSS CHK'D BY: K. LOWE</td></tr><tr><td>APPROVED BY: G. CASHON</td></tr><tr><td colspan="2">DATE: MAY 2014</td></tr></table>		DESIGNED BY: K. LOWE	CDM Smith 1715 North Westshore Blvd., Suite 875 Tampa, FL 33607 Tel: (813) 267-2600 FL CDA No. EB-0000020	DRAWN BY: D. AUST	SHEET CHK'D BY: C. SCOTT	CROSS CHK'D BY: K. LOWE	APPROVED BY: G. CASHON	DATE: MAY 2014		TOWN OF LONGBOAT KEY, FLORIDA POTABLE WATER SYSTEM SUBAQUEOUS CROSSING OF LONGBOAT PASS AND SYSTEM PRESSURE CONTROLS		PLAN STA. 23+00 TO STA. 26+53		<table border="1"><tr><td colspan="2">Gina C. CASHON, P.E. No. 43391 STATE OF FLORIDA</td></tr><tr><td>PROJECT NO. 2790-B3746</td><td>FILE NAME:</td></tr><tr><td colspan="2">SHEET NO. C-4C</td></tr></table>		Gina C. CASHON, P.E. No. 43391 STATE OF FLORIDA		PROJECT NO. 2790-B3746	FILE NAME:	SHEET NO. C-4C	
REV.	NO.	DATE	DRWN	CHKD	REMARKS																																																		
DESIGNED BY: K. LOWE	CDM Smith 1715 North Westshore Blvd., Suite 875 Tampa, FL 33607 Tel: (813) 267-2600 FL CDA No. EB-0000020																																																						
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6" WATERMAIN FROM EXISTING 1 1/2" WATER
SERVICE TO PRESSURE REDUCING STATION

PROFILE

HORIZ. 1"=40'
VERT. 1"=10'



REV. NO.	DATE	DRAWN	CHKD	REMARKS

DESIGNED BY: K. LONE
DRAWN BY: D. AUST
SHEET CHK'D BY: C. SCOTT
CROSS CHK'D BY: K. LONE
APPROVED BY: G. CASHON
DATE: MAY 2014

CDM Smith
1715 North Westshore Blvd., Suite 815
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Tel: (813) 281-2500
FL COA No. EB-0002020

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

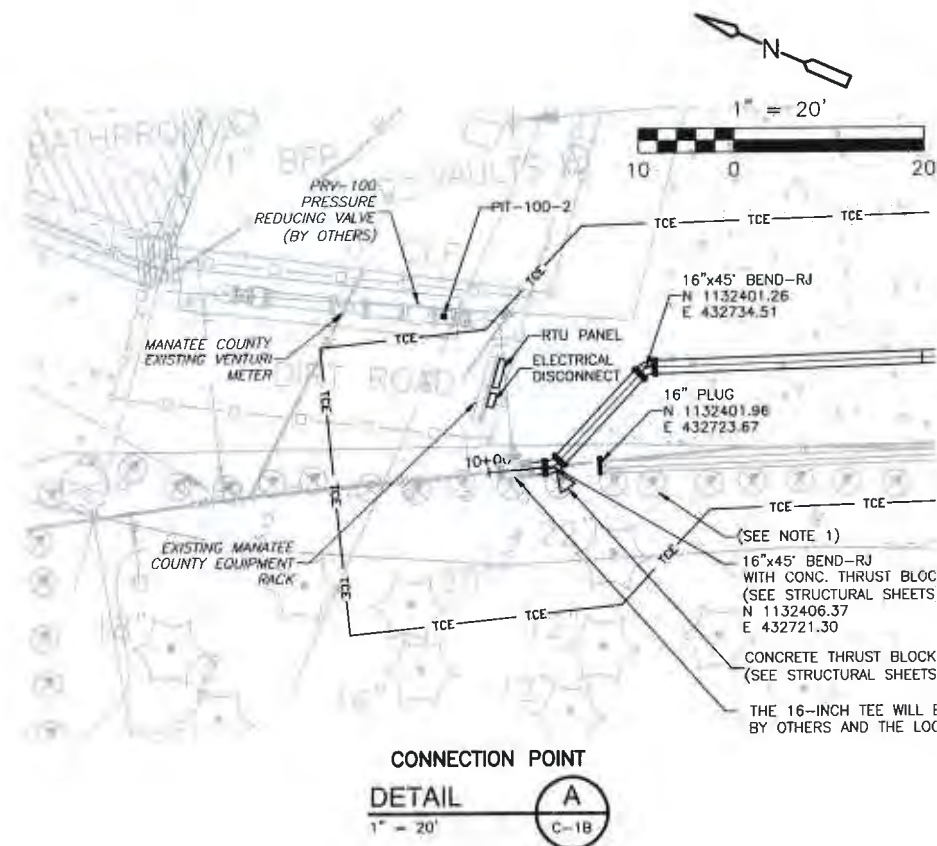
PROFILE
STA. 23+00 TO STA. 27+00

PROJECT NO. 2790-83746
FILE NAME:
SHEET NO.
C-4D

END PERMIT SUBMITTAL

ΕΝΟΤ ΠΕΡΙΜΙΤ ΣΙ ΙΡΜΙΤΤΑΙ

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DESIGNED BY: K. LOWE	CDM Smith 1715 North Westshore Blvd., Suite 675 Tampa, FL 33607 Tel: (813) 281-2900 FL COA No. EB-0900020
DRAWN BY: D. AUST	
SHEET CHECKED BY: C. SCOTT	
CROSS CHECKED BY: K. LOWE	
APPROVED BY: G. CASHON	
DATE: MAY 2014	

TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

ENLARGED SITE PLANS
C-5B

Professional Engineer Seal for Gina C. Cashon, No. 43891, State of Florida. Includes project number 2790-83746 and sheet number C-5B.



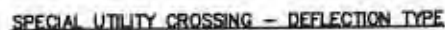
- TYPICAL SECTION FOR FLEXIBLE RESTORATION WITHIN FDOT RIGHT-OF-WAY



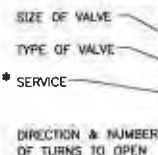
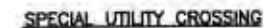
- (UNPAVED AREAS)



-



- ### STANDARD WATER AND SEWER SEPARATION STATEMENT



CONCRETE VALVE PAD/IDENT. DISC.

- ALL METAL FITTINGS AND PIPE WRAPPED WITH MINIMUM 500ML
VISQUEEN.



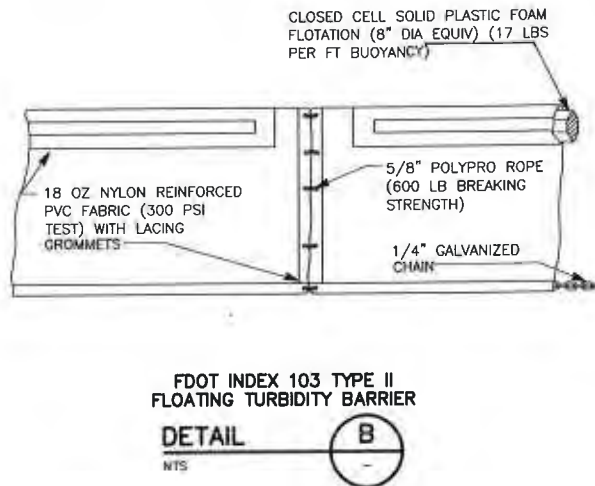
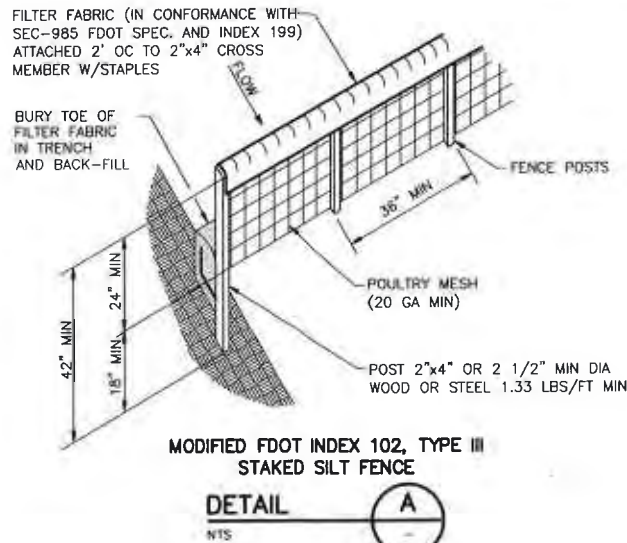
TOWN OF LONGBOAT KEY PUBLIC WORKS



DETAIL



XREFs: [CDNS 2234] Images: [1] Last saved by: AUSTUD Time: 5/7/2014 8:56:13 AM
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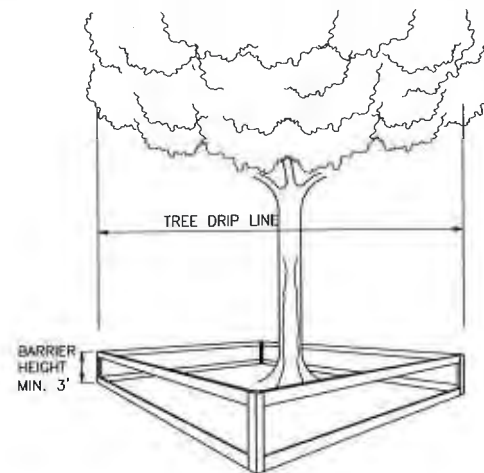
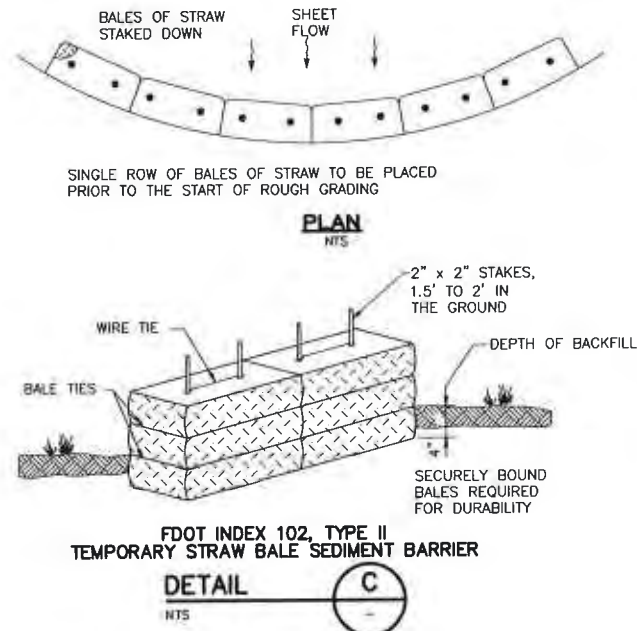


NOTES:

EROSION CONTROL

IT IS THE CONTRACTORS RESPONSIBILITY TO IMPLEMENT THE EROSION AND TURBIDITY CONTROLS AS SHOWN ON THE EROSION AND TURBIDITY CONTROL PLAN. IT IS ALSO THE CONTRACTORS RESPONSIBILITY TO ENSURE THESE CONTROLS ARE PROPERLY INSTALLED, MAINTAINED AND FUNCTIONING PROPERLY TO PREVENT TURBID OR POLLUTED WATER FROM LEAVING THE PROJECT SITE. THE CONTRACTOR WILL ADJUST THE EROSION AND TURBIDITY CONTROLS SHOWN ON THE EROSION AND TURBIDITY CONTROL PLAN AND ADD ADDITIONAL CONTROL MEASURES, AS REQUIRED, TO ENSURE THE SITE MEETS ALL FEDERAL, STATE AND LOCAL EROSION AND TURBIDITY CONTROL REQUIREMENTS. THE FOLLOWING BEST MANAGEMENT PRACTICES WILL BE IMPLEMENTED BY THE CONTRACTOR AS REQUIRED BY THE EROSION AND TURBIDITY CONTROL PLAN AND AS REQUIRED SITE BY THE REGULATORY AGENCIES.

1. SEDIMENT BASINS AND TRAPS, PERIMETER DITCHES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP BEFORE ANY LAND-DISTURBING TAKES PLACE.
2. ALL SEDIMENT CONTROL MEASURES ARE TO BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF CONSTRUCTION AND BE CONSTRUCTED PRIOR TO ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON BALANCE OF SITE. PERIMETER SEDIMENT BARRIERS SHALL BE CONSTRUCTED TO PREVENT SEDIMENT OR TRASH FROM FLOWING OR FLOATING ON TO ADJACENT PROPERTIES.
3. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCK PILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY PROTECTIONS AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.
4. AFTER ANY SIGNIFICANT RAINFALL SEDIMENT CONTROL STRUCTURES WILL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE REPAIRED IMMEDIATELY.
5. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.
6. WHENEVER WATER SEEPS FROM A SLOPE FACE ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.
7. SEDIMENT WILL BE PREVENTED FROM ENTERING ANY STORM DRAIN SYSTEM, DITCH, OR CHANNEL. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.
8. BEFORE TEMPORARY OR NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.
9. WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENRICHMENT. CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.
10. STOCKPILING MATERIAL: NO EXCAVATED MATERIAL SHALL BE STOCKPILED IN SUCH A MANNER AS TO DIRECT RUNOFF DIRECTLY OFF THE PROJECT SITE INTO ANY ADJACENT WATER BODY OR STORM WATER COLLECTION FACILITY.
11. EXPOSED AREA LIMITATION: THE SURFACE AREA OF OPEN, RAW ERODIBLE SOIL EXPOSED BY CLEARING AND GRUBBING OPERATIONS OR EXCAVATION AND FILLING OPERATIONS SHALL NOT EXCEED 5 ACRES. IF THE TOTAL AREA TO BE CLEARED IS EQUAL TO, OR EXCEEDS FIVE (5) ACRES, THEN THE CONTRACTOR WILL BE RESPONSIBLE FOR PREPARING A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH EPA'S NPDES REGULATIONS. THE CONTRACTOR WILL BE RESPONSIBLE FOR SUBMITTING A NOTICE ON INTENT (NOI) TO EPA FORTH-EIGHT (48) HOURS PRIOR TO COMMENCING CONSTRUCTION.



TREE PROTECTION BARRICADE SPECIFICATIONS:

1. CONTRACTOR TO COMPLY WITH ALL LOCAL TREE ORDINANCES IN ADDITION TO THE SPECIFICATIONS NOTED BELOW.
2. FOUR CORNER UPRIGHT STAKES OF NO LESS THAN 2" X 2" LUMBER CONNECTED BY HORIZONTAL MEMBERS OF NO LESS THAN 1" X 4" LUMBER; OR UPRIGHT STAKES SPACED AT 4-5' INTERVALS OF NO LESS 2" X 2" LUMBER CONNECTED BY TWINE FLAGGED WITH PLASTIC SURVEYING TAPE AT REGULAR INTERVALS.
3. REQUIRED BARRICADES AND FLAGGING SHALL BE ERECTED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO COMMENCEMENT OF LAND ALTERATION ACTIVITIES. BARRICADES SHALL REMAIN IN PLACE UNTIL ALTERATION AND CONSTRUCTION ACTIVITIES ARE COMPLETED.
4. DURING LAND ALTERATION AND CONSTRUCTION ACTIVITIES, IT SHALL BE UNLAWFUL TO REMOVE VEGETATION BY GRUBBING OR TO PLACE SOIL DEPOSITS, DEBRIS, SOLVENTS, CONSTRUCTION MATERIAL, MACHINERY OR OTHER EQUIPMENT OF ANY KIND WITHIN THE DRIPLINE OF A TREE TO REMAIN ON THE SITE UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. LAND ALTERATION ACTIVITIES SHALL NOT UNNECESSARILY REMOVE EXISTING VEGETATION AND ALTER EXISTING TOPOGRAPHY.

TREE PROTECTION BARRICADE

DETAIL D

NTS

REV.	NO.	DATE	DRWN	CHKD	REMARKS

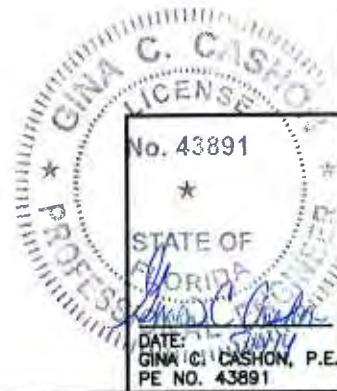
DESIGNED BY: K. LOBE
DRAWN BY: D. ANGE
SHEET CHKD BY: C. SCOTT
CROSS CHKD BY: K. LOBE
APPROVED BY: G. CASHON
DATE: MAY 2014

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TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

EROSION CONTROL DETAILS

PROJECT NO. 2790-83746
FILE NAME: CO03SDOT.DWG
SHEET NO.
CD-3



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NOTES:

1. FINISH GRADE VARIES ALONG SLOPE TO MATCH EXISTING.
2. SUMP PUMP TO DISCHARGE APPROXIMATELY 4' FEET BEYOND EXTERIOR WALL OF VALVE VAULT ONTO CONCRETE SPLASH PAD.
3. MOUNTING ORIENTATION OF PRESSURE TRANSMITTERS BY CONTRACTOR SHALL BE COORDINATED WITH TOWN. SEE E-SHEETS.
4. CONTRACTOR SHALL FIELD VERIFY ELEVATION OF EXISTING WATERMAIN AND SUBMIT TO THE OWNER PRIOR TO METER VAULT SUBMITTAL.

REV.	NO.	DATE	DRWN	CHKD	REMARKS

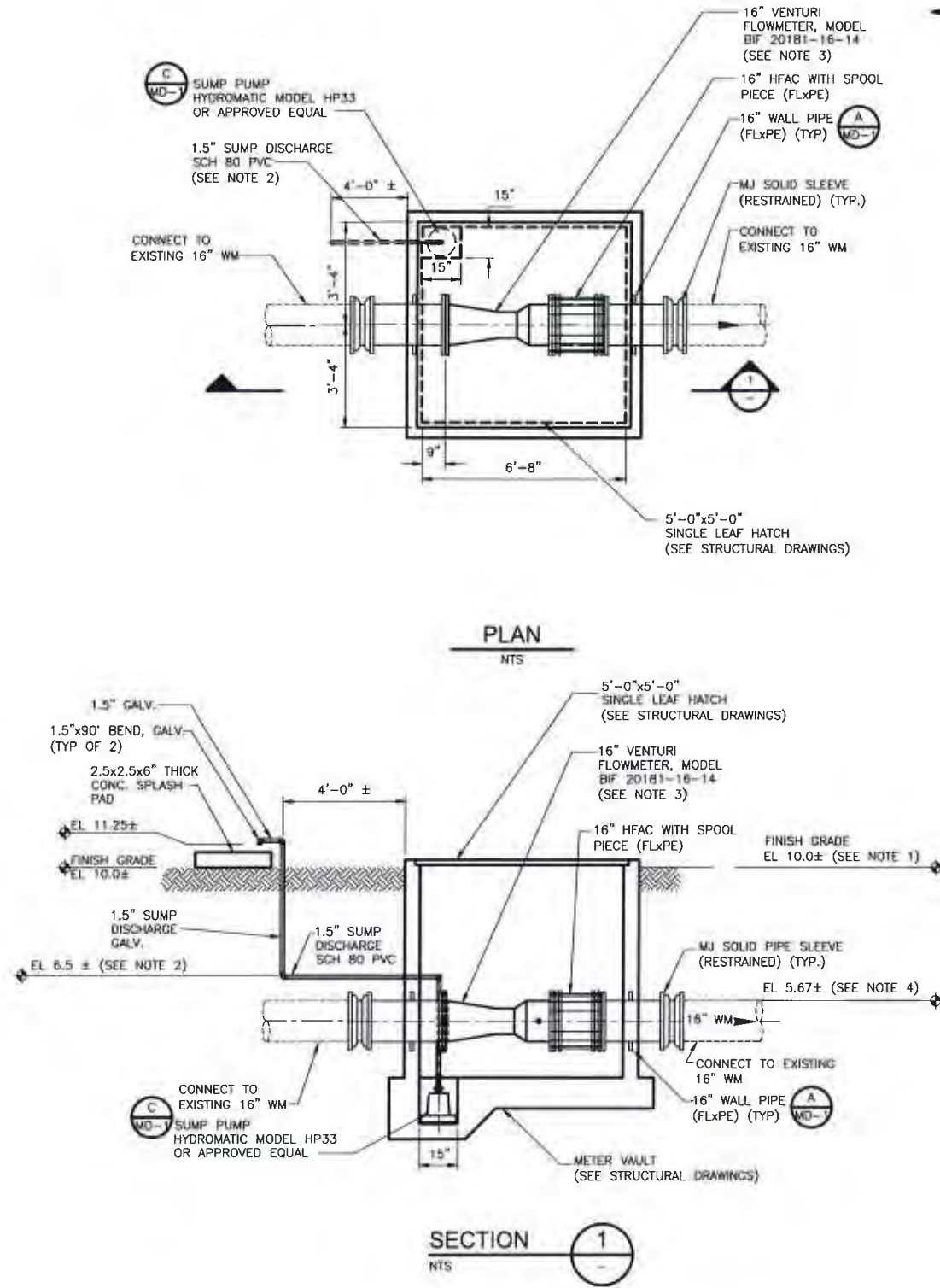
DESIGNED BY:	K. LOWE
DRAWN BY:	D. AUST
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DATE:	MAY 2014

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TOWN OF LONGBOAT KEY, FLORIDA
POTABLE WATER SYSTEM SUBAQUEOUS
CROSSING OF LONGBOAT PASS AND
SYSTEM PRESSURE CONTROLS

VENTURI METER
PLANS AND SECTIONS-
ADDITIVE ALTERNATE NO. 1

PROJECT NO.	2790-83746
FILE NAME:	M001DET.DWG
SHEET NO.	M-1



SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 LOCATION OF WORK

- A. The work of this Contract is located on the southern end of Anna Maria Island (starting at the Manatee County meter assembly located within Coquina Bayside Park), under the Longboat Pass and on the northern end of Longboat Key, Florida (east side of Gulf of Mexico Drive) as shown on the Drawings.

1.02 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, equipment, tools, services and incidentals required and complete all work required by these Specifications and as shown on the Drawings.
- B. The Work includes, but is not necessarily limited to, the following:
 - 1. Construct 6-inch through 16-inch potable water transmission mains constructed by open-trench method and approximately 2,300 feet of 16-inch subaqueous crossing constructed by horizontal directional drilling method.
 - 2. Construct new water service lines, fire hydrant, and reconnect existing services.
 - 3. Construct associated electrical and instrumentation components for existing pressure reducing valve.
 - 4. Perform all associated miscellaneous work, restoration and cleanup.
 - 5. Additive Alternate No 1 - Construct venturi meter vault with associated electrical and instrumentation components.

1.03 WORK BY OTHERS

- A. The following work will be performed by others.
 - 1. Visual buffer related landscaping work shall be done by others.
- B. Refer to General Conditions for additional requirements.

1.04 WORK SEQUENCE

- A. Completion dates of the various stages shall be in accordance with the approved construction schedule submitted by the CONTRACTOR.
- B. The 16" x 6" tapping valve and sleeve, construction of the new 6-inch water main, construction and tie-in of all water services extending from the 6-inch water shall be completed prior to installation of the 16-inch line stop.

1.05 CONSTRUCTION AREAS

- A. CONTRACTOR shall not use the construction work areas for storage. Material storage is the responsibility of the Contractor.
- B. Coordinate use of work site under direction of ENGINEER.

- C. The area designated as "Temporary Pipe Layout Area" shall be used exclusively for the stringing of pipe as required for the horizontal directional drill. No other construction activities shall be permitted in this area without the written authorization of the OWNER.
- D. Assume full responsibility for the protection and safekeeping of Products under this Contract, stored at the designated area.
- F. Obtain and pay for the use of additional storage or work areas needed for operations.

1.06 OWNER OCCUPANCY

- A. OWNER will occupy premises during performance of the work for the conduct of his/her normal operations. Coordinate all construction operations with OWNER to minimize conflict and to facilitate OWNER usage.
- B. CONTRACTOR shall at all times conduct his operations as to insure the least inconvenience to the general public.

1.07 PRE-CONSTRUCTION CONFERENCE

- A. Within ten (10) days of the Notice to Proceed, a joint meeting shall be held with representatives of the CONTRACTOR and major subcontractors, the ENGINEER, the OWNER, and other invited parties or government agencies which may be affected by or have jurisdiction over the Project.
- B. This meeting is intended to introduce the various key personnel from each organization and discuss the Contract Documents, the start of construction, order of work, labor and legal requirements, insurance requirements, names of major subcontractors, method of payment, shop drawing requirements, protection of existing facilities and other pertinent items associated with the Project.
- C. Within fifteen (15) days of the Notice to Proceed, the CONTRACTOR shall provide six (6) copies of a proposed work schedule.

1.08 OWNER-FURNISHED PRODUCTS

- A. Refer to Specification Section 01500 for temporary water service for construction use.
- B. OWNER will furnish meter boxes as indicated on the drawings.

1.09 DISCREPANCY BETWEEN DRAWINGS AND SPECIFICATIONS

- A. In case of any discrepancy between the Drawings and Specifications, the more stringent requirement shall apply. The CONTRACTOR will not be held responsible for the discovery of such discrepancy, but any work done on the item involved after such discovery, and prior to authorization by the ENGINEER, will be done at the CONTRACTOR'S risk and expense.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01014

CONSTRUCTION CONSTRAINTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Areas of construction under this contract must be coordinated with Florida Department of Transportation, Manatee County and private property owner's to maintain access to their facilities and to allow construction to be completed.
- B. The HDD Entry Pit and pipe layout area are both located on the north side of Longboat Pass. The CONTRACTOR shall plan construction activities and equipment layout to accommodate the staging areas as shown on the plans. The OWNER has negotiated agreements with Manatee County for a temporary pipe layout area and HDD staging area in the Coquina Bayside Park adjacent to the FDOT right of way for the HDD pullback operation. The temporary pipe layout area measures approximately 30 feet wide by 1,300 feet long. CONTRACTOR's use of temporary staging area shall be limited to the period of four consecutive months, including restoration to pre-construction grades. CONTRACTOR's use of temporary pipe layout area shall be limited to a period not to exceed 21 consecutive calendar days which shall occur within the time period authorized for the use of the HDD staging area noted above.
- C. The CONTRACTOR's nighttime construction activities may be restricted during turtle nesting season (May 1 –October 31). See Section 01065 for additional requirements. The CONTRACTOR shall be responsible for satisfying all permit requirements.
- D. The WORK will require tie-ins to the existing water distribution system to the north and south of the new water main. Under normal conditions, the water supply to the TOWN is supplied by Manatee County via the existing 16" water main attached to the Longboat Pass Bridge and supplemented via the TOWN's storage and pumping systems as needed. For the purpose of pipeline tie-ins, the water supply from Manatee County may be temporarily interrupted as described herein. The CONTRACTOR shall provide the OWNER with a written notification 2 weeks in advance of any proposed shut down of water service and must receive written approval from the OWNER prior to the planned shutdown. Shut downs will NOT be permitted to start on a Friday, Saturday or Sunday. The OWNER or Manatee County shall open/close all existing water main valves and all new valves on existing water mains on their respective water distribution systems. There is no guarantee that water main isolation valves will not leak. The CONTRACTOR shall be prepared to collect and dechlorinate leakage as needed. The CONTRACTOR shall satisfy the requirements of all applicable regulations and coordinate with the OWNER on any boil water notices to the residents, if needed. The CONTRACTOR shall submit a construction sequence, disinfection and tie-in plan for approval by the ENGINEER within 15 days of NOTICE TO PROCEED. The CONTRACTOR will be limited to the following periods of service disruption:
 - a. Installation of the 16-inch line stop shall be coordinated to occur concurrently with a water service disruption limited to 6 hours. During this 6-hour period, cut-in of 16-inch water main near HDD exit pit and venturi meter installation shall be coordinated to occur concurrently. Prior to the tie-in of new water main to the existing water main, all portions of pipe in excess of 18 feet shall have passed all required pressure and bacteriological testing and received clearance to be placed into service by the Florida Department of Environmental Protection.
 - b. Tie-in to Manatee County meter assembly on the north end and cut-in to existing 16" water main near HDD entry pit shall be coordinated to occur concurrently and will be limited to one 6-hour shut down. Prior to the tie-in of new water main to the existing water main, all

portions of pipe in excess of 18 feet shall have passed all required pressure and bacteriological testing and received clearance to be placed into service by the Florida Department of Environmental Protection.

- c. If the CONTRACTOR anticipates needing additional time for the service disruption (in excess of the allowable 6 hours), the CONTRACTOR shall provide the OWNER with a written notification 2 weeks in advance of the proposed shut down of water service. The notification shall indicate the total requested time for service disruption. The CONTRACTOR must receive written approval from the OWNER prior to the planned shutdown.
- E. If CONTRACTOR is required to coordinate his/her activities in the interface or common areas with other contractors and the utilities, CONTRACTOR must submit to the ENGINEER a description and schedule as to how the common areas will be utilized, recognizing the required coordination with other contractors and the facility operators.
- F. During Start-Up Testing, CONTRACTOR shall make available the manpower, equipment and manufacturer's representatives required to make any necessary testing, adjustments and training of OWNER'S personnel.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Provide all cutting, fitting and patching, including attendant excavation and backfill, required to complete the work or to:
 - 1. Make its several parts fit together properly.
 - 2. Uncover portions of the work to provide for installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to requirements of Contract Documents.
 - 5. Remove samples of installed work as specified for testing.
 - 6. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

1.02 RELATED WORK

- A. Summary of Work is included in Section 01010.
- B. Sitework is included in Division 2.
- C. Asphalt Cutting and Repair is included in Division 2.

1.03 SUBMITTALS

- A. Submit to the ENGINEER, in accordance with Section 01300, a written request well in advance of executing any cutting or alteration which affects:
 - 1. Work of the OWNER or any separate CONTRACTOR.
 - 2. Structural value or integrity of any element of the project.
 - 3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
 - 4. Efficiency, operational life, maintenance or safety of operational elements.
 - 5. Visual qualities of sight-exposed elements.
- B. Request shall include:
 - 1. Identification of the project.
 - 2. Description of affected work.
 - 3. The necessity for cutting, alteration or excavation.
 - 4. Effect on work of OWNER or any separate CONTRACTOR, or on structural or weatherproof integrity of project.
 - 5. Description of proposed work:
 - a. Scope of cutting, patching, alteration, or excavation.
 - b. Trades who will execute the work.
 - c. Products proposed to be used.
 - d. Extent of refinishing to be done.
 - 6. Alternatives to cutting and patching.
 - 7. Cost proposal, when applicable.
 - 8. Written permission of any separate CONTRACTOR whose work will be affected.

- C. Submit written notice to the ENGINEER designating the date and the time the work will be uncovered.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Comply with specifications and standards for each specific product involved.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Inspect existing conditions of project, including elements subject to damage or to movement during cutting and patching.
- B. After uncovering work, inspect conditions affecting installation of products, or performance of work.
- C. Report unsatisfactory or questionable conditions to the ENGINEER in writing; do not proceed with work until the ENGINEER has provided further instructions.

3.02 PREPARATION

- A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.
- B. Provide devices and methods to protect other portions of project from damage.
- C. Provide protection from elements for that portion of the project which may be exposed by cutting and patching work, and maintain excavations free from water.

3.03 PERFORMANCE

- A. Execute cutting and demolition by methods which will prevent damage to other work and will provide proper surfaces to receive installation of repairs.
- B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.
- C. Employ original installer or fabricator to perform cutting and patching for:
 - 1. Weather-exposed or moisture-resistant elements.
 - 2. Sight-exposed finished surfaces.
- D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- E. Restore work which has been cut or removed; install new products to provide completed work in accordance with requirements of Contract Documents.
- F. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

- G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
1. For continuous surfaces, refinish to nearest intersection.
 2. For an assembly, refinish entire unit.

END OF SECTION

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SECTION 01050

FIELD ENGINEERING

PART 1- GENERAL

1.01 SCOPE OF WORK

- A. Provide and pay for field engineering services required for project.
 - 1. Survey work required in execution of project.
 - 2. Civil, structural or other professional engineering services specified, or required to execute CONTRACTOR's construction methods.
- B. Retain the services of a professional land surveyor and mapper licensed in the State of Florida:
 - 1. Identify existing control points and property line corner stakes indicated on the Drawings, as required.
 - 2. Verify all existing above ground utility and equipment locations.
 - 3. Maintain an accurate location of all buried piping 4-in in diameter and larger.
 - 4. Maintain all survey control for line and grade.

1.02 RELATED WORK

- A. Summary of Work is included in Section 01010
- B. Applications for Payment are included in Section 01152.
- C. Project Record Documents are included in Section 01720.

1.03 SUBMITTALS

- A. Submit to the ENGINEER, in accordance with Section 01300, name and address of professional land surveyor and mapper or professional engineer.
- B. On request of the ENGINEER, submit documentation to verify accuracy of field engineering work. As a minimum the ENGINEER will review the as-builts on a monthly basis.
- C. Submit certificate signed by professional engineer or surveyor and mapper certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.
- D. At Contract Substantial Completion, submit five (5) sets of certified drawings with the Surveyors title block (signed and sealed by the professional surveyor and mapper) of the items listed below. All surveys shall be tied to State Plane Coordinate System. Vertical control shall be based on NAVD 1988. These drawings shall be included with, and made a part of, the project record documents.
 - 1. Certified structure and pipeline survey indicating the structure corners and elevations, and pipeline locations and crown elevations at 100-foot intervals and at all changes in alignment.
 - 2. Certified survey shall be at the same scale as the ENGINEER's drawings (C Sheets).
 - 3. CONTRACTOR shall also submit record drawing files in AutoCAD (latest version) format on CDs. All entries shall be placed on layers named to describe the entity being mapped. All

elevation information in the AutoCAD file shall be in an appropriate three dimensional format.

1.04 QUALIFICATIONS OF SURVEYOR OR ENGINEER

- A. Registered professional engineer or surveyor and mapper of the discipline required for the specific service on the project, currently licensed in the State of Florida.

1.05 SURVEY REFERENCE POINTS

- A. Existing basic horizontal and vertical control points for the project are those designated on Drawings.
- B. Locate and protect control points prior to starting site work and preserve all permanent reference points during construction.
 - 1. Make no changes or relocations without prior written notice to the ENGINEER.
 - 2. Report to the ENGINEER when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - 3. Require surveyor to correctly replace project control points which may be lost or destroyed.
 - a. Establish replacements based on original survey control.
 - b. Reset control points relocated due to project routing.

1.06 PROJECT SURVEY REQUIREMENTS

- A. Establish a minimum of two permanent bench marks on site, referenced to data established by survey control points.
 - 1. Record locations, with horizontal and vertical data, on Project Record Documents.
- B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:
 - 1. Site improvements
 - a. Stakes for grading, fill and topsoil placement.
 - b. Utility slopes and invert elevations.
 - 2. Batter boards for structures.
 - 3. Building foundation, column locations and floor levels.
 - 4. Controlling lines and levels required for mechanical and electrical trades.
- C. Verify layouts by same methods monthly and submit to the ENGINEER.

1.07 RECORDS

- A. Maintain a complete, accurate log of all control and survey work as it progresses.
- B. Update the project record drawings on a monthly basis based on the work performed during the month ending at the pay request as a condition for approval of monthly progress payment requests.
- C. Maintain an accurate record of all changes, revisions, and modifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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CONFORMED

SECTION 01065

PERMITS AND FEES

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The CONTRACTOR shall obtain and pay for any and all permits and licenses required to complete the project except for those permits obtained by OWNER as listed below or as specified otherwise.
- 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.

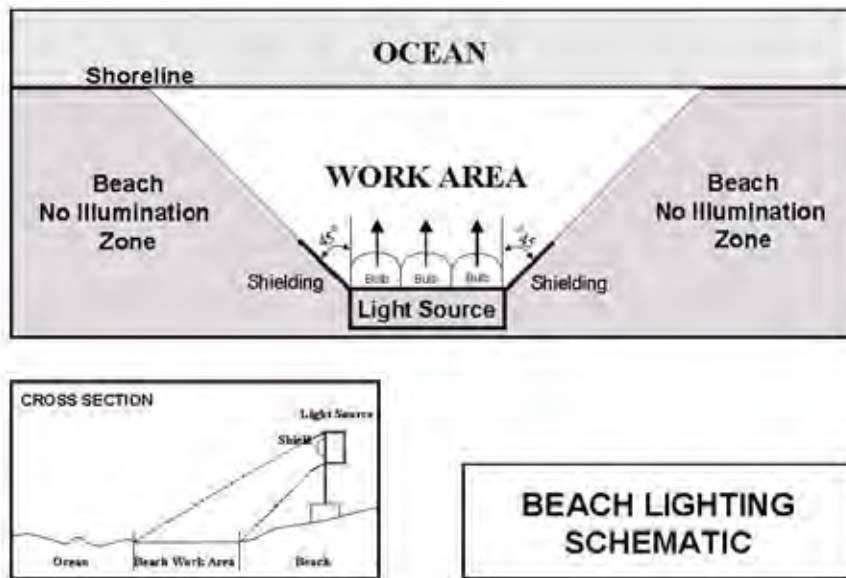
1.02 PERMITS BY OWNER

- A. The OWNER has obtained or will obtain the permits listed below, see Section 01002 for a copy of the permits:
 - 1. The Florida Department of Environmental Protection (FDEP) Environmental Resource Permit (ERP)
 - 2. U.S. Army Corps of Engineers (ACOE) Construction Permit
 - 3. FDEP Authorization to Use Sovereign Submerged Lands
 - 4. FDEP Specific Permit to Construct a Potable Water System (PWS) Permit
 - 5. FDEP Coastal Construction Control Line Permit
 - 6. FDOT ROW Utilization Permit

1.03 PERMIT REQUIREMENTS

- A. CONTRACTOR shall be responsible for preparation of a Stormwater Pollution Prevention Plan and shall obtain an FDEP permit for stormwater discharge from construction activities.
- B. The CONTRACTOR shall be responsible for development of an eastern indigo snake protection/education plan as required by the ACOE. The plan shall be provided to the ACOE for review and approval at least 30 days prior to any clearing activities.
- C. The CONTRACTOR shall comply with all permit requirements/guidelines for protection of marine turtles during nesting activities. During construction, temporary security lighting during the main portion of the marine turtle nesting season (May 1 - October 31) is strongly discouraged.
- D. The CONTRACTOR shall be responsible for compliance with all permit requirements/guidelines for protection of marine turtles during turtle nesting season (May 1 - October 31). If any turtle interaction is required, the designated FWC Turtle Permit Holder for Manatee County, Ms. Susie Fox, shall be contacted.
- E. All nighttime lighting of offshore or onshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the water's surface and nesting beach while meeting all Coast Guard, EM 385-1-1, and OSHA requirements.

Light intensity shall be reduced to the minimum standard required by OSHA for General Construction areas, in order not to misdirect sea turtles. Shields shall be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the



construction area.

- F. If dewatering discharges to waters of the State are proposed, the CONTRACTOR may be required to obtain an FDEP Generic Permit for the Discharge of Produced Groundwater from any Non-Contaminated Site Activity.
- G. CONTRACTOR shall be responsible for providing a Maintenance of Traffic (MOT) Plan which compiles to FDOT standards.
- H. CONTRACTOR shall be responsible for obtaining a Building Department permit from the Town of Longboat Key. The Town will pay for all permit fees for building permits.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01095

REFERENCES

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. REFERENCE ABBREVIATIONS
- B. ABBREVIATIONS
- C. REFERENCE STANDARDS
- D. DEFINITIONS

1.02 RELATED SECTIONS

- A. Information provided in this section is used where applicable in individual Specification Sections, Divisions 2 through 16.

1.03 REFERENCE ABBREVIATIONS

- A. Reference to a technical society, trade association or standards setting organization, may be made in the Specifications by abbreviations in accordance with the following list:

AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ACI	American Concrete Institute
ADC	Air Diffusion Council
AFBMA	Anti-friction Bearing Manufacturers Association
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AHA	Association of Home Appliance Manufacturers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association, Inc.
ANSI	American National Standards Institute
APA	American Plywood Association
ARI	American Refrigeration Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders' Hardware Manufacturers Association

BIA	Brick Institute of American
CABO	Council of American Building Officials
CAGI	Compressed Air and Gas Institute
CISPI	Cast Iron Soil Pipe Institute
CMAA	Crane Manufacturers Association of America
CRD	U.S. Corps of Engineers Specifications
CRSI	Concrete Reinforcing Steel Institute
CTI	Cooling Tower Institute
DHI	Door and Hardware Institute
DOH	Department of Health
DOT	Department of Transportation
Fed. Spec.	Federal Specifications
FGMA	Flat Glass Marketing Association
FM	Factory Mutual
HMI	Hoist Manufacturing Institute
HPMA	See HPVA
HPVA	Hardwood Plywood Veneer Association
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronics Engineers
IFI	Industrial Fasteners Institute
MIL	Military Specifications
MSS	Manufacturer's Standardization Society
NAAMM	National Association of Architectural Metal Manufacturers
NACM	National Association of Chain Manufacturers
NBS	National Bureau of Standards, See NIST
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NETA	National Electrical Testing Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NFPA	National Fluid Power Association
NIST	National Institute of Standards and Technology
NLMA	National Lumber Manufacturers Association
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Act
PCI	Prestressed Concrete Institute
PDI	Plumbing and Drainage Institute
SAE	Society of Automotive Engineers
SCPRF	Structural Clay Products Research Foundation
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SPI	Society of the Plastics Industry
SSPC	Steel Structures Painting Council
STI	Steel Tank Institute
TCA	Tile Council of American
TIMA	Thermal Insulation Manufacturers' Association
UL	Underwriters' Laboratories, Inc.
USBR	U. S. Bureau of Reclamation
USBS	U. S. Bureau of Standards, See NIST

1.04 ABBREVIATIONS

- A. Abbreviations which may be used in individual Specification Sections Divisions 1 through 16 are as follows:

alternating current ac
American wire gauge AWG
ampere(s)..... amp
ampere-hour(s)..... AH
annual ann
Ampere Interrupting
Capacity AIC
atmosphere(s)..... atm
average avg

biochemical oxygen demand.....BOD
Board Foot FBM
brake horsepower bhp
Brinell Hardness..... BH
British thermal unit(s)..... Btu

calorie (s) cal
carbonaceous biochemical
oxygen demand CBOD
Celsius (centigrade) C
Center to Center C to C
centimeter(s) cm
chemical oxygen demand.....COD
coefficient, valve flow C_v
condensate return CR
cubic cu
cubic centimeter(s)..... cc
cubic feet per day cfd
cubic feet per hour cfh
cubic feet per minute..... cfm
cubic feet per minute,
standard conditions scfm
cubic feet per second..... cfs
cubic foot (feet).....cu ft
cubic inch(es)..... cu in
cubic yard(s)..... cu yd

decibels dB
decibels (A scale).....dBa
degree(s)..... deg
dewpoint temperature..... dpt
diameter dia
direct current dc
dissolved oxygen..... DO
dissolved solids DS
dry-bulb temperature..... dbt

efficiency eff
elevation..... el
engineer of record.....EOR
entering water temperature ewt
entering air temperature.....eat
equivalent direct radiation edr

face area..... fa
face to face.....f to f
Fahrenheit F
feet per day fpd
feet per hour..... fph
feet per minute fpm
feet per second fps
foot (feet) ft
foot-candle fc
foot-pound ft-lb
foot-pounds per minute..... ft-lb/min
foot-pounds per second..... ft-lb/sec
formazin turbidity unit(s).....FTU
frequency freq
fuel oil..... FO
fuel oil supply FOS
fuel oil return FOR

gallon(s)..... gal
gallons per day..... gpd
gallons per day per
cubic foot..... gpd/cu ft
gallons per day per
square foot gpd/sq ft
gallons per hour gph
gallons per minute gpm
gallons per second gps
gas chromatography and
mass spectrometry GC-MS
gauge..... ga
grain(s)..... gr
gram(s)..... g
grams per cubic centimeter.....gm/cc
Heat Transfer Coefficient U
height hgt
Hertz Hz
horsepower..... hp
horsepower-hour.....hp-hr

hour(s)..... hr
 humidity, relative rh
 hydrogen ion concentration..... pH

 inch(es)..... in
 inches per second ips
 inside diameter ID

 Jackson turbidity unit(s)..... JTU

 kelvin K
 kiloamperes kA
 kilogram(s)..... kg
 kilometer(s)..... km
 kilovar (kilovolt-amperes
 reactive)..... kvar
 kilovolt(s)..... kV
 kilovolt-ampere(s)..... kVA
 kilowatt(s) kW
 kilowatt-hour(s)..... kWh

 linear foot (feet) lin ft
 liter(s)..... L

 megavolt-ampere(s) MVA
 meter(s) m
 micrograms per liter..... ug/L
 miles per hour mph
 milliamperes(s)..... mA
 milligram(s)..... mg
 milligrams per liter..... mg/L
 milliliter(s) mL
 millimeter(s)..... mm
 million gallons MG
 million gallons per day..... mgd
 millisecond(s)..... ms
 millivolt(s) mV
 minute(s) min
 mixed liquor suspended
 solids MLSS
 nephelometric turbidity
 unit NTU
 net positive suction head..... NPSH
 noise criteria..... nc
 noise reduction coefficient..... NRC
 number no

 ounce(s)..... oz
 outside air..... oa
 outside diameter OD

 parts per billion ppb

parts per million..... ppm
 percent pct
 phase (electrical)..... ph
 pound(s)..... lb
 pounds per cubic foot pcf
 pounds per cubic foot
 per hour..... pcf/hr
 pounds per day..... lbs/day
 pounds per day per
 cubic foot..... lbs/day/cu ft
 pounds per day per
 square foot lbs/day/sq ft
 pounds per square foot..... psf
 pounds per square foot
 per hour..... psf/hr
 pounds per square inch psi

 pounds per square inch
 absolute psia
 pounds per square inch
 gauge..... psig
 power factor PF
 pressure drop or
 difference..... dp
 pressure, dynamic
 (velocity)..... vp
 pressure, vapor..... vap pr

 quart(s)..... qt

 Rankine R
 relative humidity..... rh
 resistance res
 return air ra
 revolution(s)..... rev
 revolutions per minute rpm
 revolutions per second rps
 Right of Way..... ROW
 root mean squared..... rms

 safety factor sf
 second(s)..... sec
 shading coefficient..... SC
 sludge density index SDI

 Sound Transmission
 Coefficient STC
 specific gravity sp gr
 specific volume..... Sp Vol
 sp ht at constant pressure Cp
 square..... sq
 square centimeter(s)..... sq cm

square foot (feet)..... sq ft
 square inch (es) sq in
 square meter(s)..... sq m
 square yard(s)..... sq yd
 standard..... std
 static pressure..... st pr
 supply air..... . . sa
 suspended solids..... SS

 temperature temp
 temperature difference TD
 temperature entering TE
 temperature leaving..... TL
 thousand Btu per hour..... Mbh
 thousand circular mils..... kcmil
 thousand cubic feet Mcf
 threshold limit value TLV
 tons of refrigeration..... tons
 torque TRQ
 total dissolved solids..... TDS
 total dynamic head TDH
 total kjeldahl nitrogen TKN
 total oxygen demand..... TOD
 total pressure TP

total solids..... TS
 total suspended solids TSS
 total volatile solids..... TVS
 vacuum..... vac
 viscosity..... visc
 volatile organic chemical..... VOC
 volatile solids..... VS
 volatile suspended solids VSS
 volt(s)..... V
 volts-ampere(s)..... VA
 volume vol
 watt(s) W
 watthour(s)..... Wh
 watt-hour demand WHD
 watt-hour demand meter WHDM
 week(s)..... wk
 weight wt
 wet-bulb..... WB
 wet bulb temperature WBT

 yard(s)..... yd
 year(s)..... yr

1.05 REFERENCE PUBLICATIONS

The following publications are incorporated into this manual and are made a part of this Manual as is set out verbatim in this Manual. Violations of any provision of every such publication, latest revision, shall be a violation of City Ordinance.

- A. Water Environment Federation, Manual of Practice No. 8, Wastewater Treatment Plant Design, W.E.F., 601 Wythe Street, Alexandria, VA, 22314-1994.
- B. Water Environment Federation, Manual of Practice No. 9, Design and Construction of Sanitary and Storm Sewers, W.E.F., 601 Wythe Street, Alexandria, VA, 22314-1994.
- C. Great Lakes/Upper Mississippi River Board of State Sanitary Engineers. Recommended Standards for Sewage Works, Health Education Service, Inc., P.O. Box 7283, Albany, New York, 12224.
- D. Great Lakes/Upper Mississippi River Board of State Sanitary Engineers. Recommended Standards for Water Works, Health Education Service, Inc., P.O. Box 7283, Albany, New York, 12224.
- E. Florida Department of Environmental Protection for Water, Wastewater, and Reclaimed Water Systems, latest revisions of F.A.C. Chapters 62-550, 62-555, 62-600, 62-604, 62-610, 64E-6, and 64E-8, 3900 Commonwealth Boulevard M.S. 49, Tallahassee, Florida, 32399.
- F. American Water Works Association, Inc., Water Treatment Plant Design, 6666 West Quincy Avenue, Denver, Colorado, 80235.

- G. American Water Works Association, Inc., Water Treatment Plant Design, AWWA Standards and Applicable Manuals, 6666 West Quincy Avenue, Denver, Colorado, 80235.
- H. Ductile Iron Pipe Research Association, Handbook, Ductile Iron Pipe/Cast Iron Pipe, Ductile Iron Pipe Research Association, 245 Riverchase Parkway East, Birmingham, Alabama, 35244.
- I. Uni-Bell Plastic Pipe Association, Handbook of PVC Pipe, Uni-Bell Plastic Pipe Association, 2655 Villa Creek Drive, Suite 164, Dallas, Texas, 75234.
- J. American National Standards Institute, latest revisions of applicable standards, 1819 L Street NW, Suite 600, Washington, D.C., 20036.
- K. American Society for Testing and Materials, latest revisions of applicable standards, ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, 19428-2959.
- L. National Water Research Institute, Treatment Technologies for Removal of MTBE. NWRI, 10500 Ellis Ave., P.O. Box 20865, Fountain Valley, CA, 92728.
- M. National Water Research Institute, Valuing Ground Water: Economic Concepts/Approaches. NWRI, 10500 Ellis Ave., P.O. Box 20865, Fountain Valley, CA, 92728.7.3.14.
- N. U.S. Environmental Protection Agency, Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability, Supplement to the Federal Guidelines for Design, Operation, and Maintenance of Wastewater Treatment Facilities, Technical Bulletin EPA-430-99-74-001, U.S. EPA, Office of Water Program Operations.
- O. Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, Maps & Publications Sales, Mail Station 12, 605 Suwannee Street, Tallahassee, Florida 32399-0450.
- P. Plastics Pipe Institute, Handbook of Polyethylene Pipe, 1825 Connecticut Ave., NW, Suite 680, Washington, DC 20009.
- Q. National Fire Protection Association, 1995 Edition of NFPA 24 – Standard for the Installation of Private Fire Service Mains and Their Appurtenances, 1 Batterymarch Park, Quincy, MA 02169.
- R. National Electrical Code, latest revisions of applicable requirements.
- S. Metcalf and Eddy, Wastewater Engineering Treatment and Reuse, 4th Edition, McGraw-Hill, 2002.
- T. Water Environment Federation, Manual of Practice No. 11, Operation of Municipal Wastewater Treatment Plants, 601 Wythe Street, Alexandria, VA 22314-1994.
- U. American Petroleum Institute, 1801 K Street NW, Washington, DC 20006.
- V. American Welding Society, 2501 NW 7th St, Miami, FL 33125.
- W. Factory Mutual Research, 1151 Boston-Providence Turnpike, Norwood, MA 02062
- X. National Association of Corrosion Engineers, P.O. Box 218340, Houston, TX 77218.

- Y. National Electrical Manufacturer's Association, 155 East 44th St., NY, NY 10017.
- Z. Occupational Safety and Health Act, U.S. Dept. of Labor, Occupational Safety and Health Administration, 299E. Broward Blvd. – Rm 302, Ft. Lauderdale, FL 33301.
- AA. Society of Automotive Engineers, 2 Pennsylvania Plaza, NY, NY 10001.
- BB. Steel Structures Painting Council, 4400 Fifth Ave., Pittsburgh, PA 15213.
- CC. Standard Specification for Public Works, Construction Building News, Inc., 3055 Overland Ave., Los Angeles, CA 90034.
- DD. Uniform Building Code, published by ICBO.
- EE. Underwriters Laboratories, Inc., 207 East Ohio Street, Chicago, IL 60611.

1.06 REFERENCE STANDARDS

- A. Latest Edition: Construe references to furnishing materials or testing, which conform to the standards of a particular technical society, organization, or body, to mean the latest standard, code, or specification of that body, adopted and published as of the date of bidding this Contract. Standards referred to herein are made a part of these Specifications to the extent that is indicated or intended.
- B. Precedence: The duties and responsibilities of the CITY, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees are set forth in the Contract Documents, and are not changed or altered by any provision of any referenced standard specifications, manuals or code, whether such standard manual or code is or is not specifically incorporated by reference in the Contract Documents. Any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority, to undertake responsibility contrary to the powers of the ENGINEER as set forth in the Contract Documents cannot be assigned to the ENGINEER or any of the ENGINEER's consultants, agents or employees.

1.07 DEFINITIONS

- A. In these Contract Documents the words furnish, install, and provide are defined as follows:
 - 1. Furnish (Materials): to supply and deliver to the project ready for installation and in operable condition.
 - 2. Install (services or labor): to place in final position, complete, anchored, connected in operable condition.
 - 3. Provide: to furnish and install complete. Includes the supply of specified services. When neither furnish, install, or provide is stated, provided is implied.
 - 4. TOWN or Town: Town of Longboat Key, Florida, or authorized staff or representatives.
 - 5. ENGINEER: The terms Design Professional, Design Engineer, Engineer, and Engineer of Record are interchangeably used throughout the Contract Documents.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01100

SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.01 WORKMANSHIP, MATERIAL AND EQUIPMENT

- A. When a particular product is specified or called for, it is intended and will 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 will furnish information as described in the General Conditions and Section 01300. The alternate product or products submitted by the CONTRACTOR will meet the requirements of the specifications and will, in all respects, be equal to the products specified by name herein. All alternate equipment must be approved by the ENGINEER.
- B. All apparatus, mechanism, equipment, machinery and manufactured articles for incorporation into the Work will be the new and unused standard products of recognized reputable manufacturers.
- C. CONTRACTOR must provide for disposal of excess excavated material.

1.02 CONNECTIONS TO EXISTING SYSTEMS

- A. The CONTRACTOR will perform all work necessary to locate, excavate and prepare for connections to the terminus of the existing systems all as shown on the Drawings. The cost for this work and for the actual connection to the existing systems will be included in the bid price for the project and will not result in any additional cost to the OWNER.

1.03 OPERATING AND MAINTENANCE DATA

- A. Operating and maintenance data covering all equipment furnished will be delivered directly to the ENGINEER for approval within 60 days of shop drawing approval of each piece of equipment. No payment will be made for equipment installed or stored on-site until the ENGINEER has approved the adequacy and completeness of the operating and maintenance data. Data will be prepared and submitted in full conformance with Section 01730. Final approved copies of operating and maintenance data will have been delivered to the ENGINEER on OWNER's behalf two weeks prior to scheduling the instruction period with the OWNER.

1.04 RESPONSIBILITY OF CONTRACTOR

- A. The CONTRACTOR will 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 will 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 will keep the Contract under his own control and it will be his responsibility to see that the Work is properly supervised and carried on faithfully and efficiently. The CONTRACTOR will supervise the work personally or will have a competent, English speaking superintendent or representative, who will be on the site of the project at all working hours, and who will 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, will be done anew in accordance with the Contract and Specifications at the expense of the CONTRACTOR.

1.05 PROVISIONS FOR CONTROL OF EROSION

- A. Sufficient precautions will 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 will be taken in the use of construction equipment to prevent operations which promote erosion.

Erosion evident within the limits of construction will 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 will be fully restored to original or design conditions (as applicable) within 10 days of notice to the CONTRACTOR.

1.06 ON SITE STORAGE

- A. The CONTRACTOR's attention is invited to special storage requirements and possible charges for noncompliance of on site storage requirements for materials and equipment as specified in Section 01600.

1.07 WARRANTIES

- A. Unless specified otherwise in the Contract Documents, all equipment supplied under these Specifications will be warranted by the CONTRACTOR and the equipment manufacturers for a period of one (1) year. Warranty period will commence on the date of Final Acceptance by the OWNER.
- B. The equipment will be warranted to be free from defects in workmanship, design and materials. If any part of the equipment should fail during the warranty period, it will be replaced at no expense to the OWNER.
- C. The manufacturer's warranty period will run concurrently with the CONTRACTOR'S warranty or guarantee period. No exception to this provision will be allowed. The CONTRACTOR will be responsible for obtaining equipment warranties in accordance with Section 01740 from each of the respective supplier or manufacturers for all the equipment specified. The form of warranty is included in the front-end documents.

1.08 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 will 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.

1.09 CONSTRUCTION CONDITIONS AND SUBSURFACE INVESTIGATION

- A. The CONTRACTOR will 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 will apply.
- B. The CONTRACTOR will 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.

1.10 PUBLIC NUISANCE

- A. The CONTRACTOR will not create a public nuisance including but not limited to encroachment on adjacent lands, flooding of adjacent lands, excessive noise, or odor.
- B. The CONTRACTOR shall maintain the sound levels in accordance with the conditions listed here and in Section 01001.
- C. Sound levels measured by the OWNER will not exceed 55 dBA from 8:00 PM to 8:00 AM or 65 dBA from 8:00 AM to 8:00 PM. This sound level to be measured at the Owner's property line. Levels at the equipment will 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 due to excessive noise will not relieve the CONTRACTOR of the other portions of this specification including, but not limited to contract time and contract price.
- D. No extra charge may be made for time lost due to work stoppage resulting from the creation of a public nuisance.

1.11 SUSPENSION OF WORK DUE TO WEATHER

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

1.12 RELOCATIONS

- A. The CONTRACTOR will be responsible for the relocation of structures, including but not limited to light poles, signs, sign poles, fences, piping, conduits and drains that interfere with the positioning of the work as set out on the Drawings. The cost of all such relocations will be included in the bid. Any relocation of the above items will require written approval by the ENGINEER prior to relocation.

1.13 PUMPING

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

1.14 OWNER OCCUPANCY AND OPERATION OF COMPLETED FACILITIES

- A. The OWNER will not accept portions of the work completed prior to completion of the entire work. This entire project will be tested and completed as a whole.

1.15 EASEMENT FOR WORK ON PRIVATE PROPERTY

- A. The CONTRACTOR will maintain his construction operations within the presently existing road right-of-way, Town-owned properties and easement/agreements obtained by the OWNER (see Section 01002) throughout the project. The CONTRACTOR shall satisfy all of the easement/agreement requirements.
- B. 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 will be responsible for making special agreements with the property owners. Immediately after an award of contract is made, the CONTRACTOR will submit to the OWNER a listing of those areas in which he deems it to be necessary to work outside of the project limits. The listing will be subject to the approval of the OWNER and as construction areas are secured, copies of all written agreements will be placed on file with the OWNER and ENGINEER.
- C. The CONTRACTOR will be responsible for any encroachments on rights-of-way or property of the public or adjoining property owners and will 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 will, 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 will rebuild the affected work or portion of work at the proper location and in full compliance with the Contract Documents.
- D. 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.

- E. In the event the CONTRACTOR is unable to secure the written releases required in the above paragraph, he will 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.

1.16 EXAMINATION OF PRIVATE PROPERTY PRIOR TO CONSTRUCTION

- A. If the CONTRACTOR desires to enter private property to determine their condition prior to construction, the CONTRACTOR will first obtain a letter of permission and introduction from the OWNER.

1.17 CLEAN-UP AND DUST CONTROL

At all times during the prosecution of the work, the CONTRACTOR will maintain sufficient forces to clean up and control dust.

1.18 DAILY REPORTS

- A. The CONTRACTOR will submit daily reports of construction activities, including non-work days. A sample report will be submitted to the ENGINEER for approval. The report will 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 will be submitted for/by each Subcontractor.
- C. The reports will be submitted to the ENGINEER'S Office within two days of the respective report date. Each report will be signed by the CONTRACTOR'S Superintendent or Project Manager.
- D. Information provided on the daily report will not constitute notice of delay or any other notice required by the CONTRACT DOCUMENTS. Notice will be as required therein.

1.19 COORDINATION OF WORK

- A. Because of the nature of this project, the CONTRACTOR should expect other construction to occur in the vicinity of this project during the course of the Contract. In such instances, the CONTRACTOR will be required to cooperate fully so as to eliminate or minimize the creation of

conflicts. Adjustments from time to time may be required in the CONTRACTOR'S work location and/or schedule provided a reasonable notice is given by the OWNER or ENGINEER.

- B. The CONTRACTOR will afford other contractors and the OWNER reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and will properly connect and coordinate the Work with such other work. The CONTRACTOR will coordinate his Work with the OWNER and other contractors to store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the Work as will not unduly interfere with the progress of the Work or the work of any other contractors.
- C. If the execution or result of any part of the Work depends upon any work of the OWNER or of any separate contractor, the CONTRACTOR will, prior to proceeding with the Work, inspect and promptly report to the OWNER in writing any apparent discrepancies or defects in such work of the OWNER or of any separate contractor that render it unsuitable for the proper execution or result of any part of the Work.
- D. Failure of the CONTRACTOR to so inspect and report will constitute an acceptance of the OWNER'S or separate contractor's work as fit and proper to receive the Work, except as to defects which may develop in the OWNER'S or separate contractor's work after completion of the Work and which the CONTRACTOR could not have discovered by its inspection prior to completion of the work.
- E. Should the CONTRACTOR cause damage to the work or property of the OWNER or of any separate contractor on the Project, or to other work on the Site, or delay or interfere with the OWNER'S work on ongoing operations or facilities or adjacent facilities or said separate contractor's work, the CONTRACTOR will be liable for the same; and, in the case of another contractor, the CONTRACTOR will attempt to settle said claim with such other contractor prior to such other contractor's institution of litigation or other proceedings against the CONTRACTOR.
- F. If such separate contractor sues the OWNER on account of any damage, delay or interference caused or alleged to have been so caused by the CONTRACTOR, the OWNER will notify the CONTRACTOR, who will defend the OWNER in such proceedings at the CONTRACTOR'S expense. If any judgment or award is entered against the OWNER, the CONTRACTOR will satisfy the same and will reimburse the OWNER for all damages, expenses, attorney's fees and other costs which the OWNER incurs as a result thereof.
- G. Should a separate contractor cause damage to the Work or to the property of the CONTRACTOR or cause delay or interference with the CONTRACTOR'S performance of the Work, the CONTRACTOR will present directly to said separate contractor any claims it may have as a result of such damage, delay or interference (with an information copy to the OWNER) and will attempt to settle its claim against said separate contractor prior to the institution of litigation or other proceedings against said separate contractor.
- H. In no event will the CONTRACTOR seek to recover from the OWNER or the ENGINEER, and the CONTRACTOR hereby represents to the OWNER and the ENGINEER that it will not seek to recover from them, or either of them, any costs, expenses, (including, but not limited to, attorney's fees) or losses of profit incurred by the CONTRACTOR as a result of any damage to the Work or property of the CONTRACTOR or any delay or interference caused or allegedly caused by any separate contractor.

- I. Any difference or conflict which may arise between the CONTRACTOR and other contractors who may be performing work in behalf of the OWNER, or between the CONTRACTOR and workmen of the OWNER in regard to their work will be adjusted and determined by the ENGINEER. If the work of the CONTRACTOR is delayed because of any acts of omissions of any other contractor of the OWNER, the CONTRACTOR will on that account have no claim against the OWNER other than for an extension of time.

1.20 FINAL GUARANTEE

- A. All work will 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 will, 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 will 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 will 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 will be subject to the terms of this paragraph during the first year of life of each such guarantee. All special guarantees and manufacturers' warranties will be assembled by the CONTRACTOR and delivered to the ENGINEER, along with a summary list thereof, before the acceptance of the work.

1.21 MAINTENANCE SCHEDULES

- A. The CONTRACTOR'S attention is directed to Section 01730 for requirements relative to the submission of operating and maintenance data for the mechanical equipment. For all mechanical equipment furnished, the CONTRACTOR will provide a list including the equipment name, address, and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

1.22 INSTALLATION LISTS

- A. All manufacturers or equipment suppliers who propose to furnish equipment or products under Division 11, 15 and 16 will submit an installation list to the ENGINEER along with the required Shop Drawings.
- B. The installation list will include all installation where identical equipment has been installed and has been in operation for a period of at least one (1) year.

1.23 EMERGENCIES

- A. The CONTRACTOR will 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 will 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 will 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 will 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-hours), the OWNER will have the right to immediately initiate corrective measures, and the cost will 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 will be deducted from the payments due the CONTRACTOR, and the CONTRACTOR will be billed for these services, work and material at prevailing rates.
- C. Accidents will be reported immediately to the Town of Longboat Key Emergency Department and ENGINEER by messenger or phone.

1.24 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 will 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 will perform such restoration by underpinning, repairing, rebuilding, replanting, or otherwise restoring as may be required by the ENGINEER or OWNER, or will 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, 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 USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The scope of this section defines the items included in each bid item in the Bid Proposal of the Specifications for the Town of Longboat Key Potable Water System Subaqueous Crossing of Longboat Pass and System Pressure Controls. Payment will be made based on the specified items included in the description in this section for each bid item.
- B. All contract prices included in the Submitted Bid 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 Submitted Bid will constitute full compensation for all work shown and/or specified to be performed under this project.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 BASE BID

- A. Bonds and Insurance (Item 1)
 - 1. Measurement of the lump sum price established in the Submitted Bid will be based on actual invoice amounts to substantiate the actual bond and insurance premiums.
 - 2. Payment of the lump sum price established in the Submitted Bid will be made at the applicable lump sum amount, as above determined, and will represent full compensation for providing the required 100 percent Payment Bond, 100 percent Performance Bond, all insurance and mobilization/ demobilization in accordance with the requirements of the General Conditions.
- B. Mobilization and Demobilization (Item 2)
 - 1. Measurement
 - a. Measurement of the lump sum price established in the Submitted Bid will be based on the payment schedule in Paragraph 2 for the mobilization, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site, and for the establishment of temporary offices, building facilities, safety equipment and first aid supplies, sanitary and other facilities, as required by these specifications, and state and local laws and regulations. The lump sum price bid for Mobilization shall not exceed two and one-half percent (2.5%) of the Base Bid
 - b. No payments will be made under this lump sum item for the costs of bonds and any required insurance and other preconstruction expense necessary for the start of the work, including the cost of construction materials.

- c. No payments will be made under this lump sum item until the base project schedule has been concurred with by the Owner and Engineer.
- 2. Payment
 - a. Payment of the lump sum price established in the Submitted Bid will be made in accordance with the following schedule:

<u>Percent of Job Completion</u>	<u>Percent of Mobilization Payment</u>
1st Progress Payment with base schedule concurrence	25%
Start of Drilling Operation	50%
Completion of Pipe Pullback	75%
Final Payment	100%

- C. Furnish and Install 16" Pipeline Using HDD with HDPE DR 9 from Station 15+67 to Station 38+38 (Item 3)
 - 1. Measurement of the lump sum price established in the Submitted Bid will be based on a percent complete basis. This work includes but is not limited to directional drilling, installation of 16-in HDPE DR 9 pipeline, flushing, filling with chlorinated solution, testing, and connection to existing pipelines.
 - 2. Payment of the lump sum price will represent full compensation for installation of pipeline using HDD. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item 3.
 - 3. For all pipe installation, the following breakdown shall be used in determining amounts due the Contractor for progress payments:

<u>Work Completed</u>	<u>Percentage Payment of Bid Item (Bid Item Including Pipe Invoice Cost)</u>	
Pipe delivered to Site/Mobilization	5	Percent
Pipe installed by horizontal directional drilling	60	Percent
All pipeline testing satisfactorily completed and pipeline in operation	85	Percent
All pipeline clean up and restoration satisfactorily completed and Draft Record Drawings submitted	95	Percent
Record Drawings satisfactorily Completed	100	Percent

- 4. No payment for horizontal directional drilling shall be made until drilling operations, including pullback of the pipe, are complete and a continuous pipe is installed without defects.

- D. Furnish and Install 16" Pipeline via Open Cut Trench (Item 4)
1. Measurement will be based on the unit price established in the Submitted Bid This work includes but is not limited to excavation, backfill, pipe installation, flushing, filling with chlorinated solution, testing, and connection to existing pipelines, restrained joints, thrust blocks, thrust collars, dewatering, sheeting and shoring, sodding, pavement repair and restoration.
 2. Payment of the unit price will represent full compensation for installation of pipeline. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item 4.
- E. Furnish and Install 6" Pipeline via Open Cut Trench (Item 5)
1. Measurement will be based on the unit price established in the Submitted Bid This work includes but is not limited to excavation, backfill, pipe installation, flushing, filling with chlorinated solution, testing, and connection to existing pipelines, restrained joints, thrust blocks, thrust collars, tapping sleeves and valves, fittings, fire hydrant (with all associated piping, valves and thrust block), dewatering, sheeting and shoring, sodding, pavement repair and restoration.
 2. Payment of the unit price will represent full compensation for installation of pipeline. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item 5.
- F. Furnish and Install ¾" through 3" Water Service Lines via Open Cut Trench (Item 6)
1. Measurement will be based on the unit price established in the Submitted Bid This work includes but is not limited to excavation, backfill, pipe installation, plugs, caps, isolation valves, flushing, filling with chlorinated solution, testing, and connection to existing pipelines, restrained joints, dewatering, sheeting and shoring, sodding, pavement repair and restoration.
 2. Payment of the unit price will represent full compensation for installation of pipeline. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item 6.
- G. Furnish and Install 16" Line Stop (Item 7)
1. Measurement will be based on the unit price established in the Submitted Bid This work includes but is not limited to excavation, backfill, line stop installation, flushing, filling with chlorinated solution, testing, and connection to existing pipelines, restrained joints, thrust blocks, dewatering, sheeting and shoring, sodding, pavement repair and restoration.
 2. Payment of the unit price will represent full compensation for installation of the line stop. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item 7.
- H. Construct Electrical and Instrumentation for Pressure Reducing Valve (Item 8)
1. Measurement of the lump sum price established in the Submitted Bid will be based on a percent complete basis. This work includes but is not limited to installation of instrumentation, electrical, and associated conduit and wiring for the Pressure Reducing Valve (as shown on the plans by others). Installation shall include but not be limited to all miscellaneous work required to successfully complete the installation.
 2. Payment of the lump sum price established in the Submitted Bid will represent full compensation for providing instrumentation, electrical, and associated conduit and wiring. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item 8.
- I. Furnish and Install 16"x6" Tapping Sleeve and Valve (Item 9)

1. Measurement will be based on the unit price established in the Submitted Bid This work includes but is not limited to excavation, backfill, tapping valve and sleeve installation, flushing, filling with chlorinated solution, testing, and connection to existing pipelines, restrained joints, concrete support/thrust blocks, dewatering, sheeting and shoring, sodding, pavement repair and restoration.
 2. Payment of the unit price will represent full compensation for installation of the tapping sleeve and valve and valve box. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item 9.
- J. Furnish and Install Butterfly Valves (Item 10)
1. Measurement will be based on the unit price established in the Submitted Bid This work includes but is not limited to excavation, backfill, valve installation, flushing, filling with chlorinated solution, testing, and connection to existing pipelines, restrained joints, dewatering, sheeting and shoring, sodding, pavement repair and restoration.
 2. Payment of the unit price will represent full compensation for installation of the valves and valve box. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item 10.
- K. Furnish and Install Gate Valve and Hydrant (Item 11)
1. Measurement will be based on the unit price established in the Submitted Bid This work includes but is not limited to excavation, backfill, valve installation, flushing, filling with chlorinated solution, testing, and connection to existing pipelines, restrained joints, dewatering, sheeting and shoring, sodding, pavement repair and restoration.
 2. Payment of the unit price will represent full compensation for installation of the valves and valve box. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item 11.
- L. Furnish and Install Air Release Valves (Item 12)
1. Measurement will be based on the unit price established in the Submitted Bid This work includes but is not limited to excavation, backfill, air release valve installation, flushing, filling with chlorinated solution, testing, and connection to existing pipelines, restrained joints, dewatering, sheeting and shoring, sodding, pavement repair and restoration.
 2. Payment of the unit price will represent full compensation for installation of the air release valves. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item 12.
- M. Indemnification (Item 13)
1. Payment will be made to the CONTRACTOR on a lump sum basis for considerations for indemnification to OWNER and ENGINEER and SUBCONSULTANTS as specified in the General Conditions.
- N. Miscellaneous Work and Cleanup (Item 14)
1. Measurement and payment of the lump sum price established in the Submitted Bid will be based on percent complete of work and will be for compensation for all labor, equipment, and materials required as listed in Section 02999 and as shown on the plans and/ or specified and not included in any other bid item and as obviously required to complete the project.
- O. Florida Power and Light Service Fees Allowance (Item 15)
1. Payment will be made to the CONTRACTOR for extending power service and related service fees. Payment will be made for actual invoiced amounts from Florida Power and Light only.

P. Maintenance of Traffic (Item 16)

1. Payment at the lump sum price bid for this item shall be full compensation for all labor, equipment, materials, and incidentals as specified, necessary to provide Maintenance of Traffic, preparation of traffic control plans; all traffic maintenance and control, including proper signage and Police Officers if required; and all permitting and coordination with the Owner and permitting agencies. The lump sum price bid for Maintenance of Traffic shall not exceed one and one-half percent (1.5%) of the Base Bid. If the CONTRACTOR's cost for Maintenance of Traffic is greater than the maximum allowed, then the additional cost shall be included in the cost for other items of work for the project. Partial payments will be pro-rated throughout the duration of construction of this Project.

Q. Materials Testing Allowance (Item 17)

1. Payment under this bid item shall be in accordance with Payment of General Conditions. Payment of materials testing fees will be based on the actual invoiced amount from the independent testing laboratory to substantiate the actual fees. Payment shall be made to compensate the CONTRACTOR for employing and paying the services of the independent testing laboratory as specified in Section 01410 and to perform all testing specifically indicated on the Contract Documents.

R. Excavation Below Normal Grade and Bedding Rock Refill (Item 18)

1. This is a contingency bid item that may or may not be used on the project. Measurement of excavation below normal grade and refill for open cut trench excavation will extend only downward from the elevation 6-in. below the pipe invert to a depth as
 - a) shown on the Drawings, or if not shown on the Drawings
 - b) determined by the ENGINEER and for a width as defined or approved by the ENGINEER.
2. If the trench bottom is below grade through error by the CONTRACTOR, or if improper drainage softens the subgrade and additional excavation in the trenches is required before laying the pipe, such removal and replacement of material will not be measured for payment.
3. No material which may run or flow into the excavation from outside the payment limits shall be measured for payment.
4. Measurement by truck count will not be permitted.
5. Bedding rock placed outside the above limits will not be measured for payment.
6. Payment for excavation below normal grade and bedding rock refill will be made for the quantity as above determined at the price per cubic yard established in the Bid Submittal, which price and payment shall be full compensation for sheeting, dewatering, excavation, rock and boulder removal, and disposal of all materials below normal grade, furnishing and placing bedding rock refill and all work incidental thereto, for which separate payment is not provided under other items in the Bid Submittal.

3.02 ALTERNATES

A. Additive Alternate No. 1 - Furnish and Install 16" Water Meter and Vault (Item A.1)

1. Measurement of the lump sum price established in the Submitted Bid will be based on a percent complete basis. This work includes but is not limited to installation of fittings, pipe, thrust collar, vault and hatches, electrical, instrumentation, geotechnical, excavation, and backfill. Installation shall include but not be limited to all miscellaneous work required to successfully complete the installation.
2. Payment of the unit price will represent full compensation for installation of the 16" Water Meter and Vault. Payment will also fully compensate the CONTRACTOR any other work which is not specified or shown but is required to complete the work listed in item A.1.

3.03 ROCK AND BOULDER EXCAVATION

- A. No separate measurement and payment shall be made for rock and boulder excavation. Rock is to be excavated as specified in Section 02213.

3.04 TEST PITS

- A. Payment for location of existing utilities and locating unknown utilities is included in the bid form as part of each applicable item. The full cost of the work required to verify and supplement the information provided on the drawings, which is based on the best available information, shall be included in the applicable item.

3.05 EXTRA WORK

- A. Extra work, if any, will be paid for as specified in the General Conditions.

END OF SECTION

SECTION 01152

APPLICATION FOR PAYMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR will submit Applications for Payment once a month to the ENGINEER in accordance with the schedule established by Conditions of the Contract and Agreement Between OWNER and CONTRACTOR.
- B. The accepted Schedule of Values, Section 01370, will be used as the basis for the CONTRACTOR'S Application for Payment.

1.02 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related requirements:
 - 1. Section 01153: Change Order Procedure.
 - 2. Section 01300: Submittals.
 - 3. Section 01370: Schedule of Values.
 - 4. Section 01390: Construction Photographs.
 - 5. Section 01700: Contract Closeout.
 - 6. Section 02999: Miscellaneous Work and Cleanup.

1.03 FORMAT AND DATA REQUIRED

- A. Submit applications. Submit applications as provided in EJCDC documents or similar in accordance with General Conditions.
- B. Provide itemized data on continuation sheet:
 - 1. Format, schedules, line items and values: Those of the Schedule of Values accepted by the ENGINEER.
- C. Provide construction photographs in accordance with Section 01390.

1.04 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

- A. Application Form:
 - 1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.
 - 2. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.
 - 3. Execute certification with signature of a responsible officer of Contract firm.
- B. Continuation Sheets:
 - 1. Fill in total list of all scheduled component items of Work, with item number and scheduled dollar value for each item.

2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored.
 - a. Round off values to nearest dollar, or as specified for Schedule of Values.
3. List each Change Order executed prior to date of submission, at the end of the continuation sheets.
 - a. List by Change Order Number, and description, as for an original component item of work.
4. To receive approval for payment on component material stored on site, submit copies of the original paid invoices with the application for payment.

1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. When the OWNER or the ENGINEER requires substantiating data, CONTRACTOR will submit suitable information, with a cover letter identifying:
 1. Project.
 2. Application number and date.
 3. Detailed list of enclosures.
 4. For stored products:
 - a. Item number and identification as shown on application.
 - b. Description of specific material.
- B. Submit one copy of data and cover letter for each copy of application.
- C. The CONTRACTOR is to maintain an updated set of drawings to be used as record drawings in accordance with Section 01720. As a prerequisite for monthly progress payments, the CONTRACTOR is to exhibit the updated record drawings for review by the OWNER and the ENGINEER.
- D. CONTRACTOR will maintain an updated construction schedule in accordance with Section 01310. As a prerequisite for monthly progress payments, CONTRACTOR will submit the updated construction schedule with the applications for progress payments. If the CONTRACTOR fails to submit the required updated schedule within the time prescribed, the ENGINEER may withhold approval of progress payment estimates until such a time as the CONTRACTOR submits the required updated schedule.

1.06 PREPARATION OF APPLICATION FOR FINAL PAYMENT

- A. Fill in Application form as specified for progress payments.
- B. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.
- C. Submit all Project Record Documents in accordance with Section 01720.

1.07 SUBMITTAL PROCEDURE

- A. Submit Applications for Payment to the ENGINEER at the times stipulated in the Agreement.
- B. Number: Three copies with original signatures of each Application. (One copy to the OWNER and two copies to the ENGINEER).

- C. When the ENGINEER finds Application properly completed and correct, he will transmit certificate for payment to OWNER, with copy to CONTRACTOR.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01153

CHANGE ORDER PROCEDURES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR will promptly implement change order procedures.
 - 1. Provide full written data required to evaluate changes.
 - 2. Maintain detailed records of work done on a time-and-material/force account basis.
 - 3. Provide full documentation to ENGINEER on request.
- B. Designate in writing the member of CONTRACTOR's organization:
 - 1. Who is authorized to accept changes in the work.
 - 2. Who is responsible for informing others in the CONTRACTOR's employ of the authorization of changes in the work.
- C. OWNER will designate in writing the person who is authorized to execute Change Orders.

1.02 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related requirements:
 - 1. Section 01152: Applications for Payment.
 - 2. Section 01310: Construction Schedules.
 - 3. Section 01370: Schedule of Values
 - 4. Section 01720: Project Record Documents.

1.03 DEFINITIONS

- A. Change Order: See General Conditions.
- B. Field Order: A written order to the CONTRACTOR, signed by the ENGINEER and the CONTRACTOR, which is issued to interpret/clarify the Contract Documents, order minor changes in the work and/or memorialize trade-off agreements. The work described by a Field Order is to be accomplished without change to the Contract Sum, Contract Time, and/or claims for other costs.
- C. Construction Change Directive or Work Change Directive – See General Conditions Section 00700.

1.04 PRELIMINARY PROCEDURES

- A. OWNER or ENGINEER may initiate changes by submitting a Request for Proposal (RFP) to Contractor. Request will include:
 - 1. Detailed description of the Change, Products, and location of the change in the Project.
 - 2. Supplementary or revised Drawings and Specifications
 - 3. The projected time span for making the change, and a specific statement as to whether overtime work is, or is not, authorized.
 - 4. A specific period of time during which the requested price will be considered valid.

5. Such request is for information only, and is not an instruction to execute the changes, nor to stop work in progress.

- B. CONTRACTOR may initiate changes by submitting a written notice to ENGINEER containing:
 1. Description of the proposed changes.
 2. Statement of the reason for making the changes.
 3. Statement of the effect on the Contract Sum and the Contract Time.
 4. Statement of the effect on the work of separate contractors.
 5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

1.05 CONSTRUCTION OR WORK CHANGE DIRECTIVE AUTHORIZATION

- A. In lieu of a Request for Proposal (RFP), ENGINEER may issue a Work Change Directive Authorization of CONTRACTOR to proceed with a change for subsequent inclusion in a Change Order.
- B. Authorization will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change, and will designate the method of determining any change in the Contract Sum and any change in Contract Time.
- C. OWNER and ENGINEER will sign and date the Work Change Directive Authorization as authorization for the CONTRACTOR to proceed with the changes.
- D. CONTRACTOR may sign and date the Work Change Directive Authorization to indicate agreement with the terms therein.

1.06 DOCUMENTATION OF PROPOSALS AND CLAIMS

- A. Support each quotation for a lump-sum proposal, and for each unit price which has not previously been established, with sufficient substantiating data to allow ENGINEER to evaluate the quotation.
- B. On request, provide additional data to support time and cost computations
 1. Labor required.
 2. Equipment required.
 3. Products required.
 - a. Recommended source of purchase and unit cost.
 - b. Quantities required.
 4. Taxes, insurance and bonds.
 5. Credit for work deleted from Contract, similarly documented.
 6. Overhead and profit.
 7. Justification for any change in Contract Time.
- C. Support each claim for additional costs, and for work done on a time-and-material/force account basis, with documentation as required for a lump-sum proposal, plus additional information.
 1. Name of the OWNER's authorized agent who ordered the work, and date of the order.
 2. Dates and times work was performed, and by whom.
 3. Time record, summary of hours worked, and hourly rates paid.
 4. Receipts and invoices for:
 - a. Equipment used, listing dates and times of use.
 - b. Products used, listing of quantities.

c. Subcontracts.

1.07 PREPARATION OF CHANGE ORDERS AND FIELD ORDERS

- A. ENGINEER will prepare each Change Order and Field Order.
- B. Forms: Provided by ENGINEER.
- C. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.
- D. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.
- E. Field Order will describe interpretations or clarifications of Contract Documents, approve minor changes in the Work, and/or memorialize trade-off agreements.
- F. Field Order work will be accomplished without change in the Contract sum, Contract Time, and/or claims for other costs.

1.08 LUMP-SUM/FIXED PRICE CHANGE ORDER

- A. Content of Change Orders will be based on, either:
 - 1. ENGINEER's Proposal Request and CONTRACTOR's responsive Proposal as mutually agreed between OWNER and CONTRACTOR.
 - 2. CONTRACTOR's Proposal for a change, as recommended by ENGINEER.
- B. CONTRACTOR will sign and date the Change Order to indicate agreement with the terms therein.
- C. OWNER and ENGINEER will sign and approve Change Order submitted by CONTRACTOR and date the Change Order as authorization for the CONTRACTOR to proceed with the changes.

1.09 UNIT PRICE CHANGE ORDER

- A. Content of Change Orders will be based on, either:
 - 1. ENGINEER's definition of the scope of the required changes.
 - 2. CONTRACTOR's Proposal for a change, as recommended by ENGINEER.
 - 3. Survey of complete work.
- B. The amounts of the unit prices to be:
 - 1. Those stated in the Agreement.
 - 2. Those mutually agreed upon between OWNER and CONTRACTOR.
- C. When quantities of the items cannot be determined prior to start of the work:
 - 1. The OWNER through the ENGINEER will issue a work change directive directing CONTRACTOR to proceed with the change on the basis of unit prices, and will cite the applicable unit prices.
 - 2. At completion of the change, ENGINEER will determine the cost of such work based on the unit prices and quantities used.
 - a. CONTRACTOR will submit documentation to establish the number of units of each item and any claims for a change in Contract Time.

3. ENGINEER will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.
4. OWNER and CONTRACTOR will sign and date the Change Order to indicate their agreement with the terms therein.

1.10 TIME AND MATERIAL/FORCE ACCOUNT CHANGE ORDER/WORK CHANGE
DIRECTIVE AUTHORIZATION

- A. The OWNER through the ENGINEER will issue a Work change Directive Authorization directing CONTRACTOR to proceed with the changes.
- B. At completion of the change, CONTRACTOR will submit itemized accounting and supporting data as provided in the Article "Documentation of Proposals and Claims" of this Section.
- C. ENGINEER will determine the allowable cost of such work, as provided in General Conditions and Supplementary Conditions.
- D. ENGINEER will sign and date the Change Order to establish the change in Contract sum and in Contract Time.
- E. OWNER and CONTRACTOR will sign and date the Change Order to indicate their agreement therewith.

1.11 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. Periodically revise Schedule of Values and Application Payment forms to record each change as a separate item of Work, and to record the adjusted Contract Sum.
- B. Periodically revise the Construction Schedule to reflect each change in Contract Time.
 1. Revise subschedules to show changes for other items of work affected by the changes.
- C. Upon completion of work under a Change Order, enter pertinent changes in Project Record Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01170

ADDITIONAL PROJECT PROVISIONS

PART 1 – GENERAL

1.01 GENERAL OBLIGATIONS OF THE CONTRACTOR

- A. General obligations of the CONTRACTOR shall be as set forth in the Contract Documents. Unless special payment is specifically provided in Section 01150, all incidental work and expense in connection with the completion of work under the Contract will be considered a subsidiary obligation of the CONTRACTOR and all such costs shall be included in the appropriate items in the Bid Form in connection with which the costs are incurred.

1.02 SITE INVESTIGATION

- A. The CONTRACTOR shall satisfy himself as to the conditions existing within the project area, the type of equipment required to perform the work, the character, quality and quantity of the subsurface materials to be encountered insofar from an inspection of the site, as well as from information presented by the Drawings and related Sections. CONTRACTOR shall get his own geotechnical information if he/she deems it necessary. Any failure of the CONTRACTOR to acquaint himself with the available information will not relieve him from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The OWNER assumes no responsibility for any conclusions or interpretation made by the CONTRACTOR on the basis of the information made available by the OWNER.
- B. Also refer to Specification Section 02220 for additional geotechnical requirements.

1.03 COORDINATION WITH LOCAL AGENCIES

- A. Supply OWNER with the following information.
 - 1. Immediate notification of any drain, gas, sewer, force main, reclaimed water, or potable water main breaks.
- B. Reimburse the OWNER for the actual cost of the services of personnel required during other than regular working hours. The emergency contact number for the ENGINEER during non-business hours will be provided at the pre-construction conference and will be updated as necessary.

1.04 PUBLIC UTILITIES

- A. Provide the Utility Companies with a schedule of the activities in areas where the utilities exist.
- B. Notify utility companies of any damage to their utilities resulting from construction operations.
- C. Notify Sunshine at 1-800-432-4770 at least seven (7) days before digging, trenching, demolishing, backfilling, grading, landscaping or other earth moving operations in any public ways, rights of way and easements.

1.05 PROGRESS SCHEDULE

- A. Submit a progress schedule before starting any work, in accordance with Section 01310.

- B. Review the progress schedule with the ENGINEER on a monthly basis or more frequently as required by the ENGINEER. The progress schedule shall be adjusted as required in accordance with the General Conditions.

1.06 PERMITS

- A. Obtain all necessary permits required for proper execution of the project (except permits to be provided by OWNER as specified in Section 01065). Fill out all forms and furnish all drawings required to obtain the permits. A copy of each permit shall be submitted to the ENGINEER. All fees associated with these permits shall be paid by the CONTRACTOR as part of the work. Work shall not commence on any phase of the work requiring a permit until the permit is obtained.
- B. Obtain required street opening permits for excavations within streets or sidewalk areas.

PART 2 – PRODUCT (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The ENGINEER will schedule and administer the pre-construction meeting, periodic progress meetings, and specially called meetings throughout progress of the Work. The ENGINEER will:
 - 1. Prepare agenda for meetings.
 - 2. Make physical arrangements for meetings.
 - 3. Preside at meetings.
 - 4. Record the minutes; include significant proceedings and decisions.
 - 5. Reproduce and distribute copies of minutes within five (5) working days after each meeting.
 - a. To participants in the meeting.
 - b. To parties affected by decisions made at the meeting.
- B. Representatives of CONTRACTOR, subcontractors and suppliers attending meetings will be qualified and authorized to act on behalf of the entity each represents.
- C. The CONTRACTOR will attend meetings to ascertain that work is expedited consistent with Contract Documents and construction schedules.

1.02 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related requirements:
 - 1. Information to Bidders.
 - 2. Section 01300: Submittals.
 - 3. Section 01700: Contract Closeout.
 - 4. Section 01730: Operating and Maintenance Data.
 - 5. Section 02413: Horizontal Directional Drilling

1.03 PRE-CONSTRUCTION MEETING

- A. Schedule a preconstruction meeting prior to the date of Notice to Proceed.
- B. Location: A central site, convenient for all parties, designated by the OWNER.
- C. Attendance:
 - 1. OWNER's Representative.
 - 2. ENGINEER and his professional consultants.
 - 3. Resident Project Representative.
 - 4. CONTRACTOR's Superintendent.
 - 5. Major Subcontractors.
 - 6. Major suppliers.
 - 7. Utilities
 - 8. Others as appropriate.

D. Suggested Agenda:

1. Distribution and discussion of:
 - a. List of major subcontractors and suppliers.
 - b. Projected Construction Schedules.
2. Critical work sequencing.
3. Major equipment deliveries and priorities.
4. Project Coordination.
 - a. Designation of responsible personnel.
5. Procedures and processing of:
 - a. Field decisions.
 - b. Proposal requests.
 - c. Submittals.
 - d. Change Orders.
 - e. Applications for Payment.
6. Adequacy of distribution of Contract Documents.
7. Procedures for maintaining Record Documents.
8. Use of premises:
 - a. Office, work and storage areas.
 - b. OWNER's requirements.
9. Construction facilities, controls and construction aids.
10. Temporary utilities.
11. Housekeeping procedures.

1.04 PROGRESS MEETINGS

- A. Schedule regular periodic meetings. The progress meetings will be held at least monthly with the first meeting no more than 30 days after the pre-construction meeting or no more than 30 days after the date of Notice to Proceed.
- B. Hold called meetings as required by progress of the Work.
- C. Location of the meetings: Project field office of CONTRACTOR or other location designated by the OWNER.
- D. Attendance:
 1. OWNER or his representative.
 2. ENGINEER, and his professional consultants as needed.
 3. CONTRACTOR's Superintendent.
 4. Subcontractors as appropriate to the agenda.
 5. Suppliers as appropriate to the agenda.
 6. Others as appropriate.
- E. Suggested Agenda:
 1. Review, approval of minutes of previous meeting.
 2. Review of work progress since previous meeting.
 3. Progress, schedule, during succeeding work period.
 4. Field observations, problems, conflicts.
 5. Problems which impede Construction Schedule.
 6. Review of off-site fabrication, delivery schedules.
 7. Corrective measures and procedures to regain projected schedule.
 8. Revisions to Construction Schedule.

9. Coordination of schedules.
10. Review submittal schedules; expedite as required.
11. Maintenance of quality standards.
12. Pending changes and substitutions.
13. Review proposed changes for:
 - a. Effect on Construction Schedule and on completion date.
 - b. Effect on other contracts of the Project.
14. Other business.
15. Construction schedule.
16. Critical/long lead items.

- F. The CONTRACTOR is to attend progress meetings and is to study previous meeting minutes and current agenda items, in order to be prepared to discuss pertinent topics such as deliveries of materials and equipment, progress of the Work, etc.
- G. The CONTRACTOR is to provide a current submittal log at each progress meeting in accordance with Section 01300.

1.05 RISK MITIGATION MEETINGS

- A. See Section 02413 for additional requirements for Risk Mitigation Meetings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR will 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 will 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 will bring this log to each scheduled progress meeting with the OWNER and the ENGINEER. This log will be organized using the ten (10) character numbering system in subparagraph 1.06 F. 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. Approved
 - b. Approved As Noted
 - c. Approved As Noted/Confirm
 - d. Not Approved/Resubmit
 - e. Not Approved
 - 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.
 - 10. Project Name and Number.

1.02 SHOP DRAWINGS

- A. When used in the Contract Documents, the term "shop drawings" will be considered to mean CONTRACTOR's plans for material and equipment which become an integral part of the Project. These drawings will be complete and detailed. Shop drawings will 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 will 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 will be made and noted on the shop drawings before being submitted for approval.

- C. See Shop Drawing Schedule requirements in subparagraph 1.07 CONTRACTOR'S responsibility.

1.03 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.

1.04 WORKING DRAWINGS

- A. When used in the Contract Documents, the term "working drawings" will 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 will be signed and sealed by a registered Professional Engineer, currently licensed to practice in the State and will 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 will have no responsibility therefore.

1.05 SAMPLES

- A. The CONTRACTOR will furnish, for the approval of the ENGINEER, samples required by the Contract Documents or requested by the ENGINEER. Samples will be delivered to the ENGINEER as specified or requested and in quantities and sizes as specified. A minimum of two samples of each item will be submitted unless otherwise specified. The CONTRACTOR will pre-pay all shipping charges on samples. Materials or equipment for which samples are required will 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 will prepare a transmittal letter in triplicate for each shipment of samples. The CONTRACTOR will enclose a copy of this letter with the shipment and send a copy of this letter to the ENGINEER. Approval of a sample will be only for the characteristics or use named in such approval and will not be construed to change or modify any Contract requirements.

- D. Approved samples not destroyed in testing will be sent to the ENGINEER or stored at the site of the work. Materials and equipment incorporated in work will 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.

1.06 SUBMITTAL REQUIREMENTS

- A. The CONTRACTOR will 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 will submit three (3) copies plus one electronic copy in *.pdf format of all Shop Drawings for the ENGINEER to review, of which the ENGINEER will retain two (2) sets.
- C. All submittals will be made directly to the Office of the ENGINEER.
- D. Shop drawings, product data, working drawings and samples will 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 where the product is found in the contract drawings.
 - 6. CONTRACTOR Certification Statement.
 - 7. Submittal Identification Number.
 - 8. Contract Drawing Number Reference.
 - 9. Project Name and Number.
- E. In accordance with subparagraph 1.07 A, each shop drawing, working drawing, sample, and catalog data submitted by the CONTRACTOR will 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. The CONTRACTOR will utilize a 4 -character submittal identification numbering system in the following manner:
 - 1. The first character will be a D, S, P, M, or R, which represents Shop/Working Drawing and other Product Data (D), Sample (S), Preliminary Submittal (P), Operating/Maintenance Manual (M), or Request for Information (R).
 - 2. The next five digits will be the applicable Specification Section Number.
 - 3. The next three digits will be the numbers 001-999 to sequentially number each initial separate item or drawing submitted under each specific Section number.

4. The last character will be a letter, indicating the submission, or resubmission of the same Drawing, i.e., A=1st submission, B=2nd submission, C=3rd submission, etc. A typical submittal number would be as follows:

D-03300-008.B

D	=	Shop Drawing
03300	=	Specification Section for Concrete
008	=	The eighth initial submittal under this specification section
B	=	The second submission (first resubmission) of that particular shop drawing.

- G. 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 will 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 will be implemented where appropriate. If the CONTRACTOR fails to describe such variations he will 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/OWNER.
- H. Data on materials and equipment will 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.
- I. For all mechanical and electrical equipment furnished, the CONTRACTOR will 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 will be submitted as specified in Section 01730.
- J. All MANUFACTURERS or equipment suppliers who propose to furnish equipment or products under Divisions 11, 13, 15 and 16 will submit an installation list to the ENGINEER along with the required shop drawings. The installation list will include all installations where identical equipment has been installed and has been in operation for a period of at least one (1) year.
- K. The CONTRACTOR will use the color "green" to make his remarks on the Submittals. Only the ENGINEER will utilize the color "red" in marking submittals.
- L. Facsimiles or copies of facsimiles will not be accepted for review.

1.07 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" will bear CONTRACTOR'S stamp showing that they have been so checked and approved. Drawings or data sheets 11"x17" and smaller will be bound together in an orderly fashion and bear

the CONTRACTOR'S stamp on the cover sheet. The cover sheet will 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 will 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 will 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 will furnish the ENGINEER a Shop Drawing schedule 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 will be provided as a separate entity and indicate those submittals that are critical to the progress schedule. The CONTRACTOR will 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 will 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 will 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 will 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 will be sent directly to the CONTRACTOR for checking. The CONTRACTOR will 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 will 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 will be returned to the subcontractors for correction before submission to the ENGINEER.

- J. Requests for Information (RFI) will be submitted on a standard form provided by the ENGINEER. RFIs will 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.

1.08 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 will 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 will 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 (1.06G), and show a departure from the Contract requirements which the 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 codes.

Code 1 - "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.

Code 2 - "APPROVED AS NOTED" is assigned when notations or comments have been made on the submittal pointing out minor discrepancies as compared with the Contract Documents. Resubmittal or confirmation is not necessary prior to release for manufacturing.

Code 3 - "APPROVED AS NOTED/CONFIRM." This combination of codes is assigned when a confirmation of the notations and comments is required by the CONTRACTOR. The CONTRACTOR may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product. This confirmation is to address the omissions and/or nonconforming items that were noted. Only the items to be "confirmed" need to be resubmitted.

Code 4 - "NOT APPROVED/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.

Code 5 - "NOT APPROVED" 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.

Code 6 - "COMMENTS ATTACHED" is assigned where there are comments attached to the returned submittal which provide additional data to aid the CONTRACTOR.

Code 7 - "FOR YOUR INFORMATION" is assigned when the package provides information of a general nature that may or may not require a response.

Codes 1 through 5 designate the status of the reviewed submittal with Code 6 showing there has been an attachment of additional data. Code 7 is used as may be necessary.

- E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the CONTRACTOR will 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 will be made at the risk of the CONTRACTOR. The CONTRACTOR will 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 will 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 will 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 will carry out the construction in accordance therewith and will 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 marked as incomplete, and will be considered "Not Approved" until resubmitted. The ENGINEER may at his option provide a list or mark the submittal directing the CONTRACTOR to the areas that are incomplete.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01310

CONSTRUCTION SCHEDULES (BAR CHART)

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Promptly after the award of the Contract and within five days after the effective date of the Agreement, prepare and submit to the ENGINEER estimated construction progress schedules for the Work, with subschedules of related activities which are essential to its progress.
- B. Submit revised progress schedules on a monthly basis.
- C. No partial payments will be approved by the ENGINEER until there is an approved construction progress schedule on hand.
- D. The CONTRACTOR will designate an authorized representative of his firm who will be responsible for development and maintenance of the schedule and of progress and payment reports. This representative of the CONTRACTOR will have direct project control and complete authority to act on behalf of the CONTRACTOR in fulfilling the commitments of the CONTRACTOR'S schedule.

1.02 RELATED REQUIREMENTS

- A. Standard General Conditions of the Construction Contract.
- B. Section 01010: Summary of Work.
- C. Section 01200: Project Meetings.
- D. Section 01300: Submittals.

1.03 FORM OF SCHEDULES

- A. Schedule diagrams and reports shall be generated using the latest version of Suretrak or Primavera Project Planner.
- B. Prepare schedules in the form of a horizontal bar chart.
 - 1. Provide a separate horizontal bar for each trade or operation within each structure or item.
 - 2. Horizontal time scale: In weeks from the start of construction and identify the first work day of each month.
 - 3. Scale and spacing: To allow space for notations and future revisions.
 - 4. Minimum sheet size: 11 inches x 17 inches.
- C. Format of listings: The chronological order of the start of each item of work for each structure.
- D. Identification of listings: By major specification section numbers as applicable and structure.

1.04 CONTENT OF SCHEDULES

- A. Construction Progress Schedule:
 - 1. Show the complete sequence of construction by activity.
 - 2. Show the dates for the beginning of, and completion of, each major element of construction in no more than a two-week increment scale.
 - 3. Show projected percentage of completion for each item, as of the first day of each month.
 - 4. Show projected dollar cash flow requirements for each month of construction.
- B. Submittals Schedule for Shop Drawings, and Samples in accordance with Section 01300. Show:
 - 1. The dates for CONTRACTOR'S submittals.
 - 2. The date's submittals will be required for OWNER-furnished products, if applicable.
 - 3. The dates approved submittals will be required from the ENGINEER.
- C. A typewritten list of all long lead items (equipment, materials, etc.)

1.05 PROGRESS REVISIONS

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of a schedule:
 - 1. Major changes in scope.
 - 2. Activities modified since previous submission.
 - 3. Revised projections of progress and completion.
 - 4. Other identifiable changes.
- C. Provide a narrative report as needed to define:
 - 1. Problem areas, anticipated delays, and the impact on the schedule.
 - 2. Corrective action recommended, and its effect.

1.06 SUBMISSIONS

- A. Submit initial schedules to the ENGINEER within five days after the effective date of the Agreement.
 - 1. The ENGINEER will review schedules and return review copy within 14 days after receipt.
 - 2. If required, resubmit within seven days after return of review copy.
- B. Submit revised monthly progress schedules with that month's application for payment.
- C. Submit four (4) printed copies and one electronic copy on a data CD for both the initial and monthly submittals for review.

1.07 DISTRIBUTION

- A. Distribute copies of the reviewed schedules to:
 - 1. ENGINEER. (Two copies.)
 - 2. Job's site file.
 - 3. Subcontractors.
 - 4. Other concerned parties.
 - 5. OWNER (two copies).

- B. Instruct recipients to report promptly to the CONTRACTOR, in writing, any problems anticipated by the projections shown in the schedules.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 RESPONSIBILITY FOR SCHEDULE COMPLIANCE

- A. The CONTRACTOR agrees that whenever it becomes apparent from the current monthly schedule that delays to the critical path have resulted, and hence, that the contract completion date will not be met or when so directed by the ENGINEER, he/she will take some or all of the following actions at no additional cost to the OWNER, submitting to the ENGINEER for approval, a written statement of the steps he intends to take to remove or arrest the delay to the critical path in the approved schedule.
 - 1. Increased construction manpower in such quantities and crafts as will substantially eliminate, in the judgment of the ENGINEER, the backlog of work.
 - 2. Increase the number of working hours per shift, shifts per working days per week, the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate, in the judgment of the ENGINEER, the backlog of work.
 - 3. Reschedule activities to achieve maximum practical concurrency of accomplishment of activities, and comply with the revised schedule.
 - 4. Costs incurred by the OWNER arising from such lengthening of hours, including furnishing of Inspectors, will be the CONTRACTOR'S responsibility and will be deducted from monies due him. Failure of the CONTRACTOR to comply with the requirements of the ENGINEER may be grounds for determination by the OWNER that the CONTRACTOR is not proceeding at such rates as will ensure completion within the specified time and may result in the termination of the right of the CONTRACTOR to continue the work.

3.02 ADJUSTMENT OF CONTRACT SCHEDULE AND COMPLETION TIME

- A. If the CONTRACTOR desires to make changes in his method of operating which effect the approved schedule, he will notify the ENGINEER in writing, stating what changes are proposed and the reason for the change. If the ENGINEER approves these changes, the CONTRACTOR will revise and submit for approval, without additional cost to the OWNER, all of the affected portion of the schedule. The schedule will be adjusted by the CONTRACTOR only after prior approval of his proposed changes by the ENGINEER.
- B. Adjustments may consist of changing portions of the activity sequence and/or activity durations, division of approved activities, or other adjustments as may be approved by the ENGINEER. The addition of extraneous, non-working activities and/or activities which add unapproved restraints to the schedule will not be approved.
- C. If the completion of any activity, whether or not critical, falls more than 100 percent behind its approved duration, the CONTRACTOR will submit for approval a schedule adjustment showing each such activity divided into two activities reflecting completed versus uncompleted work.
- D. Shop Drawings which are not approved on the first submittal or within the scheduled time will be immediately rescheduled.
- E. The contract completion time will be adjusted only for causes specified in this contract. In the

event the CONTRACTOR requests an extension of any contract completion date, he/she will furnish such justification and supporting evidence as the ENGINEER may deem necessary for a determination as to whether the CONTRACTOR is entitled to an extension of time under the provisions of this contract. The ENGINEER will, after receipt of such justification and supporting evidence make findings of fact and will advise the CONTRACTOR in writing thereof. If the ENGINEER finds that the CONTRACTOR is entitled to any extension of any contract completion date under the provisions of this Contract, the ENGINEER'S determination as to the total number of days extension will be based upon the currently approved schedule and on all data relevant to the extension. Such data will be included in the next monthly updating of the schedule. Any extension of contract time must be approved by the OWNER and a Change Order must be processed. The CONTRACTOR acknowledges and agrees that actual delays in activities which, according to the schedule, do not affect any contract completion date shown by the critical path in the schedule do not have any effect on the Contract completion date or dates, and therefore, will not be the basis for a change.

- F. From time to time it may be necessary for the contract schedule and/or completion time to be adjusted by the ENGINEER to reflect the effects of job conditions, weather, technical difficulties, strikes, unavoidable delays on the part of the OWNER or his representatives, and other unforeseeable conditions which may indicate schedule adjustments and/or completion time extension. Under such conditions, the CONTRACTOR will reschedule the work and/or Contract completion time to reflect the changed conditions, and the CONTRACTOR will revise his schedule accordingly. No additional compensation will be made to the CONTRACTOR for such schedule changes except for unavoidable overall contract time extensions beyond the actual completion of all unaffected work in the Contract, in which case the CONTRACTOR will take all possible action to minimize any time extension and any additional cost to the OWNER. It is specifically pointed out that the use of available float time in the schedule may be used by the OWNER as defined by the ENGINEER, as well as by the CONTRACTOR. Float time is defined as the amount of time between the early start date, and the late start date, or the early finish date and the late finish date, of any of the activities in the schedule.
- G. The OWNER controls the float time in the approved schedule and, therefore, without obligation to extend either the overall completion date or any intermediate completion dates set out in the schedule, the OWNER may initiate changes to the contract work that absorb float time only. OWNER-initiated changes that affect the critical path on the approved schedule will be the sole grounds for extending (or contracting) said completion dates. CONTRACTOR-initiated changes that encroach on the float time identified in the approved schedule may be accomplished with the OWNER'S concurrence. Such changes, however, will give way to OWNER-initiated changes competing for the same float time.

END OF SECTION

SECTION 01370

SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR will submit to the ENGINEER a Schedule of Values allocated to the various portions of the Work, within seven (7) calendar days after the effective date of the Agreement.
- B. Upon request of the ENGINEER, support the values with data which will substantiate their correctness.
- C. The accepted Schedule of Values will be used only as the basis for the CONTRACTOR's Applications for Payment.

1.02 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related requirements:
 - 1. Standard General Conditions.
 - 2. Section 01152: Applications for Payment.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. Format schedule on an 8-1/2 inch x 14 inch white paper. Identify schedule with:
 - 1. Title of Project and location.
 - 2. ENGINEER and Project number.
 - 3. Name and Address of CONTRACTOR.
 - 4. Contract designation.
 - 5. Date of submission.
- B. Schedule will 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. Identify each line item with the number and title of the respective major section of the specifications.
- D. For each major line item list sub-values of major products or operations under the item.
- E. For the various portions of the Work:
 - 1. Each item will include a directly proportional amount of the CONTRACTOR's overhead and profit.
 - 2. For items on which progress payments will be requested for stored materials, break down the value into:
 - a. The cost of the materials, delivered and unloaded, with taxes paid. Paid invoices are required for materials upon request by the ENGINEER.
 - b. The total installed value.
- F. The sum of all values listed in the schedule will equal the total Contract Sum.

1.04 SUBSCHEDULE OF UNIT MATERIAL VALUES

- A. Submit a sub-schedule of unit costs and quantities for:
 - 1. Products on which progress payments will be requested for stored products.
- B. The form of submittal will 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 will include an allowance for normal waste.
- D. The unit values for the materials will be broken down into:
 - 1. Cost of the material, delivered and unloaded at the site, with taxes paid.
 - 2. Copies of invoices for component material will be included with the payment request in which the material first appears.
 - 3. Paid invoices will be provided with the second payment request in which the material appears or no payment will be allowed and/or may be deleted from the request.
- E. The installed unit value multiplied by the quantity listed will equal the cost of that item in the Schedule of Values.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01380

AUDIO VIDEO TAPING

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials and equipment and furnish color audio video taping of the project site as specified herein.
- B. Furnish to the OWNER an original and one copy of a continuous color audio video tape recording along the entire boundary of the proposed project. The recording shall be taken prior to any construction activity.
- C. The OWNER reserves the right to reject the audio video taping because of poor quality, unintelligible audio or uncontrolled pan or zoom. Any taping rejected by the OWNER shall be retaped at no cost to the OWNER. Under no circumstances shall construction begin until the OWNER has received and accepted the audio video tape(s).
- D. The taping shall be performed by a qualified, established audio video taping firm knowledgeable in construction practices and experienced in the implementation of established inspection procedures.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 COLOR AUDIO VIDEO SURVEY

- A. Furnish a continuous color audio tape recording along the entire boundary of the proposed project.
- B. Coverage shall include, but not be limited to, all existing roadways, sidewalks, curbs, driveways, buildings and structures, above ground utilities, landscaping, trees, signage and other physical features located within the zone of influence of the construction. The coverage may be expanded if directed by Engineer.
- C. All taping will be done during daylight hours. No taping shall be performed if weather is not acceptable, such as rain, fog, etc.
- D. Audio video recording to be performed at each major stage of activity or as deemed fit by Engineer during construction of project works.

3.02 AUDIO AND VIDEO

- A. Audio/video shall be professional grade, standard DVD format.
- B. Each disk shall begin with the OWNER's name, Contract name and number, CONTRACTOR's name, date and location information such as street name, direction of travel, viewing side, etc.

- C. Information appearing on the disk must be continuous and run simultaneously by computer generated transparent digital information. No editing or overlaying of information at a later date will be acceptable.
- D. Digital information will be as follows:
 - 1. Upper left corner
 - a. Name of CONTRACTOR
 - b. Day, Date and Time
 - c. Name of Project
 - 2. Lower left corner
 - a. Route of travel
 - b. Viewing side
 - c. Direction of travel
 - d. Stationing
- E. Time must be accurate to within 1/10 of a second and continuously generated.
- F. Engineering station numbers must be continuous, be accurate and correspond to project stationing. The symbols should be the standard engineering symbols (i.e. 16+64).
- G. Written documentation must coincide with the information on the tape so as to make easy retrieval of locations sought for at a later date.
- H. The video system shall have the capability to transfer individual frames of video electronically into hard copy prints or photographic negatives.
- I. Audio shall be recorded at the same time as the video recording and shall have the same information as on the viewing screen. Special commentary will be given for unusual conditions of buildings, sidewalks and curbing, foundations, trees and shrubbery, etc.
- J. All disks and boxes shall bare labels with the following information:
 - 1. Disk Number
 - 2. OWNER's Name
 - 3. Date of Taping
 - 4. Project Name and Number
 - 5. Location and Standing Limit of Tape

END OF SECTION

SECTION 01390

CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Employ competent photographer to take construction record photographs periodically during course of the Work.

1.02 PHOTOGRAPHY REQUIRED

- A. Provide photographs taken on cutoff date for each scheduled Application for Payment.
- B. For each project location, provide monthly photographs at each major stage of activity prior to any construction in addition to the preconstruction video of the entire project.
- C. Views and quantities required:
 - 1. At each specified time, photograph project from a minimum of three (3) different views all Work and at least one (1) view every 100 feet for all pipeline Work, as approved by the ENGINEER.
 - 2. Provide four (2) prints of each view.
 - 3. Provide four (2) CD ROM disks containing digital photographs of each view for the monthly submittal.
- D. Negatives:
 - 1. The photographer shall maintain file copies for a period of two (2) years from Date of Substantial Completion of entire project and then shall convey all files to the OWNER.
 - 2. Photographer shall agree to furnish additional prints to OWNER and the ENGINEER at commercial rates applicable at time of purchase. Photographer shall also agree to participate as required in any litigation requiring the photographer as an expert witness.

1.03 COSTS OF PHOTOGRAPHY

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

PART 2 - PRODUCTS

2.01 PRINTS

- A. Color:
 - 1. Paper: Single weight, color print paper.
 - 2. Finish: Smooth surface, glossy.
 - 3. Size: 8-inch x 10-inch.
- B. Identify each print on back, listing:
 - 1. Name of Project.
 - 2. Orientation of View.
 - 3. Date and time of exposure.

4. Name and address of photographer.
5. Photographer's numbered identification of exposure.
6. Identify each digital file of the scanned photograph by date and photograph number.

PART 3 - EXECUTION

3.01 TECHNIQUE

- A. Factual presentation.
- B. Correct exposure and focus.
 1. High resolution and sharpness.
 2. Maximum depth-of-field.
 3. Minimum distortion.

3.02 VIEWS REQUIRED

- A. Photograph from locations to adequately illustrate condition of construction and state of progress.
 1. At successive periods of photography, take at least one photograph from the same overall view as previously.
 2. Consult with the ENGINEER at each period of photography for instructions concerning views required.

3.03 ASSEMBLY OF PRINTS

- A. Each print shall be inserted in a separate, archival type, nonglare, photo protector.
- B. Provide one suitable size binder for each set of prints. Binders shall be provided in sufficient quantity to hold all photographs taken for the duration of the contract. Each binder shall be labeled by engraving on the front and spine with the project name.

3.04 DELIVERY OF PRINTS

- A. Deliver prints to the ENGINEER to accompany each Application for Payment.
- B. Distribution of prints as soon as processed is anticipated to be as follows:
 1. OWNER (one (1) set of prints and one (1) CD ROM with scanned photographs).
 2. ENGINEER (two (2) sets of prints for the construction file and two (2) CD ROMs of scanned photographs).
 3. Project Record File (one (1) set to be stored by CONTRACTOR on-site).
- C. No construction shall start until pre-construction photographs are completed and submitted to the ENGINEER.

END OF SECTION

SECTION 01400

CONTRACTOR QUALITY CONTROL

PART 1 - GENERAL

1.01 QUALITY CONTROL PLAN

- A. General: Furnish for approval by the ENGINEER, the CONTRACTOR Quality Control (CQC) Plan within 10 calendar days after award of contract. The plan shall identify personnel, procedures, instructions, records and forms to be used. The ENGINEER may refuse to allow construction to start until such time as an acceptable final plan is submitted.
- B. The Contractor Quality Control Plan: This plan shall include as a minimum, the following:
 - 1. A description of the quality control organization, including chart showing lines of authority and acknowledgment that the CQC staff shall report to the Project Manager or someone higher in the CONTRACTOR's organization.
 - 2. The name, qualifications, duties, responsibilities and authorities of each person assigned a CQC function.
 - 3. A copy of a statement signed by an authorized official of the CONTRACTOR's firm, which describes the responsibilities and delegates the authorities of the CQC System Manager.
 - 4. Procedures for scheduling and managing submittals, including those of subcontractors, offsite fabricators, suppliers and purchasing agents.
 - 5. Control testing procedures for each specific test. (Testing laboratories must be approved by the OWNER.)
 - 6. Reporting procedures including proposed reporting formats.
 - 7. Hazard Communication Program required under OSHA requirements.
- C. Acceptance of Plan: Acceptance of the plan by the OWNER and ENGINEER is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction.
- D. Notification of Changes: After acceptance of the CQC plan, notify the OWNER in writing of any proposed change. Proposed changes are subject to acceptance by the OWNER.

1.02 QUALITY CONTROL ORGANIZATION

- A. CQC System Manager: CQC System Manager shall be responsible for overall management of the CQC and have the authority to act in all CQC matters for the CONTRACTOR. This person shall demonstrate his/her ability to perform correctly the duties required of him/her to the satisfaction of the OWNER and shall be physically at the project site whenever work is in progress and will be in charge of the CONTRACTOR's Quality Control program for this project. All the CONTRACTOR's submittals for approval shall be reviewed and modified or corrected as needed by him/her or his/her authorized assistants and approved correct prior to forwarding of such submittals to the OWNER.
- B. Personnel: The personnel of the CQC staff shall be fully qualified by experience and technical training to perform their assigned responsibilities and shall be directly hired by and work for the CONTRACTOR.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01300. The CQC Organization shall be responsible for certifying that all submittals are in compliance with the contract requirements.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CONTROL

- A. Contractor Quality Control is the means by which the CONTRACTOR assures himself that his/her construction complies with the requirements of the Contract Drawings and Sections. The controls shall be adequate to cover all construction operations, including both onsite and offsite operations and will be keyed to the proposed construction sequence. The controls shall include at least three phases of inspection for all definitive features of work as follows:
 - 1. Preparatory Inspection: This shall be performed prior to beginning any definable feature of work. It shall include a review of contract requirements; a check to assure that all materials and/or equipment have been tested, submitted and approved; a check to assure that provisions have been made to provide required control testing; examination of the work area to ascertain that all preliminary work has been completed and a physical examination of materials, equipment and sample work to assure that they conform to approved shop drawings or submittal data and that all materials and/or equipment are on hand.
 - 2. Initial Inspection: This shall be performed as soon as a representative portion of the particular feature of work has been accomplished and shall include examination of the quality of workmanship and a review of control testing for compliance with contract requirements, use of defective or damaged materials, omissions, and dimensional requirements.
 - 3. Follow-up Inspection: These shall be performed daily to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. Such inspection shall be made a matter of record in the CQC documentation as required below. Final follow-up inspections shall be conducted and deficiencies corrected prior to the addition of new features of work.

3.02 TESTS

- A. Test Procedures: Perform tests specified or required to verify that control measures are adequate to provide a product which conforms to contract requirements. CONTRACTOR shall procure the services of an industry recognized testing laboratory per Section 01445. A list of tests which the CONTRACTOR understands he/she is to perform shall be furnished as a part of the CQC plan to the OWNER. The list shall give the test name, specification paragraph containing the test requirements and the personnel and laboratory responsible for each type of test. Perform the following activities and record and provide the following data:
 - 1. Verify that testing procedures comply with contract requirements.
 - 2. Verify that facilities and testing equipment are available and comply with testing standards.
 - 3. Verify that test instrument calibration data are checked against certified standards.
 - 4. Verify that recording forms, including all of the test documentation requirements, have been prepared.

3.03 COMPLETION INSPECTION

- A. At the completion of all work or any increment thereof established by a completion time stated in the paragraph entitled "Commencement, Prosecution and Completion of Work" or stated elsewhere in the Contract Sections, the CQC System Manager shall conduct a completion inspection of the work and develop a "punch list" of items which do not conform to the approved Drawings and Sections. Such a list shall be included in the CQC documentation and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or his/her staff shall make a second completion inspection to ascertain that all deficiencies have been corrected and so notify the OWNER. The completion inspection and any deficiency corrections required by this paragraph will be accomplished within the time stated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

3.04 DOCUMENTATION

- A. Maintain current records of quality control operations, activities and tests performed including the work of suppliers and subcontractors. These records shall be on an acceptable form (form attached) and indicate a description of trades working on the project, the numbers of personnel working, the weather conditions encountered, any delays encountered and acknowledgment of deficiencies noted along with the corrective actions taken on current and previous deficiencies. In addition, these records shall include factual evidence that required activities or tests have been performed, including but not limited to the following:
 - 1. Type and number of control activities and tests involved.
 - 2. Results of control activities or tests.
 - 3. Nature of defects, causes for rejection, etc.
 - 4. Proposed remedial action.
 - 5. Corrective actions taken.
- B. These records shall cover both conforming and defective or deficient features and shall include a statement that supplies and materials incorporated in the work comply with the requirements of the contract. Legible copies of these records shall be furnished to the OWNER daily.

3.05 NOTIFICATION OF NONCOMPLIANCE

- A. The OWNER or ENGINEER will notify the CONTRACTOR of any noncompliance with the foregoing requirements. After receipt of such notice, immediately take corrective action. Such notice, when delivered to the CONTRACTOR or his/her representative at the site of the work, shall be deemed sufficient for the purpose of notification. 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 claim for extension of time or for excess costs or damages by the CONTRACTOR.

QUALITY CONTROL DAILY REPORT

(CONTRACTOR)

REPORT NO. _____ CONTRACT NO. _____ DATE _____

LOCATION OF WORK: _____

DESCRIPTION: _____

WEATHER _____, RAINFALL _____ INCHES, TEMP: MIN _____ MAX _____

1. Work Performed Today by Prime Contractor (Include Plant and Labor Breakdown):

2. Work Performed Today by Subcontractors (Include Plant and Labor Breakdown):

3. List Specific Inspection Performed and Results of these Inspections. (Include Corrective Actions):

4. List Type and Location of Tests Performed and Results of these Tests:

5. Verbal Instructions Received from OWNER or ENGINEER on Construction Deficiencies or Re-testing Required:

6. Remarks: _____
7. CERTIFICATION: I certify that the above report is complete and correct and that I, or my authorized representative, have inspected the work performed this day by the CONTRACTOR and each subcontractor and have determined that all materials, equipment and workmanship are in strict compliance with the plans and specifications except as may be noted above.

Contractor's Designated Quality Control

END OF SECTION

SECTION 01410

TESTING AND INDEPENDENT TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. CONTRACTOR will employ and pay for the services of an Independent Testing Laboratory to perform all testing specifically indicated on the Contract Documents or specified in the Specifications. Costs for services provided by Independent Testing Laboratory are reimbursable as provided under Section 01150.
- B. OWNER or ENGINEER may also elect to have additional testing performed at OWNER's expense. When OWNER or ENGINEER elect to perform additional testing, CONTRACTOR shall coordinate with OWNER's or ENGINEER's personnel.
- C. Correction of any deficiencies revealed by testing performed by CONTRACTOR, OWNER, or ENGINEER shall be performed by CONTRACTOR at no additional cost to OWNER.

1.02 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C1077 – Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
 - 2. ASTM E329 – Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.

1.03 SUBMITTALS

- A. Certifications
 - 1. Certify that the CONTRACTOR is not associated with the independent testing laboratory proposed for use by the CONTRACTOR nor does the CONTRACTOR or officers of the CONTRACTOR's organization have a beneficial interest in the laboratory.
- B. Qualifications
 - 1. Independent Testing Laboratory
 - a. Name and address
 - b. Names and positions of principal officers and the name, position, and qualifications of the responsible registered professional engineer in charge.
 - c. Listing of technical services to be provided. Indicate external technical services to be provided by other organizations.
 - d. Names and qualifications of the supervising laboratory technicians.
 - e. Statement of conformance provided by evaluation authority defined in ASTM C1077. Provide report prepared by evaluation authority when requested by the ENGINEER.
 - f. Submit as required above for other organizations that will provide external technical services.

1.04 QUALITY ASSURANCE

- A. All field testing and inspection services and related laboratory tests required will be provided by the CONTRACTOR. The cost of such work will be paid for by the CONTRACTOR. Methods of testing will comply with the latest applicable ASTM methods.
- B. Independent testing laboratory shall meet the requirements of ASTM E329 and ASTM C1077 and be acceptable to the Engineer. Laboratories affiliated with the Contractor or in which the Contractor or officers of the Contractor's organization have a beneficial interest are not acceptable.
- C. Provide all field testing and inspection services and related laboratory tests. Methods of testing shall comply with the latest applicable ASTM methods.

1.05 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel, provide access to Work.
- 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 independent testing laboratory.
- D. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. The Engineer may require the CONTRACTOR to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the 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 and certification.
- E. Furnish incidental labor and facilities:
 - 1. To provide access to Work to be tested.
 - 2. To obtain and handle samples at the Project site or at the source of the product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. For storage and curing of test samples.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01445

PIPELINE TESTING AND CLEANING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals required and test and clean all new pipelines installed under this Contract as specified herein.

1.02 RELATED WORK

- A. Buried pipelines are included in Division 2.
- B. Above grade and exposed pipelines are included in Division 15.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. Furnish all necessary equipment and labor for cleaning and testing and chlorinating (if required) the pipelines. The procedures and methods shall be approved by the ENGINEER.
- B. Make any taps and furnish all necessary caps, plugs, etc, as required in conjunction with testing pipelines. Furnish a test pump, gauges and any other equipment required in conjunction with carrying out the hydrostatic tests.

3.02 CLEANING PIPELINES

- A. As pipe laying progresses and at the conclusion of the work thoroughly clean all new pipelines by flushing with water or other means to remove all dirt, stones, pieces of wood or other material which may have entered during the construction period. If, after this cleaning, obstructions remain, they shall be removed.

3.03 TESTING GRAVITY PIPELINES

- A. All gravity pipelines shall be tested as specified in the respective pipe material specification section.

3.04 TESTING PRESSURE PIPELINES

- A. All pressure pipelines shall be pressure and leakage tested as specified in the respective pipe material specification section.

END OF SECTION

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SECTION 01500

TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR will furnish, install and maintain temporary utilities required for construction, and remove on completion of Work.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with National Electric Code.
- B. Comply with Federal, State and local codes and regulations and with utility company requirements.
- C. Comply with Florida Department of Environmental Protection requirements.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY AND LIGHTING

- A. Arrange with utility company and OWNER to provide service required for power and lighting, and pay all costs for service and for power used in the construction, testing and trial operation prior to final acceptance of the work by the OWNER as stipulated by the ENGINEER.
- B. Provide adequate artificial lighting for all areas of work when natural light is not adequate for work, and for areas accessible to the public.

2.03 TEMPORARY HEAT AND VENTILATION

- A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate progress of the Work.
- B. Portable heaters will be standard approved units complete with controls.
- C. Pay all costs of installation, maintenance, operation and removal, and for fuel consumed.
- D. Provide connections to existing facilities; extend and supplement with temporary units as required to comply with requirements. Pay all costs of installation, maintenance, operation and removal.

2.04 TEMPORARY WATER

- A. Town of Longboat Key side of Longboat Pass - the OWNER will furnish and pay for the temporary water service for construction use on the Town of Longboat Key side of Longboat Pass. For water use on the TOWN's side of Longboat Pass, the contractor will be required to pay a refundable meter deposit and there will be no charge for the water used.
- B. Manatee County side of Longboat Pass - for water use on the Manatee County's side of Longboat Pass, the CONTRACTOR will be responsible for coordinating and direct payment for all water used and associated costs directly with Manatee County Utilities.
- C. Note that the rate at which the water is available may be insufficient for construction purposes. The CONTRACTOR shall provide adequate storage and pumping necessary to perform the work.
- D. The express approval of the OWNER shall be obtained before water is used. Waste of water shall be sufficient cause for withdrawing the privilege of unrestricted use on the Town of Longboat Key side. Hydrants shall only be operated under the supervision of the OWNER's personnel.

2.05 TEMPORARY SANITARY FACILITIES

- A. Provide sanitary facilities in compliance with laws and regulations.
- B. Service, clean and maintain facilities and enclosures.

PART 3 – EXECUTION

3.01 GENERAL

- A. Maintain and operate systems to assure continuous service.
- B. Modify and extend systems as work progress requires.

3.02 REMOVAL

- A. Completely remove temporary materials and equipment when their use is no longer required as determined by the ENGINEER.
- B. Clean and repair damage caused by temporary installations or use of temporary facilities.

END OF SECTION

SECTION 01505

MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.01 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 equipment required for the first month's operation.
 2. Install silt fences around perimeter of project site and at locations where surface drainage discharges to existing stormwater inlets.
 3. Install temporary construction power, wiring and lighting facilities.
 4. Establish a fire protection plan and safety program.
 5. Secure construction water supply.
 6. Provide on-site sanitary facilities and potable water facilities.
 7. Arrange for and erect CONTRACTOR'S work and storage yard and employee's parking facilities.
 8. Submit all required insurance certificates and bonds.
 9. Obtain all required permits.
 10. Post all OSHA, FDEP, Department of Labor, and all other required notices.
 11. Have CONTRACTOR'S project manager and/or superintendent at the job site full time.
 12. Submit a detailed progress schedule acceptable to the ENGINEER and OWNER.
 13. Submit cash flow in tabular and graphic form to the ENGINEER and OWNER.
 14. Submit a finalized Schedule of Values of the Work in the OWNER'S approved format.
 15. Submit a hurricane preparedness plan acceptable to the ENGINEER and the OWNER.
 16. Submit standardized traffic maintenance and control plans to OWNER.
 17. Submit a detailed construction sequence, disinfection and tie-in plan for approval by the ENGINEER
 18. Erect all required Project signs.

1.02 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 USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01570

TRAFFIC REGULATION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR shall be responsible for providing safe and expeditious movement of traffic through construction zone in accordance with all applicable laws and regulations. A construction zone is defined as the immediate areas of actual construction and all abutting areas which are used by the CONTRACTOR and which interfere with the driving, biking or walking public.
- B. Remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.
- C. Perform all work within rights-of-way and easements in strict accordance with the FDOT, Manatee County and Town of Longboat Key's Maintenance of Traffic Policy and other applicable statutory requirements to protect the public safety.
- D. The CONTRACTOR shall obtain the necessary permits from the Town of Longboat Key, Manatee County, and Coast Guard and provide notification(s) and Maintenance of Traffic (MOT) Plan(s) in accordance with the requirements set forth herein.

1.02 TRAFFIC CONTROL

- A. MOT Plans shall be per FDOT Index No. 602 and 603 which are applicable to work performed along or within two-lane, two-way travel lanes. It is not anticipated that specific site conditions will significantly compromise Index 600 of the FDOT Design Standards. If the CONTRACTOR'S MOT Plan(s) significantly compromises Index 600 of the FDOT Design Standards or cannot be accommodated through the typical applications of the FDOT Indexes, the CONTRACTOR will be required to submit a MOT Plan that is signed and sealed by a qualified, licensed Florida professional engineer.
- B. The necessary precautions shall include, but not be limited to, such items as proper construction warning signs, signals, lighting devices, markings, barricades, cones, sign boards, channelization, flagman, hand signaling devices, and any additional traffic control devices as needed or required by the CONTRACTOR's MOT plan(s). The CONTRACTOR shall be responsible for installation and maintenance of all devices and requirements for the duration of the construction period.
- C. The CONTRACTOR shall provide at least 15 working days notification of the necessity to close any portion of a roadway carrying vehicles or pedestrians so that the final approval of such closings can be obtained at least 48 hours in advance. Closure notification shall include a minimum of four (4) sign boards strategically placed to alert potential traffic of upcoming lane closures. Sign boards shall be in place a minimum of seven (7) calendar days in advance of road closure. Prior to roadway closures, alternate routes, approved by the OWNER, shall be established. The CONTRACTOR shall be responsible for all traffic control as in Paragraph A above.
- D. The CONTRACTOR shall also be responsible for notifying Police, Fire and Ambulance Departments, and County School Board whenever roads are impassable.

- E. The CONTRACTOR shall be responsible for removal, relocation, or replacement of any traffic control device in the construction area which exists as part of the normal pre-construction traffic control scheme. Any such actions shall be performed by the CONTRACTOR under the supervision, and in accordance with the Specifications, of the OWNER, unless otherwise specified.
- F. The CONTRACTOR shall immediately notify the OWNER of any vehicular or pedestrian safety or efficiency problems incurred as a result of the construction of the project.

1.03 MAINTENANCE OF TRAFFIC

- A. Until the permission to close the street is received in writing from the proper authority, 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 ways, erect wheel guards or fences, or take other measures satisfactory to the OWNER.
- B. Standardized detours around construction 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 periods when traffic is being detoured will be strictly controlled by the OWNER.
- C. The CONTRACTOR shall take precautions to prevent injury to the public due to open trenches. Night watchmen may be required where special hazards exist, or police protection provided for traffic while work is in progress. The CONTRACTOR shall be fully responsible for damage or injuries whether or not police protection has been provided.
- D. Notify the Fire Department, Police Department, EMS Department, Public Works Department, and School Board before closing any street or portion thereof. No closing shall be made without the approval of the OWNER or agency having jurisdiction. Notify said departments when the streets are again passable for emergency vehicles. Daily notification to these departments shall be made by the CONTRACTOR via fax identifying specifically new closures, continued closures and new openings. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, without special written permission from the Fire Department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access.
- E. The CONTRACTOR shall leave his night emergency telephone number or numbers with the police department, so that contact may be made easily at all times in case of barricade and flare trouble or other emergencies.
- F. Maintain postal service facilities in accordance with the requirements of the U.S. Postal Service. Move mailboxes to temporary locations designated by the U.S. Postal Service or provide and maintain portable temporary mailbox clusters. CONTRACTOR shall notify affected residents if mailboxes are to be relocated and to where. At the completion of the work in each area, replace mailboxes in their original location and in a condition satisfactory to the U.S. Postal Service and property owner and other service vehicles can identify each street or roadway so as not to delay their service. If temporary signs or markers are used, they shall meet the requirements of the OWNER and the Manual of Uniform Traffic Control Devices. Any signs or markers removed or relocated in the course of construction shall be replaced in the location and in equal or better condition that existed prior to construction.

- G. The CONTRACTOR shall be responsible for maintaining, relocation, or replacing, as necessary, all street or roadway identification signs or markers such that fire, police, emergency and other service vehicles can identify each street or roadway so as not to delay their service. If temporary signs or markers are used, they shall meet the requirements of the OWNER and the Manual of Uniform Traffic Control Devices. Any signs or markers removed or relocated in the course of construction shall be replaced in the location and in equal or better condition than existed prior to construction.

1.04 STREET CLOSURES

- A. The CONTRACTOR shall file tentative schedule of work not less than 10 days prior to first day of work under Contract.
- B. Closure shall mean the barricading of the street to all traffic. Part closure is the condition when a portion of normal traffic can be permitted although one or more traffic lanes will be out of service completely or for a portion of the time on an intermittent basis.
- C. Requests shall be made for specific locations, giving the correct name of the street and of the intersecting streets between which closure is sought. Permission may be limited to specific dates and hours, and such dates and hours must be closely observed.
- D. Streets that have been reopened after the stipulated period of closure shall not again be closed without obtaining new permission therefore.
- E. All manholes, valve boxes, or other similar structures left protruding above backfilled areas shall each be adequately barricaded and lighted.
- F. Excavated material and construction materials shall not be stockpiled in such manner as to unnecessarily hinder or confuse traffic adjacent to work where part closure is in effect.
- G. Requests and schedules are to be filed with the Town of Longboat Key.
- H. Crossing and Intersections: Do not isolate residences and place of business. Provide access to all residences and places of business whenever construction interferes with existing means of access. Maintain access at all times. If pavement is disturbed, a cold mix must be applied at the end of the day.
- I. Be responsible for notifying all residents of any road construction and limited access at least 72 hours in advance.

1.05 DETOURS

- A. The CONTRACTOR shall submit, for approval by the OWNER, standardized detour routing plans for use on the project. These plans shall include signage and barricades with dimensions for partial or complete closures for the following street types:
 - 1. Two lane undivided collector street.
- B. These approved standardized detours shall be referenced in the street-specific road closure requests.

1.06 FAILURE TO COMPLY

- A. Failure of the CONTRACTOR to comply with above or failure of the CONTRACTOR to make revisions, adjustments, or improvements directed by the OWNER will constitute violation of the Agreement. Immediate shut down and restoration of the site to allow traffic access to area may result. The CONTRACTOR shall hold the OWNER and the ENGINEER harmless from damages, loss of time, or expenses incurred, resulting from such shut down.

1.07 TRAFFIC CONTROL MEETINGS

- A. The OWNER and/or ENGINEER shall schedule and conduct meetings as required with the CONTRACTOR to attend to matters of traffic control and associated public convenience and safety during the course of the Work.
- B. The ENGINEER shall preside at the meetings and provide for keeping the minutes and distribution of minutes to the OWNER, the ENGINEER, the CONTRACTOR, and others. The purpose of the meetings will be for the CONTRACTOR presentation of traffic control plans and any revisions required during performance of the Work and to discuss related matters.

PART 2 – PRODUCTS

2.01 BARRIERS AND LIGHTS

- A. Barricades, flashers, lights, and "Danger", "Caution", "Street Closed", etc. signs shall meet the requirements of the Florida Department of Transportation and the Manual of Uniform Traffic Control Devices.
- B. Perform all Work with the requirements set forth by the Occupational Safety Health Administration.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01580

PROJECT IDENTIFICATION AND SIGNS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR shall furnish, install, and maintain a project identification sign for WORK on the north side (Manatee County) of Longboat Pass. No project sign shall be posted on the south side (Town of Longboat Key) of Longboat Pass.
- B. Remove sign on completion of construction.
- C. Allow no other signs to be displayed except for traffic control and safety.

1.02 PROJECT IDENTIFICATION SIGN

- A. One painted sign, of size of not less than 32 square feet area, with painted graphic content to include:
 - 1. Title of Project
 - 2. Name of OWNER
 - 3. Names and titles of authorities as directed by the OWNER
 - 4. Prime CONTRACTOR's name and the name and telephone number of the CONTRACTOR's contact person
- B. Graphic design, style of lettering, and colors: As designated by ENGINEER.
- C. Erect on the project site at a lighted location of high public visibility, adjacent to main entrance to construction site, as approved by the ENGINEER.

1.03 QUALITY ASSURANCE

- A. Sign Painter: Professional experience in type of work required.
- B. Finishes, Painting: Adequate to resist weathering and fading for scheduled construction period.

1.04 SUBMITTALS

- A. Submit shop drawings as specified in Section 01300.

PART 2 - PRODUCTS

2.01 SIGN MATERIALS

- A. Structure and Framing: Shall be new wood or metal, in sound condition structurally adequate to work and suitable for specified finish.
- B. Sign Surfaces: Marine grade plywood with medium density overlay, standard large sizes to minimize joints.

- C. Thickness: As required by standards to span framing members, to provide even, smooth surface without waves or buckles.
- D. Rough Hardware: Galvanized bolts, nuts and washers. Nailing will not be permitted.
- E. Paint: Exterior quality.

PART 3 - EXECUTION

3.01 PROJECT IDENTIFICATION SIGN

- A. Paint exposed surfaces of supports, framing and surface material; one coat of primer and one coat of exterior paint.
- B. Paint graphics in styles, sizes and colors selected.

3.02 MAINTENANCE

- A. Maintain signs and supports in a neat, clean condition; repair damages to structure, framing or sign.
- B. Relocate informational signs as required by progress of the work.

3.03 REMOVAL

- A. CONTRACTOR shall remove signs, framing, supports and foundations at completion of WORK on the north side (Manatee County) of Longboat Pass.

END OF SECTION

SECTION 01590

FIELD OFFICES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR shall furnish, install and maintain temporary field offices or temporary field office space for the CONTRACTOR's use during the entire construction period as described herein; and shall furnish, install and maintain storage and work sheds needed for construction. At completion of the Work, the CONTRACTOR shall remove field offices, sheds and contents.

1.02 SUBMITTALS

- A. Prior to the Pre-construction Conference, the CONTRACTOR shall submit to the ENGINEER a sketch of the temporary field offices and related facilities for consideration and approval of location, to avoid interference with the OWNER's activities on the adjacent site.

1.03 REQUIREMENTS FOR FACILITIES

- A. Construction shall:
 - 1. Be structurally sound, weathertight, with floors raised above ground.
 - 2. Have temperature transmission resistance: Compatible with occupancy and storage requirements.
 - 3. At CONTRACTOR's option, portable or mobile buildings may be used.
 - a. Mobile trailers or buildings, when used, shall be modified for office use.
 - b. Mobile trailers or buildings shall not be used for living quarters.
 - 4. At CONTRACTOR's option, the CONTRACTOR may locate and coordinate the contractor's field office space (which may, or may not, be a trailer) in nearby retail space.
- B. CONTRACTOR's Office and Facilities:
 - 1. Size: As required for general use.
 - 2. Lighting: 50 foot candles at desktop height.
 - 3. Automatic heating and mechanical cooling (air conditioning) equipment sufficient to maintain comfort conditions.
 - 4. Telephone Lines:
 - a. One direct line for facsimile
 - b. One direct line for telephone
 - 5. Facsimile machine (plain paper type).
 - 6. Racks and files for Project Record Documents.
 - 7. One 10-inch outdoors type thermometer.
 - 8. One outdoors rain gauge.
 - 9. Xerographic machine with reduction, enlargement, and ten sets capabilities.
- C. The Contractor shall make all provisions and pay all installations and other costs, including maintenance and supplies for the CONTRACTOR's field office in order to provide telephone, power service, exterior lights, xerographic machine and facsimile machine at the project site.

- D. The CONTRACTOR shall provide a fully operational office for the ENGINEER's Resident Project Representative (RPR) within 30 days after insurance of the Notice to Proceed.

Requirements for RPR's Office in CONTRACTOR's field office:

1. Office Size: 10 foot by 12-foot minimum divided into an office and bathroom.
2. Ceiling height shall be 8-feet.
3. Two (2) exterior entry doors to have a keyed locksets keyed alike.
4. Lighting: 50-foot candles at desktop height.
5. Automatic heating and mechanical cooling (air conditioning) equipment sufficient to maintain comfort conditions.
6. One 5 foot by 2-1/2 foot desk with chair.
7. One 6 foot by 2-1/2 foot folding table with 2 chairs.
8. One 6 foot high by 3-foot wide metal storage cabinet with key.
9. Two 4 foot high by 3-foot wide bookcase.
10. One 4-drawer file cabinet.
11. Wireless high speed internet connection.
12. Bathroom with flush toilet, sink and mirror. Bathroom door shall be equipped with a lock.
13. Each room shall be provided with two (2) duplex convenience electrical outlets.
14. Two wastebaskets.
15. One wall mounted first aid kit.
16. Two smoke detectors with batteries.
17. One dry erase board 36"x60", markers and eraser.
18. Cross-cut shredder with basket.
19. Fire extinguisher, UL rated, Class A complying with local codes.
20. Two 8-outlet surge protectors with 1800-joule energy rating.
21. Extension power cords for connection of equipment herein.
22. Hewlett Packard All-in-One color inkjet scan, fax, copier, printer with multi sheet scan and fax input, minimum 600 dpi B&W resolution, able to input and output letter and legal size paper, or equal.

1.04 PARKING

- A. The CONTRACTOR shall provide a temporary parking area at the field office if available.
- B. The CONTRACTOR shall not allow vehicle parking by employees or subcontractors on public rights-of-way.

PART 2 – PRODUCTS

2.01 MATERIALS, EQUIPMENT, FURNISHINGS

- A. Materials, equipment and furnishings may be new or used, but must be in good condition, serviceable, adequate for the required purpose, and must comply with all applicable LAWS AND REGULATIONS.

PART 3 – EXECUTION

3.01 PREPARATION

- A. The CONTRACTOR shall fill and grade sites for temporary structures to provide adequate surface drainage.

3.02 INSTALLATION

- A. The CONTRACTOR shall construct temporary field offices on proper foundations; provide connections for utility services; secure portable or mobile buildings when used; provide steps and landings at entrance doors; provide roofs over landings and entrance doors, and provide hurricane or high wind tie-downs embedded in subsurface concrete pilasters, thereby meeting or exceeding applicable LAWS AND REGULATIONS.
- B. The CONTRACTOR shall mount a thermometer and rain gauge at convenient outside locations, not in direct sunlight.

3.03 MAINTENANCE AND CLEANING

- A. The CONTRACTOR shall provide periodic maintenance and cleaning for temporary structures, furnishings, equipment and services at not less than one (1) week intervals.

3.04 REMOVAL

- A. The CONTRACTOR shall remove temporary field offices, contents and services at a time when no longer needed and as approved by the OWNER.
- B. The CONTRACTOR shall remove foundations and debris and grade site to required elevations and clean the areas.

3.05 LOCATION OF FIELD OFFICES

- A. The CONTRACTOR shall provide a layout of all temporary field offices to the OWNER for consideration and approval prior to the Pre-construction Conference.

END OF SECTION

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SECTION 01600

DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. This Section specifies the general requirements for the delivery handling, storage and protection for all items required in the construction of the work. Specific requirements, if any, are specified with the related item.

1.02 TRANSPORTATION AND DELIVERY

- A. Transport and handle items in accordance with manufacturer's instructions.
- B. Schedule delivery to reduce long term on-site storage prior to installation and/or operation. Under no circumstances will equipment be delivered to the site more than one month prior to installation without written authorization from the ENGINEER.
- C. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.
- D. Deliver products to the site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting and installing.
- E. All items delivered to the site will be unloaded and placed in a manner which will not hamper the CONTRACTOR's normal construction operation or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic.
- F. Provide necessary equipment and personnel to unload all items delivered to the site.
- G. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by the OWNER, perform inspection in the presence of the ENGINEER/OWNER. Notify ENGINEER verbally, and in writing, of any problems.

1.03 STORAGE AND PROTECTION

- A. Store and protect products in accordance with the manufacturer's instructions, with seals and labels intact and legible. Storage instruction will be studied by the CONTRACTOR and reviewed with the ENGINEER by him. Instruction will be carefully followed and a written record of this kept by the CONTRACTOR. Arrange storage to permit access for inspection.
- B. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- C. Cement and lime will be stored under a roof and off the ground and will be kept completely dry at all times. All structural, miscellaneous and reinforcing steel will be stored off the ground or otherwise to prevent accumulations of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Beams will be stored with the webs vertical. Precast

concrete will be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block and similar masonry products will be handled and stored in a manner to reduce breakage, cracking and spalling to a minimum.

- D. Materials shall be stored on-site so as to not affect continuous operation of the existing pump station. Coordinate with the ENGINEER, Town Representatives, and other CONTRACTOR's prior to delivery of materials to the site.

1.04 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.
- D. Lawns and Landscaping.
 - 1. Prohibit traffic of any kind across planted lawn and landscaped areas.

1.05 SPECIAL TOOLS

- A. If required, manufacturers of equipment and machinery will furnish any special tools (including grease guns or other lubricating devices) required for normal adjustment, operations and maintenance, together with instructions for their use. The CONTRACTOR will preserve and deliver to the OWNER at the Town of Longboat Key Public Works Department offices with receipt, these tools and instructions in good order ten (10) days prior to facility startup.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01610

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Material and equipment incorporated into the Work:
 - 1. Conform to applicable specifications and standards.
 - 2. Comply with size, make, type and quality specified, or as specifically approved in writing by the ENGINEER.
 - 3. Manufactured and Fabricated Products
 - a. Design, fabricate and assemble in accord with the best engineering and shop practices.
 - b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
 - c. Two or more items of the same kind will be identical, by the same manufacturer.
 - d. Products will be suitable for service conditions.
 - e. Equipment capacities, sizes and dimensions shown or specified will be adhered to unless variations are specifically approved in writing.
 - 4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.02 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related requirements:
 - 1. Conditions of the Contract
 - 2. Summary of Work is included in Section 01010.
 - 3. Special Project Procedures are included in Section 01100.
 - 4. Submittals are included in Section 01300.
 - 5. Cleaning is included in Section 01710.
 - 6. Operating and Maintenance Data is included in Section 01730.
 - 7. Warranties and Bonds are included in Section 01740.

1.03 APPROVAL OF MATERIALS

- A. Only new materials and equipment will be incorporated in the work. All materials and equipment furnished by the CONTRACTOR will be subject to the inspection and approval of the ENGINEER. No material will be delivered to the work without prior approval of the ENGINEER.
- B. Within 30 days after the effective date of the Agreement, the CONTRACTOR will submit to the ENGINEER, data relating to materials and equipment he/she proposes to furnish for the work. Such data will be in sufficient detail to enable the ENGINEER to identify the particular product and to form an opinion as to its conformity to the specifications. The data will comply with Section 01300.
- C. Facilities and labor for handling and inspection of all materials and equipment will be furnished by the CONTRACTOR. If the ENGINEER requires, either prior to beginning or during the progress of the work, the CONTRACTOR will submit samples of materials for such special tests as may be necessary to demonstrate that they conform to the specifications. Such samples will be furnished, stored, packed, and shipped as directed at the CONTRACTOR's expense. Except as otherwise

noted, the CONTRACTOR will make arrangements for and pay for the tests.

- D. The CONTRACTOR will submit data and samples sufficiently early to permit consideration and approval before materials are necessary for incorporation in the work. Any delay of approval resulting from the CONTRACTOR's failure to submit samples or data promptly will not be used as a basis of claim against the OWNER or the ENGINEER.
- E. In order to demonstrate the proficiency of workmen or to facilitate the choice among several textures, types, finishes and surfaces, the CONTRACTOR will provide such samples of workmanship or finish as may be required.
- F. The materials and equipment used on the work will correspond to the approved samples or other data.

1.04 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

- A. When Contract Documents require that installation of work will comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including 6 copies to the ENGINEER.
 - 1. Maintain one set of complete instructions at the job site during installation and until completion.
- B. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
 - 1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with ENGINEER for further instructions.
 - 2. Do not proceed with work without clear instructions.
- C. Perform work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.05 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of Products in accord with construction schedules, coordinate to avoid conflict with work and conditions at the site.
 - 1. Deliver Products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
 - 2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that Products are properly protected and undamaged.
- B. Provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.

1.06 STORAGE AND PROTECTION

- A. The CONTRACTOR will furnish a covered, weather-protected storage structure providing a clean, dry, noncorrosive environment for all mechanical equipment, valves, architectural items, electrical and instrumentation equipment and special equipment to be incorporated into this project. Storage of equipment will be in strict accordance with the "instructions for storage" of each equipment supplier and manufacturer including connection of heaters, placing of storage lubricants in

equipment, etc. The CONTRACTOR will furnish a copy of the manufacturer's instructions for storage to the ENGINEER prior to storage of all equipment and materials. Corroded, damaged or deteriorated equipment and parts will be replaced before acceptance of the project. Equipment and materials not properly stored will not be included in a payment estimate.

- B. Store Products in accordance with manufacturer's instructions, with seals and labels intact and legible.
 - 1. Store products subject to damage by the elements in weather tight enclosures.
 - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
 - 3. Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.
 - 4. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
- C. All materials and equipment to be incorporated in the work will be handled and stored by the CONTRACTOR before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting and any injury, theft or damage of any kind whatsoever to the material or equipment.
- D. Cement, sand and lime will be stored under a roof and off the ground and will be kept completely dry at all times. All structural and miscellaneous steel and reinforcing steel will be stored off the ground or otherwise to prevent accumulations of dirt or grease and in a position to prevent accumulations of standing water and to minimize rusting. Beams will be stored with the webs vertical. Precast concrete beams will be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block and similar masonry products will be handled and stored in a manner to reduce breakage, chipping, cracking and spalling to a minimum.
- E. All materials which, in the opinion of the ENGINEER, have become so damaged as to be unfit for the use intended or specified will be promptly removed from the site of the work and the CONTRACTOR will receive no compensation for the damaged material or its removal.
- F. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored Products to assure that Products are maintained under specified conditions and free from damage or deterioration.
- G. Protection After Installation
 - 1. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove covering when no longer needed.
- H. The CONTRACTOR will be responsible for all material, equipment and supplies sold and delivered to the OWNER under this Contract until final inspection of the work and acceptance thereof by the OWNER. In the event any such material, equipment, and supplies are lost, stolen, damaged, or destroyed prior to final inspection and acceptance, the CONTRACTOR will replace same without additional cost to the OWNER.
- I. Should the CONTRACTOR fail to take proper action on storage and handling of equipment supplied under this Contract within seven days after written notice to do so has been given, the OWNER retains the right to correct all deficiencies noted in previously transmitted written notice and deduct the cost associated with these corrections from the CONTRACTOR's Contract. These

costs may be comprised of expenditures for labor, equipment usage, administrative, clerical, engineering and any other costs associated with making the necessary corrections.

1.07 WARRANTY

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01665

STARTUP

PART 1 - GENERAL

1.01 GENERAL

- A. Prior to requesting issuance of the Certificate of Substantial Completion, startup will be completed as specified herein.
- B. Startup of the new water main, venturi meter and pressure reducing station and appurtenances will require connections to the existing water main.
- C. All equipment shall be tested and approved in the presence of the OWNER and ENGINEER prior to placing the venturi meter and pressure reducing station into operation.
- D. All lubricants, fuel and power necessary for initial operation and tests shall be furnished by the CONTRACTOR.
- E. In addition to furnishing, delivering, installing, and testing equipment, the CONTRACTOR shall provide the services of competent manufacturing representatives for the periods indicated in other sections of these Specifications. Such representative shall assist the OWNER's personnel in startup by instructing the operating personnel of the OWNER in the maintenance and operation of the equipment, conducting tests, and making recommendations for producing the most efficient results. These services shall be made during the initial operation of the completed pressure reducing station and be over and above any services necessary during erection or to correct defective materials or workmanship during the guarantee period. These representatives shall be specially trained and qualified for installation, adjustment, startup, and testing work and shall not be sales representatives only. The cost of such representation, including subsistence and travel, shall be included in the bid under this contract.

PART 2 - MATERIALS (NOT USED)

PART 3 - EXECUTION

3.01 PRELIMINARY MATTERS

- A. General Requirements:
 - 1. Successfully execute the step-by-step procedure of startup and performance demonstration specified hereinafter.
 - 2. The startup and performance demonstration shall be successfully executed prior to substantial completion and acceptance by the OWNER.
 - 3. Field acceptance tests shall be witnessed by the OWNER and ENGINEER. At least 30 calendar days prior to scheduled testing, CONTRACTOR shall submit details of all test procedures to the 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 and 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 takes over the operation thereof.

B. Preparation for Startup:

1. Upon completion of the new water main and venturi meter, all pipe lines shall be filled and flushed with water and hydraulically checked for leaks, cracks, and defects.
2. All mechanical and electrical equipment shall be checked to ensure that it is in good working order and properly connected. Preliminary run-ins of the various equipment shall be made. All systems shall be purged as required.
3. All instruments and controls shall be calibrated through their full range. Any other adjustments required for proper operation of all instrumentation and control equipment shall be made.
4. The CONTRACTOR shall perform all other tasks needed for preparing and conditioning the treatment facility for proper operation.
5. No testing or equipment operation shall take place until it has been verified by the ENGINEER that all specified safety equipment has been installed and is in good working order.
6. No testing or equipment operation shall take place until it has been verified by the ENGINEER that all lubricants, tools, maintenance equipment, spare parts, and approved equipment operation and maintenance data manuals have been furnished as specified.

C. Submit startup plans to the ENGINEER 10 days prior to the startup date.

3.02 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 piping, and equipment shall be tested in the field in the presence of the 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

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 and American Water Works Association Standard for Steel Pipes 6-inch and larger, AWWA C200, except as herein modified or as specified in Sections 02616 and 02622.
2. After completion of all work or any portion thereof and before final acceptance, a hydrostatic and leakage test shall be conducted. Water used in 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 existing valves to be operated without the presence of a duly qualified representative of the OWNER.
3. Hydrostatic tests of the completed pipelines shall be performed in accordance with the applicable piping specifications.
4. The test 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, 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, and accessories shall be removed from the line and replaced by the CONTRACTOR.
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 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 ENGINEER and a representative of the OWNER. 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 ENGINEER 48 hours advance notice of the time when the installation is ready for hydrostatic and leakage tests.

3.03 INITIAL OPERATION TESTS

- A. Upon completion of all structural, installation and adjustment of equipment, and pipe work, in a manner satisfactory to the ENGINEER and in compliance with the completion dates. The CONTRACTOR shall designate a way for initial testing of the facilities. Prior to such completion date, the CONTRACTOR shall give the OWNER 10 days notice thereof in writing and the OWNER will then appoint the personnel who will assist in the testing, and on the test day designated, the CONTRACTOR shall make the initial test to determine performance using the personnel designated by the OWNER and such other personnel of his own as is specified or as he deems necessary to complete the tests. The field tests required will be as described in the applicable Sections of these Specifications.
- B. The initial tests shall be limited to a period of 24 hours duration, or shorter if approved by the OWNER/ENGINEER, and during this time the performance of all equipment shall be tested and demonstrated by the CONTRACTOR. If the demonstration and tests indicate satisfactory performance in the operation of the equipment, the CONTRACTOR will then be given a ten day notice by the ENGINEER to make a final guarantee test of the equipment under normal operation. During initial tests and the ten day period between the initial tests and the final test, the CONTRACTOR's personnel shall supervise the operation of the equipment and assist and train the OWNER's operating personnel in their duties. Experts on equipment installation and operation as specified or necessary as well as complete, written detailed erection, operation and maintenance instructions shall be furnished by the CONTRACTOR to insure proper training and instruction of the OWNER's personnel.

- C. All performance tests and inspections shall be conducted during the normal work week of Monday through Friday, unless otherwise specified.
- D. 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 takes over the operation thereof.
- E. The final guarantee tests shall be conducted in accordance with procedures and shall be a prerequisite of substantial completion and acceptance, and shall be made at the conclusion of the ten day period of operation and training. These tests shall be made under normal operating conditions under the supervision of the CONTRACTOR's personnel. This test is for the purpose of demonstrating that performance and efficiency guarantees of the equipment and other requirements in compliance with these Specifications have been met, that the operation of all equipment is coordinated, and that all controls operate satisfactorily in accordance with the equipment installed.
- F. In the event the initial or final guarantee testing and demonstration of equipment and controls does not meet the guarantee conditions or is not demonstrated to the satisfaction of the ENGINEER, the CONTRACTOR shall, at his own expense, make such changes and adjustments in the equipment which is deemed necessary and shall conduct further tests until full satisfaction is received thereof.
- G. The OWNER will pay the salaries of the personnel selected by the OWNER for operation of the new booster station. Payment of all other salaries, public utility services, and operating expenses shall be borne by the CONTRACTOR for the test period and any additional test period required.
- H. Startup with water and the final guarantee testing and demonstration shall not begin until all facilities and equipment have been tested as specified and ready for operation. The OWNER must receive spare parts, safety equipment, tools and maintenance equipment, lubricants, approved operation and maintenance data, and the specified operation and maintenance instruction prior to the startup. All valve tagging as specified in Section 15100 shall also be completed prior to startup.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR will comply with requirements stated in General Conditions and in Specifications for administrative procedures in closing out the Work.

1.02 SUBSTANTIAL COMPLETION

- A. When CONTRACTOR considers the Work is substantially complete as defined in Section 01010, he will submit to the ENGINEER:
 - 1. A written notice that the Work, or designated portion thereof, is substantially complete.
 - 2. A list of items to be completed or corrected.
- B. Within ten calendar days after receipt of such notice, the ENGINEER/OWNER will make an inspection to determine the status of completion.
- C. Should the ENGINEER determine that the Work is not substantially complete:
 - 1. The ENGINEER will promptly notify the CONTRACTOR in writing, giving the reasons therefore.
 - 2. CONTRACTOR will remedy the deficiencies in the Work, and send a second written notice of substantial completion to the ENGINEER.
 - 3. The ENGINEER will reinspect the Work.
- D. When the ENGINEER finds that the Work is substantially complete, he will:
 - 1. Prepare and deliver to OWNER a tentative Certificate of Substantial Completion on NSPE Form 1910-8-D, with a tentative list of items to be completed or corrected before final payment.
 - 2. After consideration of any objections made by the OWNER as provided in Conditions of the Contract, and when the ENGINEER considers the Work substantially complete, he will execute and deliver to the OWNER and the CONTRACTOR a definite Certificate of Substantial Completion with a revised tentative list of items to be completed or corrected.

1.03 FINAL INSPECTION

- A. When CONTRACTOR considers the Work is complete, he will submit written certification that:
 - 1. Contract Documents have been reviewed.
 - 2. Work has been inspected for compliance with Contract Documents.
 - 3. Work has been completed in accordance with Contract Documents.
 - 4. Equipment and systems have been tested in the presence of the OWNER's representative and are operational.
 - 5. Work is completed and ready for final inspection.
- B. The ENGINEER will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should the ENGINEER consider that the Work is incomplete or defective:
 - 1. The ENGINEER will promptly notify the CONTRACTOR in writing, listing the incomplete or defective work.

2. CONTRACTOR will take immediate steps to remedy the stated deficiencies, and send a second written certification to the ENGINEER that the Work is complete.
 3. The ENGINEER will reinspect the Work.
- D. When the ENGINEER finds that the Work is acceptable under the Contract Documents, he will request the CONTRACTOR to make closeout submittals.

1.04 REINSPECTION FEES

- A. Should the ENGINEER or OWNER perform reinspections due to failure of the Work to comply with the claims of status of completion made by the CONTRACTOR:
1. OWNER will deduct the amount of such compensation from the final payment to the CONTRACTOR.

1.05 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ENGINEER

- A. Evidence of compliance with requirements of governing authorities.
- B. Project Record Documents: Requirements of Section 01720.
- C. Operating and Maintenance Data, Instructions to OWNER'S Personnel: Requirements of Section 01730.
- D. Warranties: General Conditions and Section 01740.
- E. Spare Parts and Maintenance Materials.
- F. Evidence of Payment and Release of Liens: Requirements of General and Supplementary Conditions, on form entitled Contractor's Final Affidavit provided in these documents.
- G. Certificate of Insurance for Products and Completed Operations: Requirements of General Conditions.
- H. CONTRACTOR's Final Affidavit will be signed and submitted to the ENGINEER (see attached sheet, included in these documents.)
- I. Executed warranty included in these documents.

1.06 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the ENGINEER.
- B. Statement will reflect all adjustments to the Contractor Sum:
1. The original Contract Sum.
 2. Additions and deductions resulting from:
 - a. Previous Change Orders.
 - b. Unit Prices.
 - c. Deductions for uncorrected Work.
 - d. Deductions for liquidated damages.
 - e. Deductions for reinspection payments.
 - f. Other adjustments.
 - g. Inspection overtime.
 - h. Excessive shop drawing review cost by the ENGINEER.

3. Total Contract Sum, as adjusted.
4. Previous payments.
5. Sum remaining due.

- C. The ENGINEER will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.07 FINAL APPLICATION FOR PAYMENT

- A. The CONTRACTOR will submit the final Application for Payment in accordance with procedures and requirements stated in the General Conditions.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

- A. The CONTRACTOR will furnish all necessary tools and labor required to allow ENGINEER and OWNER to verify the status of completion

END OF SECTION

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SECTION 01710

CLEANING

PART 1 - GENERAL

1.01 SCOPE OF WORK

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

1.02 RELATED WORK

- A. Standard General Conditions of the Construction Contract are included in Section 00700.
- B. Each Section: Cleaning for specific products or work.

1.03 DISPOSAL AND CLEANING

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations and anti-pollution laws.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION

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

3.02 DUST CONTROL

- A. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.

3.03 FINAL CLEANING

- A. Employ skilled workmen for final cleaning.
- B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels and other foreign materials from sight-exposed interior and exterior surfaces.
- C. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
- D. Prior to final completion, conduct an inspection of sight-exposed interior and exterior surfaces and all work areas, to verify that the entire work is clean.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR shall maintain at the site for the OWNER one record copy of:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.
 - 5. ENGINEER's Field Orders or written instructions.
 - 6. Approved Shop Drawings, Working Drawings and Samples.
 - 7. Field Test records.
 - 8. Construction photographs.
 - 9. Detailed Progress Schedule.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents and samples in CONTRACTOR's field office apart from documents used for construction.
 - 1. Provide files and racks for storage of documents.
 - 2. Provide locked cabinet or secure storage space for storage of samples.
- B. File documents and samples in accordance with CSI format.
- C. Maintain documents in a clean, dry, legible, condition and in good order. Do not use record documents for construction purposes.
- D. Make documents and samples available at all times for inspection by the ENGINEER/OWNER.
- E. As a prerequisite for monthly progress payments, the CONTRACTOR is to provide the currently updated "record documents" (Red Lines) for review by the ENGINEER and OWNER.

1.03 MARKING DEVICES

- A. Provide felt tip marking pens for recording information in the color code designated by the ENGINEER.

1.04 RECORDING

- A. Label each document "PROJECT RECORD" with month and year in neat large printed letters.
- B. Record information concurrently with construction progress.
 - 1. Do not conceal any work until required information is recorded.
- C. Drawings; Legibly mark to record actual construction:
 - 1. Elevations of various structure elements in relation to grade (including tank slab elevation, top of tank, etc.).

2. All underground piping with elevations and dimensions. Changes to piping location. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Actual installed pipe material, class, etc.
 3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 4. Field changes of dimension and detail.
 5. Changes made by Field Order or by Change Order.
 6. Details not on original contract drawings.
 7. Equipment and piping relocations.
- D. Specifications and Addenda; provide one complete set and legibly mark each Section to record:
1. Manufacturer, trade name, catalog number, and Supplier of each Product and item of equipment actually installed.
 2. Changes made by Field Order or by Change Order.
- E. Shop Drawings (after final review):
1. One set of record drawings for each process equipment and piping system in conformance with Section 01300.

1.05 SUBMITTAL

- A. Prior to final completion, deliver record drawings (and AutoCAD files, as required) of the Record Documents to the ENGINEER for the OWNER. Also, include the Red Line markup and additional field notes suitable to confirm actual installed location of pipe.
- B. Accompany submittal with transmittal letter in duplicate, containing: one set of specifications and Addenda, and Shop Drawings in accordance with Paragraph 1.04 D and E of this Section, prior to final completion.
- C. Accompany submittal with transmittal letter in duplicate, containing:
1. Date.
 2. Project title and number.
 3. CONTRACTOR'S name and address.
 4. Title and number of each Record Document.
 5. Signature of CONTRACTOR or his authorized representative.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. 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 the Specifications.
- B. Instruct the 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.

1.02 QUALITY ASSURANCE

- A. Preparation of data shall be done by personnel:
 - 1. Trained and experienced in maintenance and operation of described products.
 - 2. Familiar with requirements of this section.
 - 3. Skilled as technical writer to the extent required to communicate essential data.
 - 4. Skilled as draftsman competent to prepare required drawings.

1.03 FORM OF SUBMITTALS

- A. Prepare data in hardcopy and digital form of an instructional manual for use by OWNER's personnel.
- B. Format:
 - 1. Size: 8-1/2 inches x 11 inches.
 - 2. Paper: 20 pound minimum white, for typed pages.
 - 3. Text: MANUFACTURER's printed data, or neatly typewritten.
 - 4. Drawings:
 - a. Provide reinforced punched binder tabs, bind in with text.
 - b. Reduce larger drawings and fold to size of text pages but not larger than 14 in x 17 in.
 - 5. Provide fly-leaf for each separate product or each piece of operating equipment.
 - a. Provide typed description of product and major component parts of equipment.
 - b. Provide indexed tabs.
 - 6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS." List:
 - a. Title of Project.
 - b. Identity of separate structures as applicable.
 - c. Identity of general subject matter covered in the manual.
 - 7. Binders:
 - a. Commercial quality three-post binders with durable and cleanable plastic covers.
 - b. Maximum post width: Expandability 3 to 5 inches.
 - c. When multiple binders are used, correlate the data into related consistent groupings.

C. Electronic Format

1. Electronic copy in portable document format (pdf) of all items listed in 1.03.B.
2. Provide on compact-disc (CD)-Rom, clearly labeled as indicated in 1.03.B.6.

1.04 CONTENT OF MANUAL

A. Neatly typewritten table of contents for each volume, arranged in systematic order.

1. CONTRACTOR, name of responsible principal, address and telephone number.
2. A list of each product required to be included, indexed to content of the volume.
3. List, with each product, name, address and telephone number of:
 - a. Subcontractor 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 the Contract Documents.

B. Product Data:

1. Include only those sheets which are pertinent to the specific product.
2. Annotate each sheet to:
 - a. Clearly identify specific product or part installed.
 - b. Clearly identify data applicable to installation.
 - c. Delete references to inapplicable information.

C. Drawings:

1. Supplement product data with drawings as necessary to clearly illustrate:
 - a. Relations of component parts of equipment and systems.
 - b. Control and flow diagrams.
2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
3. Do not use Project Record Documents as maintenance 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 the OWNER's personnel, give:
 - a. Proper procedures in event of failure.
 - b. Instances which might affect validity of warranties or bonds.

1.05 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. Startup, 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.
 - 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 controls MANUFACTURER.
 - 7. Original MANUFACTURER's parts list, illustrations, assembly drawings and diagrams required for maintenance.
 - 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 the 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, 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 the Specifications.

- F. Acceptance of the Operation and Maintenance (O&M) Manual will also require successful completion of the attached O&M review checklist.

1.06 SUBMITTAL SCHEDULE

- A. Submit three copies of preliminary draft of proposed formats and outlines of contents of Operation and Maintenance Manuals within sixty 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 sixty days of shop drawing approval for each piece of equipment. No later than sixty days following the ENGINEER's approval of the last shop drawing for material to be included in the Operation and Maintenance Manuals, submit three bound volumes of all completed data for review. One copy will be returned with comments to be incorporated into final copies.
- C. Submit specified number of copies of approved data in final form directly to the offices of the ENGINEER, Camp Dresser & McKee Inc., within thirty calendar days of product shipment to the project site and preferably within thirty days after the reviewed copy is received. Final approved copies shall be delivered to the ENGINEER prior to OWNER's personnel instruction, startup and acceptance by the OWNER.
- D. Submit five copies of addendum to the Operating and Maintenance Manual as applicable and certificates as specified in paragraph 1.03 of Section 01100 within thirty days after plant startup test and acceptance test.

1.07 INSTRUCTION OF OWNER PERSONNEL

- A. Should the OWNER request, the CONTRACTOR will provide operating and maintenance personnel in operation, adjustment, and maintenance of products, equipment, and systems. The operating and maintenance manuals shall constitute the basis of instruction.
- B. 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 USED)

PART 3 - EXECUTION (NOT USED)

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?

OPERATIONS AND MAINTENANCE DATA

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?

O&M REVIEW CHECKLIST
(continued)

COMMENTS

Fully Approved: _____

The following points of rejection require resubmittal by the Contractor:

Reviewed By: _____

LEGEND

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

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

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 client (and CDM) satisfied with the training session? _____

Comments:

END OF SECTION

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SECTION 01740

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 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.

1.02 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 01700 Contract 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 02 through 16.

1.03 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 16 for specific content requirements, and particular requirements for submittal of special warranties.

1.04 WARRANTY REQUIREMENT

- A. Related Damages and Losses: When correcting warranted Work that has failed, CONTRACTOR will 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, at no additional compensation.
- 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

will 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 will not limit the duties, obligations, rights and remedies otherwise available under the law, nor will 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.
- H. If the Owner reasonably determines that the Contractor has breached any of the warranties provided herein, then the Contractor will perform the necessary work to comply with its warranties and will pay to the Owner its reasonable cost to investigate and then identify the breach of warranty claim.

1.05 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.
- B. Format:
 - 1. Size 8 ½ -inches x 11-inches, punch sheets for standard three post binder.
 - a. Sample form of warranty is included in these Contract Documents.
 - b. 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.

1.06 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 USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 02050

REMOVAL, MODIFICATION, AND ABANDONMENT OF PIPELINES

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and demolish, abandon, modify, remove and dispose of work shown on the Drawings and as specified herein.
- B. Demolition, modifications and removals which may be specified under other Sections shall conform to requirements of this Section.
- C. Blasting and the use of explosives will not be permitted for any demolition work.

1.02 SUBMITTALS

- A. Submit the proposed methods for demolition, abandonment, modification, removal, and disposal prior to the start of work. Include in the schedule the coordination of shutoff, capping and continuation of utility service as required.
- B. Furnish a detailed sequence of demolition and removal work to ensure that sewer service is not interrupted.
- C. Actual work shall not begin until the ENGINEER has inspected and approved the modifications and authorized commencement of the demolition work in writing.

1.03 RULES AND REGULATIONS

- A. The Building Code of the State of Florida and Town of Longboat Key shall control the demolition, modification etc.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

- A. Protection
 - 1. Execute the demolition and removal work to prevent damage or injury to structures, occupants thereof and adjacent features which might result from falling debris or other causes, and so as not to interfere with the use, and free and safe passage to and from adjacent structures.
 - 2. Closing or obstructing of roadways, sidewalks and passageways adjacent to the work by the placement or storage of materials will not be permitted and all operations shall be conducted with a minimum interference to traffic on these ways.
 - 3. Erect and maintain barriers, lights, sidewalk sheds and other required protective devices.

B. Scheduling

1. Carry out operations so as to avoid interference with operations and work in the existing facilities.

C. Notification

1. At least 48 hours prior to commencement of a demolition or removal, notify the ENGINEER in writing of proposed schedule therefor. Owner shall inspect the existing equipment and to identify and mark those items which are to remain the property of the Owner. No removals shall be started without the permission of the ENGINEER.

D. Conditions of Structures

1. The Owner and the ENGINEER assume no responsibility for the actual condition of the structures to be demolished or modified.
2. Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, variations within a structure may occur prior to the start of demolition work.

E. Repairs to Damage

1. Promptly repair damage caused to adjacent facilities by demolition operation when directed by ENGINEER and at no additional cost to the Owner. Repairs shall be made to a condition at least equal to that which existed prior to construction.

F. Traffic Access

1. Conduct demolition and modification operations and the removal of equipment and debris to ensure minimum interference with roads, streets, walks both onsite and offsite and to ensure minimum interference with occupied or used facilities.
2. Special attention is directed towards maintaining safe and convenient access to the existing facilities by plant personnel and plant associated vehicles.
3. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the ENGINEER. Furnish alternate routes around closed or obstructed traffic in access ways.

G. Disposal

1. All materials and equipment removed from existing work shall become the property of the CONTRACTOR.
2. Dispose of all demolition materials, equipment, debris and all other items off the site and in conformance with all existing applicable laws and regulations.

H. Pollution Controls

1. Use water sprinkling, temporary enclosures and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.
 - a. Do not use water when it may create hazardous or objectionable conditions such as flooding and pollution.
 - b. Clean adjacent structures, facilities, and improvements of dust, dirt and debris caused by demolition operations. Return adjacent areas to conditions existing prior to the start of the work.

3.02 CLEAN-UP

- A. Remove from the site all debris resulting from the demolition operations as it accumulates. Upon completion of the work, all materials, equipment, waste and debris of every sort shall be removed and premises shall be left, clean, neat and orderly.

END OF SECTION

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SECTION 02100

SITE PREPARATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials and equipment required and perform all site preparation, complete as shown on the Drawings and as specified herein.
- B. Obtain all permits required for site preparation work prior to proceeding with the work, including clearing and tree removal.
- C. The areas to be cleared, grubbed and stripped within public rights-of-way and utility easements will be minimized to the extent possible. No unnecessary site preparation within these areas will be performed.

1.02 RELATED WORK

- A. Sodding is included in Section 02932.

1.03 SUBMITTALS

- A. Submit to the Engineer, in accordance with Section 01300, copies of all permits required prior to clearing, grubbing, and stripping work.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 CLEARING

- A. Cut and remove all timber, trees, stumps, brush, shrubs, roots, grass, weeds, rubbish and any other objectionable material resting on or protruding through the surface of the ground.
- B. Preserve and protect trees and other vegetation designated on the Drawings or directed by the Engineer to remain.

3.02 GRUBBING

- A. Grub and remove all stumps, roots in excess of 1-1/2-in in diameter, matted roots, brush, timber, logs, concrete rubble and other debris encountered to a depth of 18-in below original grade or 18-in beneath the bottom of foundations, whichever is deeper.
- B. Refill all grubbing holes and depressions excavated below the original ground surface with suitable materials and compact to a density conforming to the surrounding ground surface in accordance with Section 02220.

3.03 DISPOSAL

- A. Dispose of material and debris from site preparation operations by hauling such materials and debris to an approved offsite disposal area. No rubbish or debris of any kind will be buried on the site.
- B. No on-site disposal of cleared and grubbed materials by open-air burning will be permitted by the Owner.

3.04 PROTECTION

- A. Trees and other vegetation designated on the Drawings or directed by the Engineer to remain will be protected from damage by all construction operations by erecting suitable barriers, guards and enclosures, or by other approved means. Conduct clearing operations in a manner to prevent falling trees from damaging trees and vegetation designated to remain and to the work being constructed and so as to provide for the safety of employees and others.
- B. Maintain protection until all work in the vicinity of the protected trees and vegetation has been completed.
- C. Do not operate heavy equipment or stockpile materials within the branch spread of existing trees.
- D. Immediately repair any damage to existing tree crowns, trunks, or root systems. Roots exposed and/or damaged during the work will immediately be cut off cleanly inside the exposed or damaged area. Treat cut surfaces with an acceptable tree wound paint and topsoil spread over the exposed root area.
- E. When work is completed, remove all dead and downed trees. Live trees will be trimmed of all dead and diseased limbs and branches. All cuts will be cleanly made at their juncture with the trunk or preceding branch without injury to the trunk or remaining branches. Cuts over 1-in in diameter will be treated with an acceptable tree wound paint.
- F. Restrict construction activities to those areas within the limits of construction designated on the Drawings, within public rights-of-way, and within easements provided by the Owner. Adjacent properties and improvements thereon, public or private, which become damaged by construction operations will be promptly restored to their original condition, to the full satisfaction of the property owner.

END OF SECTION

SECTION 02140

DEWATERING AND DRAINAGE

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Design, furnish, install, operate, monitor, maintain and remove a temporary dewatering system as required to lower and control water levels at least 1-ft below pipe trench bottom and 2-ft below subgrades of structural excavations, and to permit construction to proceed in-the-dry. Deviations to requirements specified within this document must be approved by the ENGINEER.
- B. Furnish, maintain and remove temporary surface water control measures to prevent surface water from entering excavations.
- C. Retain the services of a professional engineer registered in the State of Florida to prepare dewatering and drainage system designs and submittals described herein.
- D. Collect and properly dispose of all discharge water from the dewatering operations. Obtain permits required for discharge of groundwater from dewatering operations.
- E. Repair damage caused by dewatering and drainage system operations.

1.02 DESIGN REQUIREMENTS

- A. The CONTRACTOR is responsible for the proper design and implementation of methods for controlling surface water and groundwater.
- B. The primary purpose of the groundwater control system is to preserve the natural undisturbed condition of the subgrade soils in the areas of the proposed excavations. Prior to excavation, the CONTRACTOR shall lower the groundwater to at least 1-ft below pipe trench bottom and 2-ft below the lowest excavation structural subgrade elevation. Additional groundwater lowering may be necessary beyond the requirements above, depending on construction methods and equipment used and the prevailing groundwater and soil conditions. Dewatering shall be sufficient to control piezometric pressures to avoid any heave or destabilization of the excavation bottoms. The CONTRACTOR is responsible for lowering the groundwater as necessary to complete construction in accordance with the plans and specifications at no additional cost to the OWNER.
- C. Design well points and sumps, and all other groundwater control system components to prevent loss of fines from surrounding soils. Sand filters shall be used with all dewatering installations unless screens are properly sized by the Contractor's design engineer to prevent passage of fines from surrounding soils.
- D. The CONTRACTOR shall be responsible for damage to properties, buildings or structures, pipelines and other utility installations, pavements and work that may result from dewatering or surface water control operations.
- E. Design review and field monitoring activities by the OWNER or by the ENGINEER shall not relieve the CONTRACTOR of his/her responsibilities for the work.

1.03 SUBMITTALS

- A. Dewatering and drainage system design plans shall be prepared and stamped by an experienced licensed professional engineer registered in the state of Florida and retained by the CONTRACTOR. At least two weeks prior to the commencement of work, the CONTRACTOR shall submit an original and three copies of the licensed professional engineer's certification on the PE form specified in Section 01300. The CONTRACTOR shall also submit qualifications as required herein.
- B. The plan shall include a description of the proposed dewatering system and include the proposed installation methods to be used for dewatering and drainage system elements and for observation wells. The plan shall include equipment, drilling methods, holes sizes, filter sand placement techniques, sealing materials, development techniques, the number and location of dewatering points, observations wells and piezometers, etc. Include the dewatering system design calculations in the plan.
- C. Coordinate dewatering and drainage submittals with the excavation and support of excavation submittals. The submittal shall show the areas and depths of excavation to be dewatered.
- D. Do not proceed with any excavation or dewatering activities until the dewatering submittals have been reviewed by the ENGINEER for conformance with the Contract Documents and for general compatibility with the work and with accepted engineering practices.

1.04 QUALITY ASSURANCE

- A. Regulations: Perform all work in accordance with current applicable regulations and codes of all Federal, State and local agencies.
- B. The CONTRACTOR shall have at least 5 years of experience with dewatering system operations comparable to the dewatering operations required for the performance of the Work, employing labor and supervisory personnel who are similarly experienced in this type of Work.
- C. The Contractor's design engineer shall be registered in the State of Florida and have a minimum of 5 years of professional experience in the design and construction of dewatering and drainage systems and shall have completed not less than 5 successful dewatering and drainage projects of equal type, size, and complexity to that require for the work.

1.05 DEFINITIONS

- A. Where the phrase "in-the-dry" is used in this Section, it shall be defined as an excavation subgrade where the groundwater level has been lowered to at least 1-ft below trench bottom for pipelines and 2-ft below the lowest level of the excavation for structures, is stable with no ponded water, mud, or muck, is able to support construction equipment without rutting or disturbance and is suitable for the placement and compaction of fill material, pipe or concrete foundations.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Observation wells and piezometers shall consist of minimum 2-in I.D, Schedule 40 PVC pipe and machine slotted PVC wellpoints, maximum slot size 0.010-in., and shall conform to the details as shown on the Drawings.

- B. Piping, pumping equipment and all other materials required to provide control of surface water and groundwater shall be suitable for the intended purpose.
- C. Standby pumping systems and a source of standby power shall be maintained at all sites.

PART 3 - EXECUTION

3.01 GENERAL

- A. Control surface water and groundwater such that excavation to final grade is made in-the-dry, the natural undisturbed condition of the subgrade soils are maintained, and softening and/or instability or disturbance due to the presence or seepage of water does not occur. All construction and backfilling shall proceed in-the-dry and flotation of completed portions of work shall be prohibited.
- B. Methods of groundwater control may include but are not limited to perimeter trenches and sump pumping, perimeter groundwater cutoff, well points, ejectors, deep wells and combinations thereof.
- C. Where groundwater levels are above the proposed bottom of excavation level, a pumped dewatering system will be required for predrainage of the soils prior to excavation, and for maintaining the lowered groundwater level and controlling piezometric pressures, until construction has been completed to such an extent that the structure, pipeline or fill will not be floated or otherwise damaged.
- D. It is expected that the type of system, spacing of dewatering units and other details of the work will have to be varied depending on soil/water conditions at a particular location.
- E. All work included in this Section shall be done in a manner which will protect adjacent structures and utilities and shall not cause loss of ground or disturbance.
- F. Install, monitor and report data from observation wells. Evaluate the collected data relative to groundwater control system performance and modify systems as necessary to dewater the site in accordance with the Contract requirements.
- G. Locate groundwater control system components where they will not interfere with construction activities adjacent to the work area or interfere with the installation and monitoring of geotechnical instrumentation including observation wells. Excavations for sumps or drainage ditches shall not be made within or below 1H: 1V slopes extending downward and out from the edges of existing or proposed foundation elements or from the downward vertical footprint of the pipe.

3.02 SURFACE WATER CONTROL

- A. Construct surface water control measures, including dikes, ditches, sumps and other methods to prevent, as necessary, flow of surface water into excavations and to allow construction to proceed without delay.

3.03 EXCAVATION DEWATERING

- A. At all times during construction, provide and maintain proper equipment and facilities to promptly remove and properly dispose of all water entering excavations. Excavations shall be maintained in-the-dry.

- B. Excavation dewatering shall maintain the subgrade in a natural undisturbed condition and until the fill, structure or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural elevations.
- C. Pipe, masonry, and concrete shall not be placed in water or be submerged within 24 hours after being installed. Water shall not flow over new masonry or concrete within four days after placement.
- D. In no event shall water rise to cause unbalanced pressure on structures until the concrete or mortar has set at least 24 hours. Prevent flotation of the pipe by promptly placing backfill.
- E. Dewatering shall at all times be conducted in such a manner as to preserve the natural undisturbed condition of the subgrade soils at the proposed bottom of excavation.
- F. If the subgrade of the trench or excavation bottom becomes disturbed due to inadequate dewatering or drainage, excavate below normal grade as directed by the ENGINEER and refill with bedding rock or other material as approved by the ENGINEER at no additional cost to the OWNER.
- G. It is expected that the initial dewatering plan may have to be modified to suit the variable soil/water conditions to be encountered during construction. Dewater and excavate, at all times, in a manner which does not cause loss of ground or disturbance to the bearing soil or soil which supports overlying or adjacent structures or instability of the excavation.
- H. If the method of dewatering does not properly dewater the excavation as specified, install additional groundwater observation wells as directed by the ENGINEER and do not place any pipe or structure until the readings obtained from the observation wells indicate that the groundwater has been lowered as specified within the excavation limits.
- I. Dewatering units used in the work shall be surrounded by suitable filter sand and no fines shall be removed by pumping. Pumping from the dewatering system shall be continuous until pipe or structure is adequately backfilled. Stand-by pumps shall be provided.
- J. Existing or new sanitary sewers shall not be used to dispose of drainage.

3.04 WELL POINT SYSTEMS

- A. Where necessary, install a vacuum wellpoint system or deep wells around the excavation to dewater the excavation. Each wellpoint and/or well and riser pipe shall be surrounded by a sand or gravel filter. Sand shall be of such a gradation that, after initial development of the wellpoints or wells, the quantity and size of soil particles discharged shall be negligible.
- B. Wellpoint systems shall be capable of operating continuously under the highest possible vacuum.
- C. Installation of wellpoint systems or wells shall be in accordance with the approved submittal in the presence of the ENGINEER.

3.05 REMOVAL OF SYSTEMS

- A. At the completion of the excavation and backfilling work, and when approved by the ENGINEER, wellpoints, pumps, generators, other equipment and accessories used for the groundwater and surface water control systems shall be removed from the site. All materials and equipment shall

become the property of the CONTRACTOR. All areas disturbed by the installation and removal of groundwater control systems and observation wells shall be restored to their original condition.

- B. All deep wells, observation wells, and piezometers shall be properly installed and abandoned per SWFWMD requirements.

END OF SECTION

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SECTION 02213

ROCK AND BOULDER EXCAVATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals required and perform excavation and disposal of rock and boulders in open cut trench excavation. at no additional cost to the OWNER.
- B. Rock and boulder excavation shall mean the removal of rock in open cut trench excavation which, in the opinion of the ENGINEER, requires for its removal, wedging, sledging, cutting, or barring. Rock and boulder excavation shall be made in accordance with the "Typical Trench" detail for pipes and as shown on the Drawings, or determined by the ENGINEER at no additional cost to the OWNER.
- C. Blasting will not be permitted.

1.02 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related requirements:
 - 1. Structural Excavation, Backfilling and Compaction is included in Section 02220.
 - 2. Trenching, Bedding, and Backfill for Pipe is included in Section 02221.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Gravel fill shall meet the specifications and gradation requirements for Class 57 Stone from the Florida Department of Transportation Standard Specifications for Road and Bridge Construction.

PART 3 – EXECUTION

3.01 DISPOSAL AND REPLACEMENT OF ROCK

- A. Excavated rock and boulder material exceeding 6-inches in diameter shall not be used for backfilling unless otherwise approved. Rock of 3-1/2 - 6-inches in diameter can be used in the fill material except for the following exceptions; maximum of 1-1/2-inches within 12-inches of a pipeline and a maximum of 2-inches within 12-inches of a road subgrade or a structure. Rock and boulder material disposed by wasting shall be replaced by suitable excavation. Approved borrow to supply any deficiency of backfill shall be provided at no additional cost.
- B. Excavated rock that meets the criteria for FDOT No. 89 stone may be processed and used for pipeline or structure bedding material, subject to the approval of the ENGINEER. Backfilling is further specified in Section 02220 and 02221.

END OF SECTION

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SECTION 02220

STRUCTURAL EXCAVATION, BACKFILL & COMPACTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. This Section includes, except as elsewhere provided, excavation (unclassified), filling and grading under and around cast-in-place or precast concrete structures to the subgrades and grades indicated on the Drawings.
- B. Supplemental Foundation and Site Preparation Notes may be indicated on the Structural Drawings.
- C. The CONTRACTOR shall be required to obtain a Town of Longboat Key Building Department permit prior to initiating excavation activities.
- D. At the location of the venturi meter vault, the CONTRACTOR shall provide to the ENGINEER one Standard Penetration Test boring near the proposed center of the venturi meter structure to a depth of 15 ft. in accordance with ASTM D-1586 with continuous samples (i.e. 1.5 ft. intervals). The soils shall be classified in accordance with both the Unified Soil Classification (ASTMD2487) and AASHTO Soil Classification (AASHTO M-145). The boring log shall be signed and sealed by a Florida Registered Professional engineer with a Geotechnical engineering specialty. The test boring log shall be provided to CDM Smith's Geotechnical ENGINEER for review.

1.02 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related requirements:
 - 1. Trenching Bedding and Backfill for Pipe is included in Section 02221.
 - 2. Dewatering and Drainage is included in Section 02140.

1.03 QUALITY ASSURANCE

- A. Codes and Standards:
 - 1. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
- B. Testing and Inspection Service:
 - 1. The CONTRACTOR shall engage soil testing and inspection service for quality assurance testing during earthwork operations.
- C. All excavation, trenching, and related sheeting, bracing etc. shall conform to the requirements of the Florida Trench Safety Act (C5/5B 2626) which incorporates by reference, OSHA's excavation safety standards, (29 CFR 1926.650 Subpart P), to the requirements of Section 02311

1.04 JOB CONDITIONS

- A. The CONTRACTOR shall examine the site and review the available test borings or undertake his

own soil borings prior to submitting his bid, taking into consideration all conditions that may affect his work. The OWNER and ENGINEER will not assume responsibility for variations in subsurface conditions at locations other than investigation locations shown and at the time the investigation was made.

- B. Existing Utilities: Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
 - 1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult ENGINEER and Owner of such piping or utility immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility OWNER.
 - 2. Demolish and completely remove from site existing underground utilities indicated on the Drawings to be removed.
- C. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.
 - 1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1.05 PROTECTION

- A. Sheet piling and Bracing in Excavations:
 - 1. Sheet piling and Bracing in Excavations shall be in accordance with Section 02311.
- B. Dewatering, Drainage and Flotation:
 - 1. Conduct dewatering and drainage in accordance with Section 02140.

1.06 SUBMITTALS

- A. Provide submittals required under Sections 02140 and 02311.
- B. Furnish the ENGINEER, for approval, a representative sample of fill material obtained from onsite sources weighing approximately 100 pounds, at least (7) calendar days prior to the date of anticipated use of such material.
- C. For each material obtained from other than onsite sources, notify the ENGINEER of the source of the material and furnish the ENGINEER, for approval, a representative sample weighing approximately 100 pounds, at least (7) calendar days prior to the date of anticipated use of such material.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Common Soil: Common Soil materials shall be soils having a group classification of SP, SP-SM, or SP-SC, GM, or GC in accordance with the Unified Soil Classification per ASTM D2487. SM and SC may be used if they are effectively blended on-site with the cleaner sands to reduce the fines contents to 12% or less. Perform lab testing to verify fines content of blended soils. Particles larger than 3-1/2-inch in diameter shall not be allowed in these materials.

- B. Select Common Soil and Structural Fill: Select common fill and structural fill materials shall be soils having a group classification of SP, SP-SM, SP-SC, GM, or GC with a maximum of 12” fines (portion passing the #200 US Standard Sieve). Particles larger than 1-1/2-inch in diameter shall not be allowed in these materials. These materials should be free of marl, hardpan, broken concrete, masonry, rubble or other similar materials. The organic content of these materials shall not exceed 2.5 percent by weight.
- C. Unsuitable Materials: Unsuitable materials are soil, soil-aggregate and rock having a classification of MH, ML, CH, CL or PT, along with materials having an organic content exceeding 5.0 percent by weight.
- D. Crushed Stone: Crush stone shall be crushed limestone, granite, or concrete and conforming to the gradation requirements for FDOT No. 57 coarse aggregate.
- E. Geotextile Fabric: Mirafi 140N, or equal.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Examine the areas and conditions under which excavating, filling, and grading are to be performed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 EXCAVATION

- A. Excavations for structures shall be suitably wide for construction of the structures, including excavation supports, dewatering and drainage systems and working clearances. Excavation shall be provided a minimum of 2 feet beyond the footprint of the structure (ie two feet beyond the edge of slab or toe). Each Structure area and for a distance of at least 10 feet beyond the outside perimeter, should be stripped of all surface vegetation, pavements, near surface organic soils, root concentrations, and other objectionable material.
- B. Excavation shall be performed in-the-dry and shall be accomplished by methods which preserve the undisturbed state of subgrade soils. Drainage and dewatering systems shall be in place and operational prior to beginning excavation work. Groundwater levels should be controlled to at least two feet below maximum excavation depth. In no case shall the earth be plowed, scraped or excavated by any means that would disturb the finished subgrade.
- C. Additional Excavation:
 - 1. When excavation has reached the required subgrade elevation, notify the ENGINEER who will make an inspection of conditions.
 - 2. If unsuitable bearing materials are encountered at the required subgrade elevations, carry excavations deeper and replace the excavated material with crushed stone and geotextile underlayment as approved by the ENGINEER.
 - 3. Removal of unsuitable material and its replacement below the required subgrade elevations, as directed by the ENGINEER, will be paid at the unit price bid item for Excavation Below Normal Grade and Crushed Stone Refill (See Sections 01025 and 02223).
 - 4. Subgrade soils which become soft, loose, “quick”, or otherwise unsatisfactory for support of structures as a result of inadequate excavation, dewatering, or other construction methods shall be removed and replaced with crushed stone with geotextile underlayment subject to prior approval by the ENGINEER, at no additional cost to the OWNER.

D. Stability of Excavations:

1. Slope sides of excavations shall comply with local codes and ordinances having jurisdiction or as shown on the Drawings. Shore and brace where sloping is not possible because of space restrictions or instability of material excavated.
2. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

E. Shoring and Bracing:

1. Provide excavation support and protection in accordance with Section 02311.

F. Dewatering:

1. Provide dewatering and drainage in accordance with Section 02140.

G. Material Storage:

1. Stockpile satisfactory excavated materials where approved, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.
2. Locate and retain soil materials away from edge of excavations.
3. Dispose of excess soil material and waste materials as herein specified.

H. Cold Weather Protection:

1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

3.03 BACKFILL AND FILL

A. General:

1. Place material in layers to required subgrade elevations, for each material classification listed below.
2. Structural fill shall be used below spread footing foundations, slabs, and other structures and as backfill within 3 feet horizontally of the below grade portion of structures.
3. 12" of crushed stone shall be used as backfill in overexcavated areas per paragraph 3.02.C, and at other locations indicated on the Drawings or approved by the ENGINEER.
4. Common soil shall be used at all other locations.

B. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Acceptance by ENGINEER of construction below finish grade including, where applicable, dampproofing, waterproofing and perimeter insulation.
2. Inspection, testing, approval and recording locations of underground utilities.
3. Removal of concrete formwork.
4. Removal of trash and debris.

C. Ground Surface Preparation:

1. Remove vegetation, debris, unsuitable 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 materials will bond with existing surface.
2. Subgrades shall be proof rolled with at least 4 passes with the equipment described herein, unless approved by the Engineer. The ENGINEER will waive this requirement, if, in his opinion, the subgrade will be rendered unstable by such compaction.

D. Fill Placement:

1. Material placed in fill areas under and around structures shall be deposited within the lines and to the grades shown on the Drawings or as approved by the ENGINEER, making due

allowance for settlement of the material. Backfill shall be carried up evenly on all walls of an individual structure simultaneously with no more than one-foot elevation variation allowed. Fill shall be placed only on properly prepared surfaces which have been inspected and approved by the ENGINEER.

2. Fill material can be obtained from cut areas (spoil only) within the construction project site. If sufficient common soil or select common soil material is not available from excavation on site, the CONTRACTOR shall provide fill material as required from off-site sources at no additional cost to the OWNER.
3. Fill shall be brought up in substantially level lifts, starting in the deepest portion of the fill. The entire surface of the work shall be maintained free from ruts, and in such condition that construction equipment can readily travel over any section. Fill shall not be placed on surfaces that are muddy, frozen, or against concrete structures until they have attained sufficient strength.
4. During the process of placing and spreading fill, all roots, debris and stones greater in size than specified under "Materials", shall be removed from the fill areas, and the CONTRACTOR shall assign a sufficient number of men to this work to ensure satisfactory compliance with these requirements.
5. If the compacted surface of any layer of material is determined to be too smooth to bond properly with the succeeding layer, it shall be loosened by harrowing or by an other approved method before the succeeding layer is placed.
6. All fill materials shall be placed and compacted "in-the-dry." The CONTRACTOR shall dewater excavated areas as required to perform the work and in such a manner as to preserve the undisturbed state of the natural soils.

3.04 COMPACTION

A. General:

1. Control soil compaction during construction providing minimum percentage of density specified herein or on the Drawings for each material classification. It shall be the CONTRACTOR's responsibility to notify the ENGINEER in writing when density tests are to be performed. Written notice from the CONTRACTOR shall precede completion of compaction operations by at least two working days.
2. Density test frequency for concrete slabs shall be 1 per 1,000 square feet at the surface of compaction and for each lift. Density test frequency under spread footings shall be 1 per 25 lineal feet of footing for each lift.

B. Percentage of Maximum Density Requirements:

1. Compact soil to not less than the following percentages of maximum dry density in accordance with ASTM D1557.
 - a. Underneath structures including slabs on grade and 3 feet around perimeter of foundation, compact each layer of structural backfill material to not less than 95 percent maximum dry density.
 - b. Under slabs and footing, compact each layer of structural backfill material to not less than 95 percent maximum dry density.
 - c. In lawn and unpaved areas, compact each layer of backfill or fill material to not less than 92 percent maximum dry density.
 - d. In walkways, compact each layer of backfill to not less than 95 percent maximum dry density.
 - e. In rigid pavement and steps, compact each layer of backfill to not less than 95 percent maximum dry density.

2. Moisture content of soil shall be within minus 2 percentage points to plus 2 percentage points of the optimum.

C. Moisture Control:

1. Where subgrade or layer of fill material must be moisture conditioned before compaction, uniformly apply clean water to surface of subgrade, or layer of fill material. Prevent free water appearing on surface during or subsequent to compaction operations.
2. Remove and replace, or scarify and air dry, fill material that is too wet to permit compaction to specified density.
3. Fill material that has been removed because it is too wet to permit compaction but is otherwise satisfactory may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value.

- D. Structural fill shall be placed in layers not more than 9 inches loose depth for material compacted by heavy compaction equipment. Compaction shall be accomplished with appropriate vibratory or impact type equipment to achieve a minimum compaction of at least 95 percent of maximum dry density uniformly throughout each fill lift. Incidental compaction due to traffic by construction equipment will not be credited toward the required minimum coverages.

- E. Common soil shall be placed and compacted in a manner similar to that described above for structural fill, with the following exceptions:

1. Layer thickness prior to compaction may be increased to 12 inches in open areas.
2. Each layer shall be compacted to at least 92 percent of maximum dry density.

- F. Large compaction equipment shall not be used within 5 feet of walls. Compaction equipment is subject to approval by the ENGINEER.

- G. Place fill material in layers not more than 6 inches loose depth for material compacted by hand-operated tampers. Use manually operated sled-type vibratory compactors next to structures and in confined areas not accessible to heavy mechanical compaction equipment.

- H. If the ENGINEER shall determine that added moisture is required, water shall be applied by sprinkler tanks or other sprinkler systems, which will ensure uniform distribution of the water over the area to be treated, and give complete and accurate control of the amount of water to be used. If too much water is added, the area shall be permitted to dry before compaction is continued. Compaction by puddling and water jetting is not allowed.

- I. The CONTRACTOR shall supply all hose, piping, valves, sprinklers, pumps, sprinkler tanks, hauling equipment and all other materials and equipment necessary to place the water in the fill in the manner specified.

3.05 GRADING

A. General:

1. Uniformly grade fill areas within limits of project including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades. No soft spots or uncompacted areas will be allowed in the work.

B. Grading Outside Building Lines:

1. Grade areas adjacent to building lines, as shown on the Drawings, to drain away from

structures and to prevent ponding. Finish surfaces free from irregular surface changes, and as follows:

- a. Finish lawn or unpaved areas to within not more than 0.10 feet above or below the required elevation.
 - b. Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.15 feet above the required subgrade and not below surrounding grade to avoid ponding water from runoff.
- C. Grading Surface of Fill Under Building Slabs or Slabs on grade:
1. Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2-inch when tested with a 10-foot straightedge.
- D. Stones or rock fragments larger than 1-1/2 inches in their greatest dimension will not be permitted in the top 12- inches of subgrade line of all fills or embankments.
- E. All cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings, or as approved in writing by the ENGINEER to prevent ponding water on driveways, walkways or against structures.
- F. During grading, protect all buried valve extensions and covers, sprinklers and any other mechanical or structural object protruding from below grade.

3.06 EARTH EMBANKMENTS

- A. All organic materials, including peat and topsoil, shall be removed from areas beneath new embankments. If the subgrade slopes are excessive, the subgrade shall be stepped to produce a stable surface for the placement of the embankments. The natural subgrade shall then be compacted with at least 4 passes by suitable mechanical compaction equipment. The ENGINEER will waive this requirement, if, in his opinion, the subgrade will be rendered unstable by such compaction. The prepared subgrade shall be inspected and approved by the ENGINEER prior to the placement of structural fill.
- B. Common soil shall be placed in layers 12-inches thick measured before compaction. Each layer shall be compacted to at least 92 percent of the maximum dry density.
- C. Existing slopes shall be reconstructed as shown on the Drawings.

3.07 FIELD QUALITY CONTROL

- A. Quality Assurance Testing During Construction:
 1. Allow the ENGINEER to observe compacted subgrades and fill layers and review density test results before further construction work is performed.
- B. If in the opinion of the ENGINEER, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense to the OWNER.

3.08 MAINTENANCE

- A. Protection of Graded Areas:
 1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

2. Repair and re-establish grades in settled, eroded and rutted areas to specified tolerances.

B. Reconditioning Compacted Areas:

1. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape and compact to required density prior to further construction.

3.09 DISPOSAL OF SURPLUS AND WASTE MATERIAL

A. All surplus and/or unsuitable excavated material shall be disposed of in the following way.

1. Transport from the OWNER's property and legally dispose of. Any permit required for the hauling and disposing of this material beyond the OWNER's property shall be obtained by the CONTRACTOR prior to commencing hauling operations.

B. Excavated material may be used for fill if it meets the specifications for common soil or select common soil material and is approved by the ENGINEER. Excavated material so approved may be neatly stockpiled at the site where designated by the CONTRACTOR and approved by the ENGINEER.

C. Excavated rock may be used in open fill areas only with the approval of the ENGINEER.

END OF SECTION

SECTION 02221

EXCAVATION, BEDDING, AND BACKFILL FOR PIPE

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals necessary to perform all excavation (unclassified), backfill, fill, grading and slope protection required to complete the piping work shown on the Drawings and specified herein.
- B. The CONTRACTOR shall provide dewatering and drainage systems in accordance with Section 02140.
- C. The CONTRACTOR shall provide excavation support and protection in accordance with Section 02311.
- D. All excavation and related sheeting, shoring, and bracing shall conform to the requirements of the Florida Trench Safety Act, (C5/5B 2626), which incorporates by reference, OSHA's excavation safety standards (29 CFR 1926.650 Subpart P).

1.02 JOB CONDITIONS

- A. The CONTRACTOR shall examine the site and review the available test borings or undertake his own soil borings prior to submitting his bid, taking into consideration all conditions that may affect his work. The OWNER and ENGINEER will not assume responsibility for variations of sub-soil quality or conditions at locations other than places shown and at the time the investigation was made.
- B. Existing Utilities: Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
 - 1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the ENGINEER and the owner of such piping or utility immediately for directions.
 - 2. Cooperate with owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 - 3. Demolish and completely remove from site existing underground utilities indicated on the Drawings to be removed.
- C. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.
 - 1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1.03 SUBMITTALS

- A. For each bedding and backfill material obtained from other than onsite sources, the CONTRACTOR shall notify the ENGINEER of the source of the material and shall furnish the

ENGINEER, for approval, a representative sample weighing approximately 50 pounds, at least 7 calendar days prior to the date of anticipated use of such material.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Common Soil: Common Soil materials shall be soils having a group classification of SP, SP-SM, or SP-SC, GM, or GC in accordance with the Unified Soil Classification per ASTM D2487. SM and SC may be used if they are effectively blended on-site with the cleaner sands to reduce the fines contents to 12% or less. Perform lab testing to verify fines content of blended soils. Particles larger than 3-1/2-inch in diameter shall not be allowed in these materials.
- B. Select Common Soil and Structural Fill: Select common fill and structural fill materials shall be soils having a group classification of SP, SP-SM, SP-SC, GM, or GC with a maximum of 12% fines (portion passing the #200 US Standard Sieve). Particles larger than 1-1/2-inch in diameter shall not be allowed in these materials. These materials should be free of marl, hardpan, broken concrete, masonry, rubble or other similar materials. The organic content of these materials shall not exceed 2.5 percent by weight.
- C. Unsuitable Materials: Unsuitable materials are soil, soil-aggregate and rock having a classification of MH, ML, CH, CL or PT, along with materials having an organic content exceeding 5.0 percent by weight.
- D. Bedding Rock: Bedding rock shall be washed and graded crushed limestone or shell and conform to the gradation requirements of FDOT No. 89 coarse aggregate.

PART 3 – EXECUTION

3.01 GENERAL

- A. All excavation, backfill and grading necessary to complete the work shall be made by the CONTRACTOR and the cost thereof shall be included in the contract price.
- B. The CONTRACTOR shall take all the necessary precautions to maintain the work area in a safe and workable condition.
- C. The CONTRACTOR shall protect his work at all times by flagging, marking, lighting and barricading. It shall also be the CONTRACTOR's responsibility to preserve and protect all above and underground structures, pipe lines, conduits, cables, drains or utilities which are existing at the time he encounters them. Failure of the Drawings to show the existence of these obstructions shall not relieve the CONTRACTOR from this responsibility. The cost of repair of any damage which occurs to these obstructions during or as a result of construction shall be borne by the CONTRACTOR without additional cost to the OWNER.

3.02 EXCAVATION

- A. Excavations for the installation of structures, pipes, and electrical ducts shall be made to the depths indicated on the Drawings. Excavate in such manner and to such widths as will give suitable room for installing structures, pipes, or ducts, for bracing and supporting and for pumping and drainage facilities.

- B. The bottom of the excavations shall be firm and dry and in all respects acceptable to the ENGINEER. Excavate unsuitable soil material from the bottom of the trench to a depth determined by the ENGINEER and replace with rock bedding.
- C. Where pipe or ducts are to be laid in bedding rock or the trench may be excavated by machinery to, or just below, the designated subgrade provided that the material remaining in the bottom of the trench is no more than slightly disturbed.
- D. Where the pipes or ducts are to be laid directly on the trench bottom the lower part of the trenches shall not be excavated to the trench bottom by machinery. The last of the material being excavated shall be done manually in such a manner that will give a flat bottom true to grade so that pipe or duct can be evenly and uniformly supported along its entire length. Bell holes shall be made as required manually so that there is no bearing surface on the bells and pipes are supported along the barrel only.

3.03 STAGE 1 BEDDING

- A. Pressure pipes shall be bedded using bedding rock by the following procedures:
 - 1. Beginning at the bottom of the trench, bedding rock shall be placed and compacted to springline of the pipe, from the centerline of the pipe to the trench wall. Lift thickness shall not exceed 6 inches. Each lift shall be compacted using at least two passes with a vibratory plate compactor.
- B. Above Stage 1, fill shall be placed and compacted as described below under "Backfilling."
- C. Where stone bedding is used, an impermeable groundwater barrier at 100-foot intervals along the trench shall be used. The impermeable groundwater barrier shall consist of a 10 mil sheet of polyethylene covering the full cross sectional area of the gravel, embedded 6 inches into the trench sides and bottom, and extending to the top of the bedding rock. The barrier shall be offset a minimum of 2 feet from any culvert or pipe joint. Ends and splice points shall be lapped a minimum of 12 inches.

3.04 BACKFILLING

- A. Where pipes are located under paved, or unpaved, roadways, driveways, or sidewalks, the remainder of the trench above the Stage 1 bedding, as described above, shall be backfilled and thoroughly compacted with select common soil. Select common soil shall be placed and compacted in layers not to exceed 6 inches to 98 percent maximum density per AASHTO. Moisture content of the soil shall be within minus 2 percent to plus 2 percent of the optimum.
- B. Where pipes are not located under roadways, driveways, or sidewalks, the remainder of the trench above the Stage 1 bedding as described above, shall be filled and thoroughly compacted with common soil. From springline of pipe to a height of 12 inches above crown of pipe, compact common soil in maximum 6-inch layers to 98 percent maximum density per AASHTO T-180. Remainder of trench may be backfilled with common soil in maximum 12-inch layers to 98 percent maximum density per AASHTO T-180. Moisture content of the soil shall be within minus 2 percent to plus 2 percent of the optimum.

3.05 MARKING TAPE

- A. A polyethylene double safe detectable marking tape shall be installed continuously in the backfill along the entire length of all PVC water mains for identification and detection purposes. For pipe

sizes smaller than 12 inches, a single 2 inch wide stripe along the top of the pipe shall be provided. As directed by the OWNER, buried ductile iron pipe for unforeseen conflicts shall be encased in a colored tubular polywrap conforming to 100% polyethylene material in accordance with ASTM D1248-84 type 1, Class C, grade E-1, tensile strength 1200 psi, elongation 300%.

- B. The tape shall be as manufactured by Thor Enterprises or equal. The polyethylene tape shall meet the requirements of ASTM D 1248, Type I, Class A, Grade E 1 for polyethylene plastics molding and extrusion materials. The tape shall have a minimum tensile strength of 1750 psi, a minimum elongation of 250 percent, not less than 50 gauge solid aluminum core and a nominal thickness of 5 mils. The tape shall be composed of 2 mil clear film reverse printed laminated to aluminum, foil laminated to 2 mil clear film and reverse printed. Minimum total thickness 4 mils.
- C. The warning tape shall be printed on one side in black letters (typical for all lettering) and shall be fade resistant olive green color as follows:

CAUTION: BURIED RAW WATER MAIN BELOW

Minimum marking tape widths shall be as follows:

Pipe Inside Diameter, Inches	Minimum Tape Width, Inches	No. of Tape Strips
2 and Less	4	1
14-20	4	2
24 & Larger	4	3

- D. The CONTRACTOR shall submit typical samples of the printed marking tape to the ENGINEER for approval prior to installation (minimum length to show repeat of message).
- E. The marking tape shall be placed in the trench backfill directly above and centered over the pipeline. The marking tape shall be installed between 12 and 18 inches above the top of the pipe. The CONTRACTOR shall exercise care to prevent damage to the polyethylene tape when placing the remaining backfill.
- F. Where the pipeline passes through in a manhole, vault or other underground structure, the polyethylene marking tape shall be placed on top of that portion of the pipeline, located inside the structure and shall be secured to the pipeline with adhesive tape.
- G. Openings for air valves and similar appurtenances shall be provided by making an X shaped cut in the polyethylene and temporarily folding back the film. After the polyethylene is installed over the appurtenance, the slack shall be taped securely to the appurtenance and the cut in the polyethylene shall be repaired with adhesive tape.

3.06 DISPOSAL OF UNSUITABLE AND SURPLUS MATERIAL

- A. Transport from OWNER's property and legally dispose of all surplus and/or unsuitable excavated material. Any permit required for the hauling and disposing of this material beyond OWNER's property shall be obtained by the CONTRACTOR prior to commencing hauling operations.

3.07 RESTORING TRENCH SURFACE

- A. Where the trench occurs adjacent to paved street, in shoulders or sidewalks, 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 trench excavation and which are not a part of the paved highway shall be restored by the CONTRACTOR to a condition at least equal to that existing before work began.
- C. In Sections where the pipelines pass through grassed areas, the CONTRACTOR shall, at his own expense, remove and replace the soil, or shall loam and sod the surface to the satisfaction of the ENGINEER. The depth of loam replaced shall be at least equal to that removed by the CONTRACTOR in his trenching operations, but in no event shall it be placed less than 4-inches in depth. Sod disturbed in front of existing developed lots shall be replaced to match the existing sod.

END OF SECTION

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SECTION 02223

EXCAVATION BELOW NORMAL GRADE AND BEDDING ROCK REFILL

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. If in the opinion of the ENGINEER, the material at or below the normal grade of the bottom of a trench or excavation is unsuitable for pipe or structure foundation, it shall be removed to the depth determined by the ENGINEER and replaced by bedding rock as applicable.
- B. Bedding rock used for pipe bedding is not included in the scope of work under this Section (see Section 02221).

1.02 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related requirements:
 - 1. Section 02140: Dewatering and Drainage
 - 2. Section 02221: Trenching, Bedding and Backfill
 - 3. Section 02311: Excavation Support and Protection

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Bedding rock shall be as specified in Section 02221.

PART 3 – EXECUTION

3.01 EXCAVATION AND BACKFILL

- A. Whatever the nature of unstable material encountered or the groundwater conditions, trench dewatering shall be complete and effective.
- B. If the material at the level of trench bottom is unsuitable, as determined by the ENGINEER, it shall be removed to the extent determined by the ENGINEER and the excavation refilled with crushed stone.
- C. If the CONTRACTOR excavates below normal grade of the trench bottom through error or for his own convenience, or through failure to properly dewater the trench, or disturbs the subgrade before dewatering is sufficiently complete, excavation below grade and furnishing and placing the refill material shall be performed at no additional cost to the OWNER

END OF SECTION

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SECTION 02270

SEDIMENTATION AND EROSION CONTROL

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, equipment, and incidentals necessary to perform all installation, maintenance, removal, and area cleanup related to sedimentation and erosion control work as required to prevent the transport of silt or sediment outside the limits of construction and as required with permit conditions and applicable laws and regulations. The work shall include, but not necessarily be limited to, installation of temporary access ways and staging areas, silt fences, temporary seeding, turbidity barriers, sediment removal and disposal, device maintenance, removal of temporary devices, temporary mulching, and final cleanup.

1.02 SUBMITTALS

- A. Within 30 days after award of Contract, the CONTRACTOR shall submit to the ENGINEER for approval, technical product literature for all commercial products to be used for sedimentation and erosion control.

1.03 QUALITY ASSURANCE

- A. The CONTRACTOR shall be responsible for the timely installation and maintenance of all sedimentation control devices necessary to prevent the movement of sediment from the construction site to off-site areas or into the stream or wetland system or preservation/conservation areas via surface runoff or underground drainage systems or surface waters. Measures in addition to those shown on the Drawings necessary to prevent the movement of sediment outside the limits of construction shall be installed, maintained, removed, and cleaned up at the expense of the CONTRACTOR. No additional charges to the OWNER will be considered.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Silt fences, turbidity barriers, and baled hay or straw shall be in accordance with FDOT standards.

PART 3 - EXECUTION

3.01 LOCATION OF SEDIMENT/EROSION CONTROL AND TURBIDITY BARRIERS

- A. Sediment/erosion control devices shall be installed at all locations shown on the plans, and at other locations as needed to comply with the requirements of this section.
- B. Sediment/erosion control devices shall be installed at all drainage structures.
- C. CONTRACTOR shall provide additional sediment/erosion control and turbidity barriers as needed to control the transport of silt and sediments outside of the limits of construction.

- D. Sediment/erosion control shall be installed around the base of all soil stockpile areas. All non-working faces of soil stockpiles, which will be in place longer than three months shall be seeded.
- E. Sediment/erosion control devices shall be installed along the perimeter of all staging areas.
- F. All disturbed areas, greater than 10,000 square feet, in which construction activities have been stopped and are not anticipated to resume for a period of 21 days, but not longer than three months shall be temporarily mulched, within five days of stoppage of construction in accordance with Paragraph 3.04.

3.02 INSTALLATION

A. Silt Fence Installation

1. Silt fences shall be positioned as specified indicated on the Drawings and as necessary to prevent movement of sediment produced by construction activities outside of the limits of construction.
2. Dig trench approximately 6-in wide and 6-in deep along proposed fence lines.
3. Drive metal-stakes, 6 feet on center (maximum) at back edge of trenches. Stakes shall be driven 1 foot (minimum) into ground.
4. Hang filter fabric on wire carrying to bottom of trench with about 4-in of fabric laid across bottom of trench. Stretch fabric fairly taut along fence length and secure with tie wires 12-in O.C. both ways.
5. Backfill trench with excavated material and tamp.
6. Install pre-fabricated silt fence according to MANUFACTURER's instructions.

B. Haybale Barrier

1. Bales shall be either wire-bound or string-tied with the bindings oriented around the sides rather than over and under the bales.
2. Bales shall be placed lengthwise in a single row with the ends of adjacent bales tightly abutting one another.
3. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After bales are staked and chinked, the excavated soil shall be backfilled against the barrier. Backfilled material shall conform to the ground level on the downhill side and shall be built up to 2 inches against the uphill side.
4. Each bale shall be securely anchored by at least two stakes or rebars driven through the bale. The first stake shall be driven toward the previously laid bale to force the bales together. Stakes shall be driven deep enough into the ground to securely anchor the bales.
5. The gaps between each bale shall be chinked (filled by wedging) with straw to prevent water from escaping between the bales.

C. Turbidity Barriers

1. Turbidity barriers should extend the entire depth of the water.
2. Turbidity barriers should not be placed perpendicular to flow. Barriers should be installed at an angle to the flow. Angle should be determined on the amount of flow in the waterway and the MANUFACTURER's recommendation.
3. Turbidity barrier should be 10 to 20 percent longer than the straight line measurement.
4. Joints between panels should be kept to a minimum.
5. Barrier should extend to the top of bank. All ends should be secured firmly to the shoreline.
6. Where significant flow is anticipated, a heavy woven pervious filter fabric may be substituted.

D. Inlet Protection

1. Inlet protection shall be installed for all catch basins, drop inlets, drop structures, inlets to drainage pipes, or other structures as indicated on plans.
2. A 5-foot strip of sod shall be laid surrounding the perimeter each structure.
3. A silt fence or haybale barrier shall be installed around the perimeter of the sodded area.

3.03 MAINTENANCE AND INSPECTIONS

A. Inspections

1. CONTRACTOR shall make a visual inspection of all sedimentation and erosion control devices (including turbidity barriers) daily and promptly after every rainstorm. If such inspection reveals that additional measures are needed to prevent movement of sediment to areas outside the limits of construction, CONTRACTOR shall promptly install additional devices as needed. Sediment controls in need of maintenance shall be repaired promptly.
2. CONTRACTOR shall keep a log of all inspections indicating the following:
 - Date and time of inspection
 - Inspector
 - Amount of rainfall
 - Erosion and sediment control devices inspected
 - Condition of sediment and erosion control devices
 - Repairs needed
 - Date repair is completed

B. Device Maintenance

1. Silt Fences
 - a. Remove accumulated sediment once it builds up to one-half of the height of the fabric.
 - b. Replace damaged fabric, or patch with a 2-ft minimum overlap.
 - c. Make other repairs as necessary to ensure that the fence is filtering all runoff directed to the fence.
2. Haybale Barriers
 - a. Remove accumulated sediment once it builds up to one-half of the height of the haybales.
 - b. Replace damaged haybales.
 - c. Make other repairs as necessary to ensure that the haybales are filtering all runoff directed to the barrier.
3. Inlet Protection
 - a. Remove accumulated sediment once it builds up to one-half of the height of the barrier.
 - b. Remove all sediment accumulated within the barrier and replaced damaged sod.
 - c. Make other repair as necessary to ensure that the inlet protection device is operating properly.
4. Turbidity Barriers
 - a. Turbidity barriers shall be inspected on a daily basis.
 - b. Replace damaged fabric, or patch with a 2 foot minimum overlap.
 - c. Make other repairs as necessary to ensure barriers are effectively maintaining turbidity levels outside of the barrier within limits specified in Section 01110 and 01065.

3.04 TEMPORARY MULCHING

- A. Apply temporary mulch to areas where rough grading has been completed but final grading is not anticipated to begin within 21 days of the completion of rough grading. If construction activities are not planned to resume for three months or longer, the temporary seeding requirements shall be followed.

- B. Straw mulch shall be applied at rate of 2,000 lbs/acre and tackified with latex acrylic copolymer at a rate of 1 gal/1000 ft² diluted in a ratio of 30 parts water to 1 part latex acrylic copolymer mix.
- C. After temporary mulching, traffic should be kept to a minimum, except for designated temporary access roads.

3.05 REMOVAL AND FINAL CLEANUP

- A. Once the site has been fully stabilized against erosion, remove sediment control devices and all accumulated silt. Dispose of silt and waste materials in proper manner. Regrade all areas disturbed during this process and stabilize against erosion with surfacing materials as indicated on the Drawings or specified herein.

END OF SECTION

SECTION 02311

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The work specified in this Section includes requirements for excavation and support of temporary excavations, and trenches. When required to retain excavations in a safe manner and to control ground movements, the CONTRACTOR shall design, furnish, install, and maintain a system of steel sheeting supports, including all bracing and associated items. Upon completion of the required construction the system of support shall be removed or cut and left in place as noted herein and the excavation and staging area sites restored as discussed herein.
- B. The work specified in this Section also includes the use of portable trench boxes or sliding shields.
- C. The work shall include site grading; fencing and signing; construction staging areas; design and construction of excavation support systems; design and construction of thrust blocks; disposal of excavated material, surface water, and ground water; backfilling; and site restoration. Work shall include all labor, materials, and equipment required to complete excavation support.
- D. The CONTRACTOR shall retain the services of a professional engineer registered in the State of Florida to prepare excavation support and protection system designs and submittals described herein.
- E. All excavations and steel sheeting support system shall conform to the Florida Trench Safety Act and to applicable OSHA excavation, trenching, and shoring standards which are contained in the U.S. Code of Federal Regulations 29 (C.F.R.) 1926.650-1926.653, other federal, state or local requirements. In the event of a conflict, comply with the more restrictive applicable requirements.

1.02 DESIGN REQUIREMENTS

- A. The design of the temporary steel sheeting excavation support system is the responsibility of the CONTRACTOR. The design calculations and drawings shall be prepared, stamped and signed by a Professional Engineer registered in the State of Florida, who is experienced in designing similar excavation support systems.
- B. Design the temporary steel sheeting excavation support system in accordance with requirements of this Section. These criteria are the minimum acceptable standards.
- C. All underground utility lines shall be identified, located, and protected from damage or displacement. Utility companies and other responsible authorities shall be contacted to locate and mark the locations and, if they so desire, direct or assist with protecting the underground installation. When required, the CONTRACTOR shall obtain an excavation permit from the local authority having jurisdiction prior to the initiation of any excavation work.
- D. Design excavation support systems in accordance with all OSHA requirements and other local and agency requirements.
- E. Design the support system to minimize horizontal and vertical movements and to protect adjacent structures and utilities from damage.

- F. Excavations below the level of the base of any adjacent foundation or retaining wall shall not be permitted unless the design of the excavation and bracing includes an analysis of the stability of the structure supported by the foundation and as necessary, incorporates required bracing/underpinning of the foundation.
- G. For support systems in which bracing is installed between opposite sides of the excavation, design the excavation support of both sides to be nearly the same as feasible.
- H. Where necessary to resist point loads, pipe piles used as soldier piles shall be filled with concrete with a compressive strength not less than 3,000 psi. The strength of the concrete shall not be considered in design of the pipe pile for bending stress.
- I. Design, install, operate, and maintain ground water control system to control ground water inflows, prevent piping or loss of ground, and maintain stability of the excavation. Refer to the requirements of Section 02140.
- J. Design review and field monitoring activities by the OWNER or by the ENGINEER shall not relieve the CONTRACTOR of his/her responsibilities for the work.
- K. If sheet piles are used near any existing structures, vibration levels shall be monitored by the CONTRACTOR with seismographs.

1.03 SUBMITTALS

- A. Submit to the ENGINEER in accordance with Section 01300, Shop Drawings and design calculations for the CONTRACTOR-designed steel sheeting excavation support system stamped by a Professional Engineer in the State of Florida. Submittals shall indicate the following, as a minimum:
 - 1. Provide overall plan layout of the system, as shown on contract drawings, indicating clearances, dimensions, material properties, member sizes, locations, spacing and penetrations depth of all members, locations of various types of lateral supports. Indicate existing and proposed utilities, structures or other obstruction, location and type of instrumentation and monitoring points within the area of influence of the excavation.
 - 2. Provide wall elevations and locations of all bracing.
 - 3. Show the overall sequence of installation and removal of bracing, indicating levels to which the work will be carried out before bracing is installed or removed.
 - 4. Method of preloading bracing (if required) and the preload for each member, and the method of locking-off the preload. Include detailed drawings of the connections, jacking supports and method of shimming.
 - 5. Details, layout, arrangement, equipment requirements, and method of construction of the proposed steel sheeting excavation support system.
 - 6. Procedures for resolving difficulties arising from misalignment of members exposed during excavation, and criteria for implementing those procedures.
- B. Design calculations shall include:
 - 1. Loads on the excavation support system for all stages of excavation, bracing removal, and concrete placement, including material and equipment loads on adjacent ground during construction.
 - 2. Design of wall and all bracing members including all details for all stages of construction. Design shall account for water pressures associated with flood conditions.

- C. Submit quality control measures as required to ensure that the performance of the excavation support system is consistent with the requirements herein.
- D. For portable trench boxes or sliding shields, submittals shall include the following as a minimum:
 - 1. Trench box manufacturer's specifications, recommendations, and limitations.
 - 2. Detailed drawings showing intended use of trench box during excavation, pipe placement, and backfilling activities.
- E. Submit welder qualifications and weld procedures in accordance with AWS D1.1.
- F. Submit CONTRACTOR's and Design Engineer's qualifications as described herein.
- G. At least one copy of the design shall be maintained at the job site during excavation that includes a plan indicating the sizes, types, and configurations of the materials to be used in the protective system, and the identity of the registered engineer who approved the design.
- H. Do not proceed with any support of excavation or protection activities until the submittal has been reviewed by the ENGINEER for compliance with the Contract Documents and for general compatibility with the work and with accepted engineering practices.
- I. CONTRACTOR's Design Engineer's documentation shall include:
 - 1. Periodic on-site inspections of excavation support system as the systems are constructed.
 - 2. Review of quality control measures and performance data.
 - 3. Certification that the excavation support system is constructed per the applicable design following completion of each support system and following any modifications by CONTRACTOR during construction.

1.04 QUALITY ASSURANCE

- A. Regulations: Perform all work in accordance with current applicable regulations and codes of all Federal, State and local agencies.
- B. The CONTRACTOR shall have at least 5 years of experience with work compatible to the Work shown and specified, employing labor and supervisory personnel who are similarly experienced in this type of Work.
- C. The CONTRACTOR's Design Engineer shall be a Registered Professional Engineer in the State in which the work is located with at least 5 years professional experience in the design and construction of support of excavation systems and shall have completed not less than 5 successful excavation support projects of equal type, size, and complexity to that require for the work.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Soldier piles and structural steel members shall conform to ASTM A572 or ASTM A242 unless approved otherwise. All steel conforming to ASTM A 572 shall be Grade 36 or better. No members with permanent deformations are to be provided. Members shall not be spliced unless approved by the ENGINEER.
- B. Pipe piles used as soldier piles shall conform to ASTM A252, Grade 36, or better.

- C. Steel sheet piling shall conform to ASTM A328 or ASTM A572 or ASTM A690. All steel sheet piling conforming to ASTM A 572 shall be Grade 36 or better.
- D. Concrete shall conform to Section 03300 or ASTM C33 and ASTM C150.
- E. All timber shall be structural grade with a minimum allowable flexural strength of 1100 psi. Timber lagging shall be at least 3 inches thick and free of large or loose knots.

PART 3 - EXECUTION

3.01 GENERAL

- A. Commence installation of support system and excavations only after shop drawings have been reviewed by the ENGINEER for conformance with the contract documents and for general compatibility with the work and with accepted engineering practices.
- B. Methods of construction for excavations shall be such as to ensure the safety of the Work, CONTRACTOR's employees, ENGINEER, and OWNER's employees and inspectors, the public and adjacent property and improvements, whether public or private.
- C. Before beginning construction at any location of this project, adequately protect existing structures, utilities, trees, shrubs, and other existing facilities. The repair of or compensation for damage to existing facilities shall be at no additional cost to the OWNER.
- D. As a minimum, place fencing, gates, lights, and signs as necessary around the excavations and staging areas to provide for public safety.
- E. Install excavation support systems in accordance with the approved shop drawings and applicable permits.
- F. All voids between excavation support system and earth shall be filled with materials acceptable to the ENGINEER.
- G. If unstable material is encountered during excavation, all necessary measures shall be taken immediately to contain it in place and prevent ground displacement.
- H. If settlement or deflections of supports indicate that support system requires modification to prevent excessive movements, redesign and resubmit revised shop drawings and calculations to the ENGINEER at no additional cost to the OWNER.
- I. Sufficient quantity of material shall be maintained on site for protection of work and for use in case of accident or emergency.
- J. All welding shall conform to the applicable provisions of ANSI/AWS D1.1.

3.02 PORTABLE TRENCH BOXES

- A. Portable trench boxes or sliding trench shields may be used for the protection of workers only.
- B. Additional excavation, backfilling, and surface restoration required as the result of trench box use shall be at no additional cost to the OWNER.

- C. Trench boxes or shields shall be designed, constructed, and maintained to meet acceptable engineering and industry standards.
- D. Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.
- E. A copy of the trench box manufacturer's specifications, recommendations, and limitations shall be in written form and maintained at the job site during all excavation work.

3.03 STEEL SHEET PILING

- A. Install steel sheet piling with the minimum embedment depths as shown on the shop drawings.
- B. Drive sheeting in plumb position with each sheet pile interlocked with adjoining piles for its entire length so as to form a continuous diaphragm throughout the length of each run of wall, bearing tightly against original ground. Exercise care in driving so that interlocking members can be extracted without damaging adjacent structures or utilities. The methods of driving, cutting, and splicing shall conform to the shop drawings.
- C. Use templates or other temporary alignment facilities to maintain piling line.
- D. Prior to installation, the sheet piles shall be thoroughly cleaned and inspected for defects and for proper interlock dimensions. The CONTRACTOR shall provide a tool for checking the interlock dimensions.
- E. Each sheet pile shall have sufficient clearance in the interlocks to slide, under its own weight, into the interlock of the sheet pile previously placed.
- F. Excavation shall not be carried in advance of steel sheet piling installation.
- G. Where obstructions are anticipated, pre-excavation or pre-drilling along the sheet pile wall alignment shall be conducted at no additional cost to the OWNER. Pre-excavation and pre-drilling shall not extend below the lowest excavation level or into bearing soils for existing or future structures.
- H. Obstructions encountered before the specified embedment for piles shall be removed. Where obstructions cannot be removed, the sheet pile system shall be re-evaluated by the CONTRACTOR's Design Engineer for the resulted reduced embedment and additional toe stability measure implemented, as required or for realignment of the sheet pile wall. A submittal of the proposed measures shall be provided.
- I. Damaged piling or piling with faulty alignment shall be withdrawn and new piling driven properly in its place. The cost of such additional work shall be considered as part of the pile driving and shall be borne by the CONTRACTOR.

3.04 INTERNAL BRACING

- A. Provide internal bracing to carry maximum design load without distortion or buckling.
- B. Include web stiffeners, plates, or angles as needed to prevent rotation, crippling, or buckling of connections and points of bearing between structural steel members. Allow for eccentricities caused by field fabrication and assembly.

- C. Install and maintain all bracing support members in tight contact with each other and with the surface being supported. Wood shims shall not be used.
- D. Coordinate excavation work with installation of bracing. Excavation shall extend no more than 2 feet below any brace level prior to installation of the bracing.
- E. Use procedures that produce uniform loading of bracing member without eccentricities or overstressing and distortion of members of system.

3.05 REMOVAL OF EXCAVATION SUPPORT

- A. Removal of excavation support system shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly as to note any indication of possible failure of the remaining members or possible cave-in of the sides of the excavation.
- B. Backfilling shall progress together with the removal of support systems from excavations.
- C. Do not remove vertical support members that were installed within the zone of influence of new or existing structures or pipelines. The zone of influence is defined as a zone extending down and away from the outer edge of the structure at 1 horizontal to 1 vertical or from the centerline of the pipe. Support members installed within this zone shall be cut off at a minimum of 5 ft below finished grade and abandoned in place.
- D. No untreated wood shall remain as part of the abandoned portion of the work.
- E. Remove material of the excavation support system from the site immediately.

END OF SECTION

SECTION 02413

HORIZONTAL DIRECTIONAL DRILLING

PART 1 – GENERAL

1.01 SUMMARY

- A. The CONTRACTOR shall furnish all labor, equipment, and materials necessary to install pipelines by horizontal directional drilling (HDD) at the locations shown on the Contract Documents.
- B. The Work of this section includes all labor, machinery, construction equipment and appliances required to perform in a good workmanlike manner all directional boring and watermain installation for the subaqueous crossing as shown on the Contract Documents.
- C. The directional boring scope shall include, but not be limited to, steerable directional boring equipment, operator control cabin, mud plant, entry and exit pits, pumps, hoses, and other equipment, sheeting, location signs as required, and miscellaneous appurtenances to complete the entire Work as shown on the Contract Drawings. Directional boring operations shall be performed within the right-of-way and/or easements shown on the Contract Drawings
- D. The ENGINEER has relied upon a geotechnical investigation report for general information purposes only and the report is not part of the Contract Documents. The CONTRACTOR shall examine the site and or undertake his own soil borings prior to submitting his bid, taking into consideration all conditions that may affect his work. The OWNER and ENGINEER will not assume responsibility for variations of subsurface conditions at locations other than places shown and at the time the investigation was made. The CONTRACTOR is cautioned of the potential for inadvertent returns, depending on the water table depth at the time of drilling and the potential for loss of circulation during drilling operations.
- E. Refer to Section 00300 for the CONTRACTOR work hours.

1.02 RELATED WORK

- A. HDPE pipe and fittings are included in Section 02623
- B. Site Preparation in Section 02100
- C. Construction Constraints are included in Section 01014.

1.03 DEFINITIONS

- A. Annular Space: The space between the excavated HDD final reamed bore diameter and the product pipe or cable.
- B. Bent Sub: A section of drill pipe behind the cutting tools that is inclined at an angle at one to three degrees from the axis of the bore in the desired direction of steering. The bent sub allows steering while rotating the cutting tools.

- C. Break-Away Connection: A connection to the product pipe that will fail at a pull force less than the rated stresses that are acceptable for the product pipe.
- D. Drilling Fluid/Mud: A mixture of water, bentonite, and/or polymers continuously pumped to the drilling tools to facilitate the removal of soil cuttings, and stabilization of the bore. These fluids also cool the cutting tools and lubricate the drill pipe and product pipe string.
- E. Drill String: The total length of the drill pipe in the borehole.
- F. Drilling Tool/Bit: Any tool or system of tools which excavates at the face of a bore.
- G. Entry Pit: The location where the pilot bore initially penetrates the ground surface and where the HDD rig is positioned.
- H. Exit pit: The location where the pilot bore exists the ground surface.
- I. Horizontal Directional Drilling: A surface-launched, guided, steerable drilling system used for the trenchless installation of pipes, conduits, and cables. A pilot bore path is excavated in a shallow arc from a surface-launched drill rig. Excavation takes place with fluid assisted cutting from a drilling tool on the drill string. The pilot bore is directed by the positioning of a bent sub. Tracking of the drill string is achieved by using a downhole wireline survey tool which shall be augmented by using an energized wire grid at the surface. The bore is filled with drilling fluid/mud for stabilization, to cool the cutting tools, and to mix the cuttings into a slurry, which is circulated to the entry point where solids are removed before the drilling fluids are returned to the bore. The bore path is enlarged with subsequent reaming passes until the desired diameter is achieved. The product pipe, conduit, or cable is then pulled into the fluid-stabilized bore hole.
- J. HDD Work Plan: Written descriptions, together with sketches, profile drawings, schedules, and other documents defining CONTRACTOR's plans and procedures for horizontal directional drilling. This HDD Work Plan also includes a detailed inadvertent return and subsidence analysis and any changes proposed to the boring lengths, depths, entry/exit pit locations or angles.
- K. Inadvertent Return – Uncontrolled flow of drilling fluid/mud to the surface at a location other than the entry or exit pit. In certain conditions, this may also be known as hydrofracture or frac-out.
- L. Geotechnical Investigation (Data) Report: A report which provides the geotechnical boring locations and logs, geotechnical and environmental laboratory data results, and testing procedures. The report is provided for information purposes only and is not part of the Contract Documents.
- M. Obstruction: Any hard object lying completely or partially within the design pathway of the bore and pipe that prevents further advancement of the drill pipe, pre-reamer, reamer, and/or pipe, after all reasonable CONTRACTOR attempts to advance past the object or re-drill around the object have failed.
- N. Pilot Bore: The action of creating the first guided pass of the HDD process which is then reamed in one or more passes to the size required to allow pullback of the pipe.
- O. Pullback: The part of a horizontal directional drilling process in which the drill pipe, swivel, and product pipe or cable is pulled back through the bore to the entry.

- P. Pullback Loads: The loads (forces) applied to a drill string and product pipe during the pullback process which also include tensile pullback loads, bending, buckling and combination loads.
- Q. Reamer: A cutting tool pushed or pulled through the borehole in order to enlarge the pilot bore hole to a diameter sufficient for the installation of the product pipe.
- R. Tracer Wire: Wire used to track the drill string, achieved by using a downhole wireline survey tool. An energized wire grid at the surface augments the tracer wire.
- S. Settlement Point: A point with elevation and spatial location established by survey prior to construction. The point is re-surveyed periodically to monitor ground movements. The point may be a nail, pin, subsurface settlement rod, borehole extensometer, or other device that can be readily located and surveyed.
- T. Work Plan: Written description, together with sketches, drawings, schedule and other documents defining Contractor's plans and procedures for HDD.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. API Bulletin 13D, 1985. Bulletin on the Rheology of Oil-Well Drilling Fluids, Second Edition, Dallas, Texas, American Petroleum Institute.
- B. API Recommended Practice 13B-1, 1990. Standard Procedures for Field Testing Water-Based Drilling Fluids, First Edition, Dallas, Texas, American Petroleum Institute.
- C. API Specifications 13A, 1993. Specification for Drilling Fluid Materials, Fifteenth Edition, Dallas, Texas. American Petroleum Institute.
- D. ASTM F1962 – 11 or Latest Edition Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings.
- E. Horizontal Directional Drilling Good Practices Guidelines, Latest Edition, HDD Industry Consortium, 300pp.
- F. IADC Drilling Manual, 1992. Eleventh Edition, Houston, Texas, International Association of Drilling Contractors.
- G. Installation of Pipelines Beneath Levees Using Horizontal Directional Drilling, US Army Corps of Engineers, Waterways Experiment Station, Final Report, CPAR-GL-98-1, April 1998.
- H. Installation of Pipelines by Horizontal Directional Drilling, Pipeline Research Committee, American Gas Association, PR-227-9424, April 1995.
- I. Pipeline Design for Installation by Horizontal Directional Drilling, ASCE Manuals and reports on Engineering Practice No. 108, 2005.
- K. Tables for Hydraulic Design of Pipes and Sewers, American Society for Civil Engineers, 5th ed., 1990.

1.05 SUBMITTALS

- A. Following is the summary of information to be included in shop drawing submittals required for the HDD Work. All submittals must be signed and sealed by a licensed Professional Engineer registered in the State of Florida.
1. Schedule
 2. Safety Plan
 3. Methods, Equipment, and Materials Description Plan
 4. Surveying Equipment and Procedures
 5. Protection of Adjacent Structures and Facilities Plan
 6. Contingency Plan for Remediation of Potential Problems
 7. Disposal of Spoils and Drilling Fluids Plan
 8. Equipment Layout Plan
 9. Inadvertent Return and Surface Spill Contingency Plan
 10. Horizontal Directional Drilling Work Plan
 11. Soil Separation Plan
 12. Maximum Allowable Drilling Fluid Pressure Calculations
 13. Pipe Filling Methods and Testing
 14. Pipe Stress Calculations
 15. Pullback Calculations
 16. Radius of Curvature Confirmation
 17. Rig Capacity Plan
 18. Contact Grouting Plan
 19. Daily logs and records
 20. As-built pilot bore profile
 21. Risk Mitigation Meetings
- B. In addition to other requirements indicated throughout this Specification, the following sections describe the above required submittals in more detail. Submittals shall be in accordance with the requirements of the Specifications, providing sufficient detail to allow the ENGINEER to judge whether or not the proposed equipment, materials, and procedures will meet the Contract requirements. The ENGINEER's review of submittal details and data will be based on considerations for the completed Work, utilities, and the possibility of necessary delays in the execution of the Work to be constructed under this Contract. Review and acceptance of the CONTRACTOR's submittals by the ENGINEER shall not be construed in any way as relieving the CONTRACTOR of its responsibilities under this Contract.
1. The CONTRACTOR shall submit all Shop Drawings to the ENGINEER. Unless otherwise noted, all Shop Drawings shall have been reviewed and accepted by the ENGINEER prior to CONTRACTOR's mobilization. All Drawings shall be legible with dimensions accurately shown and clearly marked in English.
- C. Qualifications: The CONTRACTOR shall submit written documentation of HDD superintendent and key personnel experience in accordance with Paragraph 1.07A and 1.07B.
- D. Schedule: At least fifteen (15) working days prior to mobilization for HDD operations, the CONTRACTOR shall submit a detailed schedule for the HDD installation showing all major construction activities and durations, with beginning and completion dates shown. The schedule shall be updated at least every week or more frequently, as directed by the ENGINEER, and shall include:
1. "One call" utility locate requests and visual confirmation of all crossing utilities and all parallel utilities within the vicinity of the bore centerline.
 2. Risk Mitigation Meetings (see paragraph 1.05, W for additional requirements).

3. Rig mobilization and setup.
 4. Pilot bore drilling.
 5. Pre-reaming and reaming.
 6. Layout and thermal butt-fusing of pipe.
 7. Pressure testing of pipe prior to pullback.
 8. Final reaming and pullback of pipe.
 9. Pressure testing of pipe after installation.
 10. Pig test.
 11. Cleanup, surface restoration, and demobilization.
- E. Safety Plan: The CONTRACTOR shall submit a Safety Plan, including the name of the CONTRACTOR's Site Safety Representative, emergency telephone numbers for medical facilities, and precautions for handling and disposal of any hazardous or flammable materials. The Safety Plan shall include a code of safe practices and an emergency plan in accordance with OSHA and Florida/OSHA requirements
- F. Methods, Equipment, and Materials Description Plan: The CONTRACTOR shall submit detailed description of methods, equipment, and materials to be used for the pipeline installation. Descriptions of drilling fluid additives shall be accompanied by Materials Safety Data Sheets (MSDS) and Manufacturers' descriptions and warranties. Descriptions of equipment shall include Manufacturers' specifications, calibrations, appropriate drawing, photographs, and descriptions of any modifications since manufacture. This plan shall also include the CONTRACTORs means for complying with all local noise ordinances.
- G. Surveying Equipment and Procedures: The CONTRACTOR shall submit records of equipment calibrations and certifications for all equipment used for downhole surveys and tracking of the drill head. Procedures for operating the downhole survey tools shall be described, including measures to verify the accuracy of the equipment readings. Procedures for layout of wire grid system shall be described and layout of the wire grid system shall be provided on a drawing or sketch.
- H. Protection of Adjacent Structures and Facilities Plan: The CONTRACTOR shall submit a plan that provides details on measures to be taken to monitor and protect adjacent utilities, structures, roadways and sidewalks, and provide details on monitoring equipment and provisions, including the layout of all settlement points and other monitoring points. Provide two (2) copies of pre-construction video, pre-construction survey of adjacent structures and photographs with captions to document pre-construction conditions prior to beginning HDD construction..
- I. Contingency Plan for Remediation of Potential Problems: The CONTRACTOR shall submit a Contingency Plan for Remediation of Potential Problems that may be encountered during the drilling operations. The contingency plans shall address the observations that would lead to the discovery of the problem and the methods that would be used to mitigate the problem. Potential problems that shall be addressed in this Plan include, but are not limited to, the following:
1. Loss of returns/loss of circulation of drilling fluids.
 2. Inadvertent returns/hydrofracture or surface spills resulting in drilling fluids entering water or reaching the surface. Stand-by equipment shall be provided by the CONTRACTOR to recover fluids. Turbidity barriers or other appropriate methods of containing and clean-up shall be part of the stand-by equipment to minimize dispersion in the event that drilling fluids reach the surface.
 3. Encountering obstruction during pilot bore or reaming/pullback.
 4. Drill pipe or product pipe cannot be advanced.
 5. Deviations from design line and grade exceed allowable tolerances.

6. Drill pipe or product pipe broken off in borehole.
 7. Product pipe collapse or excessive deformation.
 8. Utility strike.
 9. Deviation from planned bore path.
 10. Hydrolock occurs or is suspected.
 11. Excessive ground settlement or heave.
- J. Disposal of Spoils and Drilling Fluids Plan: The CONTRACTOR shall submit Plans for disposal of waste materials resulting from the pipeline construction, including drilling fluids, cuttings, waste oil, fuel, discharge water, etc. The CONTRACTOR shall identify the disposal site and submit a letter indicating willingness and legal authority to accept the described and anticipated waste products.
- K. Equipment Layout Plan: The CONTRACTOR shall submit a plan which provides sketches depicting the layout and locations of equipment within the rig side work area and pipe side work area, including any proposed drilling fluid containment and recirculation pits. The CONTRACTOR shall confirm that all operations shall be completely contained within the right-of-way, permanent and temporary construction easements shown on the Contract Documents.
- L. Inadvertent Return and Surface Spill Contingency Plan: An Inadvertent Return and Surface Spill Contingency Plan shall be prepared for the installation of the pipeline using HDD and the CONTRACTOR shall be capable of implementing the plan immediately should an Inadvertent Return or Surface Spill occur during the HDD work. The CONTRACTOR shall submit letter signed by an authorized representative of CONTRACTOR confirming that the Plan will be followed. If required by permit conditions, CONTRACTOR shall revise the Plan as necessary to satisfy the associated regulatory agency.
- M. Horizontal Directional Drilling Work Plan: The CONTRACTOR shall submit a HDD Work Plan complete with drawings and written description identifying details of the proposed method of construction and the sequence of operations to be performed during construction including placement, entry and exit points.
1. The Plan shall include a detailed plan and profile of the bore, showing utilities and structures and plotted at a scale no smaller than one inch equals 40 feet horizontal and one inch equals four feet vertical. Any proposed deviations from the CONTRACT DOCUMENTS shall be shown.
 2. The HDD Work Plan shall provide details of the planned bore path and the method for monitoring and controlling the speed, line, grade and rate of fluids delivery. It shall include the sequence, size, and description of each reamer and capabilities of each through anticipated geologic formation. The drill plan shall also include details on the swabbing of the borehole prior to pullback of the pipe.
- N. Soil Separation Plan: The CONTRACTOR shall submit details on the pump and soil separation plant. Include dimensions, manufacturer's specifications, pump capacity, noise rating, and soundproofing details on the system.
1. Pump capacity shall be specified for water at sea level elevation, and adjusted for actual elevation and fluid viscosity.
 2. Provide details on the generator, including dimensions, noise ratings at twenty-five (25) feet, and soundproofing. Confirm that the generator and other on-site equipment can be operated without exceeding the maximum allowable noise tolerances specified in the Contract Documents.

- O. Maximum Allowable Drilling Fluid Pressure Calculations: The CONTRACTOR shall submit calculations identifying the critical downhole pressure that would cause hydrofracture or inadvertent return of drilling fluid. The calculations shall identify the critical points in the alignment beneath the channel and near the exit point where the soil cover above the bore is low. The calculations shall identify all parameters used and state all assumptions made in the calculations. The calculations shall be signed and sealed by a licensed Professional Engineer registered in the State of Florida.
- P. Pipe Filling Methods and Testing: The CONTRACTOR shall submit methods and procedures for filling the pipe with water during pull back and] testing, See the requirements in paragraph 3.05 I.
- Q. Pipe Stress Calculations: The CONTRACTOR shall submit calculations for pipe stresses expected to result from the pullback, bending, buckling loads, earth loads, groundwater loads, and any other installation and service loads expected to be exerted on the pipe. The calculations shall identify all parameters and state all assumptions made in the calculations. All assumptions used in the calculations, including the radius of curvature, assumed drilling fluid weights, whether pipe is assumed to be filled or empty during pullback, and temperature shall be provided. These calculations shall be signed and sealed by a licensed Professional Engineer registered in the State of Florida.
- R. Pullback Calculations: The CONTRACTOR shall submit calculations for pullback loads for the conditions and operating practices anticipated. In addition to the tensile pullback loads, bending, buckling and combination loads must be considered in design. The calculations shall identify all parameters and state all assumptions made in the calculations. These calculations shall be signed and sealed by a licensed Professional Engineer registered in the State of Florida.
- S. Radius of Curvature Confirmation: The CONTRACTOR shall confirm that the bore can be completed using the radius of curvature and geometry shown on the Contract Drawings along with the calculations showing that installation stresses do not exceed allowable pipe stresses.
- T. Rig Capacity Plan: The CONTRACTOR shall submit a plan which provides details on the capacity of the drill rig verifying that the pullback capacity is greater than the required pullback calculated and submitted by the CONTRACTOR under paragraph 1.05R.
- U. Contact Grouting Plan: The CONTRACTOR shall submit descriptions of methods, equipment, and materials to be used for contact grouting any areas where over-excavation, aborted bores, voids, or cavities are created or encountered during construction.
- V. The following shall be submitted as construction progresses and at the completion of construction.
1. Daily Logs and Records: The CONTRACTOR shall submit complete, legible, written daily logs and records as specified in Paragraph 1.07C and as directed by the ENGINEER, by noon of the following day to which the records correspond.
 2. Drilling and Reaming Rates: The CONTRACTOR shall submit maximum drilling speeds and reaming rates for pilot bore and each reaming pass and confirm that the pump capacity is adequate for these anticipated drilling rates for the mud and/or drilling fluid weights and viscosities anticipated. These shall be submitted to the ENGINEER on a daily basis.
 3. Drilling Fluid Viscosity and Density (Mud Weight): The CONTRACTOR shall submit measured mud and/or drilling fluid weights used during pilot boring and reaming of the bore measured at a minimum of three times per shift or at least once per 200 feet of drilled or reamed length, whichever is more frequent, with at least two (2) hours between readings.

4. Pilot Bore As-Built Profile: The CONTRACTOR shall submit the updated pilot bore profile as drilling is underway on a daily basis and an as-built profile of the pilot bore within 24 hours of completion of the pilot bore.
5. Pulling Force Records: The CONTRACTOR shall submit the actual recorded pulling forces during pull back.
5. Pressure Test Records: The CONTRACTOR shall submit all pressure test records for both the pre-installation and post-installation tests. These shall be submitted within 24 hours of completion of such tests.
6. Variations in Plan and Profile: The CONTRACTOR shall document any variations between the actual Contract Drawings and profile of the bore path and the location shown on the Contract Drawings. The CONTRACTOR shall notify in writing and by telephone the ENGINEER immediately upon discovery of any deviations.
7. If a plan with details on how the CONTRACTOR plans to monitor and protect adjacent and/or overlying structures, buildings, roadways, sidewalks and utilities was required during the pre-construction survey phase. CONTRACTOR shall provide a post-construction survey and video of the settlement points and monitoring locations as specified in in paragraph 3.05 M.

W. Risk Mitigation Meetings: At least fifteen (15) working days prior to each major operations milestone, the CONTRACTOR and HDD superintendent shall attend a risk mitigation meeting with representatives of the ENGINEER and OWNER for the HDD crossing to discuss major operations milestones.

1. Specific risk mitigation meetings shall be held and include a discussion of the following as a minimum:
 - a. Prior to drilling of pilot-hole to discuss the following at a minimum
 - i. Traffic Control
 - ii. Rig mobilization and setup
 - iii. Pilot bore drilling
 - b. Prior to reaming to discuss the following at a minimum:
 - i. Pre-reaming and reaming.
 - ii. Layout and welding of pipe
 - c. Prior to pullback to discuss the following at a minimum:
 - i. Pressure testing of pipe prior to pullback.
 - ii. Final reaming and pullback of pipe.
 - d. Prior to testing to discuss the following at a minimum:
 - i. Pressure testing of pipe after installation
 - ii. Pig test
 - iii. Protection and monitoring of adjacent and/or overlying structures, roadways, sidewalks and utilities.

1.06 PERFORMANCE REQUIREMENTS

- A. The CONTRACTOR shall provide all equipment, materials, and personnel necessary for completing the installation as shown on the Contract Drawing and specified herein. The equipment and materials shall include but are not limited to:
 1. Directional drilling rig with all ancillary equipment, including drill pipe, drilling fluid, cutting tools, reaming bits, swivels, expanders, motors, pumps, hoses, mixing equipment, drilling fluid processing equipment (cuttings separation equipment), downhole survey equipment, energized surface grid tracking system, fluid pressure and flow rate monitoring equipment, spare parts, pipe handling equipment (cranes, backhoes, rollers, side boom tractors) control equipment, and office equipment.
 2. Drilling fluids, water, fuel, lubricant, polymers, or other additives.

3. Any other expendable or reusable materials, supplies, and equipment needed for the installation.
- B. The drilling equipment shall be capable of advancing through the geologic conditions to be encountered at the site, as described by the geotechnical investigation reports and as anticipated by the CONTRACTOR.
- C. The drilling fluid shall be designed for the geologic conditions to be encountered along the bore path, as described in the geotechnical investigation report and as anticipated by the CONTRACTOR.
- D. The drilling system shall include a fluid pump and separation plant that can achieve the rates of drilling fluid pumping, spoil separation, and slurry cleaning required by the CONTRACTOR to achieve planned production rates for the soils described in the geotechnical investigation report, and as anticipated by the CONTRACTOR. Shaker screens and hydrocyclones may be required for efficient separation of spoils. The CONTRACTOR is advised that the separation plant must fit within the allowable Work areas shown on the Contract Drawings , or in areas obtained by the CONTRACTOR with written approval from the affected property owner.
- E. All spoil and slurry must be contained in trucks, tanks, approved recirculation pits, or other containers at all times. Dumping of spoil or slurry on the ground, discharge into sewers, or discharge into the water bodies will not be permitted. All spoils will be transported and disposed of off-site at an approved disposal facility that meets all State of Florida and local requirements.
- F. Perform all Work within Work areas shown on the Contract Drawings or in areas obtained by the CONTRACTOR with written approval from the affected property owner.
- G. The pipeline shall be installed using the radii of curvatures and entry and exit angles as specified herein, unless shown otherwise on the Contract Drawings, unless deviations are approved in writing by the ENGINEER.
- H. Vertical separation from existing utilities shall be a minimum of 18-inches unless otherwise noted. Refer to contract plans for horizontal separation requirements.
- I. For sections of pipe that are fused/welded pipe rollers and lifters will be required to help the transition of the carrier pipe into the bore and to minimize the pull force. The number of pipe rollers and lifters shall be determined by the CONTRACTOR in accordance with the pipe supplier's recommendations. Location and spacing of the rollers and lifters will be done in accordance with the pipe manufacturer's recommendations based on bend radius and to protect pipe during pullback over hard or sharp surfaces. All pipe rollers and lifters will be in a condition so not to damage the pipe during construction activities.
- J. It shall be the CONTRACTOR's sole responsibility that all Work is done in conformance with all applicable federal, state, and local safety requirements. Required safety equipment and procedures shall be employed by the CONTRACTOR at all times. All materials and methods of construction shall meet the applicable requirements of the State of Florida Administrative Code.
- K. The pipe shall be certified by the CONTRACTOR as meeting all requirements of the Contract Documents. The fused/welded fabricated pipe will be pressure-tested by the CONTRACTOR prior to pullback using a low pressure air test of 3.5 to 5 pounds per square inch of pressure to check for potential leaks in accordance with the manufacturer's instructions. . All installed in

place carrier pipe will be hydrostatically pressure tested by the CONTRACTOR after installation is completed in accordance with Section 02623 as appropriate for the material installed.

- L. The CONTRACTOR shall allow access to the OWNER and/or ENGINEER and shall furnish necessary assistance and cooperation to aid the ENGINEER in observations and data and sample collection, including, but not limited to the following:
 - 1. The OWNER and/or ENGINEER shall have full access to the operator control container prior to, during, and following all HDD operations. This shall include, but not be limited to, providing visual access to real-time operator control screens, gauges, and indicators.
 - 2. The OWNER and/or ENGINEER shall have full access to the slurry separation plant prior to, during, and following all HDD operations. This shall include, but not be limited to, full access to shaker screens, hydrocyclones, conveyor belts, and slurry and spoil holding tanks. The ENGINEER shall be allowed to collect soil samples from the shaker screens and/or spoil holding tanks on the slurry separation plant a minimum of once per installed pipe section, and whenever changes in conditions are observed or suspected. If requested, the CONTRACTOR shall assist in the collection of these samples as directed by the ENGINEER.
- M. CONTRACTOR shall comply with all local noise ordinances. 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 for excessive noise shall not relieve the CONTRACTOR of the portions of this Specification including, but not limited to completion of all Work within specified Contract Time and Contract Price. The CONTRACTOR shall submit a Plan prior to construction identifying all noise reduction/abatement procedures. The Plan will be reviewed by the ENGINEER prior to construction.
 - 1. If mufflers cannot achieve the necessary noise reduction, noise abatement shall be accomplished by the CONTRACTOR's installation of baffles (or other acceptable means) positioned to break line-of-sight from the noise source to affected residences and/or commercial structures. Minimum noise abatement measures shall consist of equipping all engines with hospital grade mufflers or silencers.

1.07 QUALITY ASSURANCE

- A. CONTRACTOR Qualifications and Experience: Only CONTRACTORS that have been pre-qualified by the OWNER may perform HDD construction services on the project. Refer to Section 00300 for requirements. The CONTRACTOR shall meet the following minimum qualifications and provide information with the Bid Submittal:
 - 1. The CONTRACTOR will be required to employ skilled, experienced superintendent(s), equipment operator(s) and personnel throughout the project. The superintendent for this project shall have at least ten (10) years of successful experience using the HDD process, with at least one (1) project meeting the following criteria
 - a. The carrier pipe must be HDPE.
 - b. The carrier pipe nominal diameter of at least 12-inches.
 - c. Minimum length of 2,000 linear feet in a single pull through soil
 - d. Contractor shall provide the following for each project:
 - 1. Project Description
 - 2. Pipe Size, Length, Material, DR
 - 3. Bore Length
 - 4. Soil Types
 - 5. Owners' contact information
 - 6. Engineers contact information
 - 7. Change Orders
 - 8. Scheduled Completion Date and Actual Completion Date

2. The HDD equipment operator for this project shall have at least five (5) years of successful experience using the HDD process, with at least one (1) project meeting the criteria identified in Paragraph 1.07A.1.
- B. The CONTRACTOR shall furnish resumes of the superintendent(s) and key personnel. Personnel experience records should include project names, locations, pullback lengths, ground conditions, pipe materials, project description, project OWNER, ENGINEER, and references with names, addresses, and telephone numbers. The superintendent listed in the submittal shall be on site during all construction related activities required for the HDD installation for this project. The CONTRACTOR shall not be allowed to alter their personnel assigned to the project without prior written approval from the ENGINEER and OWNER.
 - C. Daily Logs and Records: Daily logs and records shall be maintained by the CONTRACTOR and shall include the following:
 1. Drilling lengths.
 2. Location of drill head.
 3. Drilling fluid pressures and flow rates.
 4. Drilling fluid losses.
 5. Inadvertent returns.
 6. Drilling times required for each pipe joint.
 7. Any instances of retraction and re-drilling of the pilot bore or segments thereof
 8. Any other relevant observations, including any observed settlement, heave, frac-outs, or surface spills.
 9. The downhole annular drilling fluid pressures shall be measured and recorded throughout the pilot hole drilling. These records shall be maintained and provided daily to the ENGINEER. The position of the drill head shall be continuously tracked and recorded. A plot of actual locations of the bore path shall be maintained and updated daily, or more frequently, as directed by the ENGINEER. Pason or approved equal system shall be used for on/off site monitoring. These records shall be maintained and provided daily to the ENGINEER.
 - D. Advance Notices and Inspections: The CONTRACTOR shall provide at least 72 hours advance written notice to the ENGINEER of the planned inspection of major drilling activities, including pilot bore launch, pre-reaming, reaming, and pipe pullback. The CONTRACTOR shall immediately notify the ENGINEER, in writing, when any significant problems are encountered or if ground conditions are considered by the CONTRACTOR to be materially and significantly different than those represented with the geotechnical investigation report. All Work by the CONTRACTORS shall be performed in the presence of the ENGINEER, unless ENGINEER grants prior written approval to perform such Work in ENGINEER's absence.
 - E. Surveying Equipment and Procedures: All surveying equipment used for downhole surveying and tracking of the bore path and drill head shall be inspected and calibrated by the equipment manufacturer prior to use. Proof of this inspection and calibration shall be provided to the ENGINEER prior to commencement of drilling operations as specified in Paragraph 1.05U.

PART 2 – PRODUCTS

2.01 DRILLING FLUIDS

- A. The CONTRACTOR shall select drilling fluid mixture proportions to ensure continuous circulation, bore stability, reduce drag on the pipe, and completely fill the annular space between the bore and the pipe to control settlement. Management and disposal of drilling fluids shall be the CONTRACTOR's responsibility. Drilling fluids shall not be disposed of on-site or discharged to sanitary or storm sewers, or the waterways or adjacent wetlands.

2.02 DRILL PIPE

- A. The CONTRACTOR shall provide high quality drill pipes that have been inspected and determined to be adequate for the project requirements. Bent, racked, or fatigued drill pipes shall not be used. Threads must be in good condition. The length of each drill pipe shall be measured and recorded.

2.03 PIPE

- A. The CONTRACTOR shall provide carrier pipe in accordance with Section 02623.
- B. The pipe thickness must conform to the most conservative design with respect to design calculations for the critical combination of internal and external pressure, pullback and bending. The carrier pipe shall not be greater than the dimension ratio (DR) specified in Section 02623.

2.04 WATER

- A. Refer to Section 01500 for temporary water service for construction use. Hydrants shall only be operated under the supervision of the OWNER's personnel.

2.05 CEMENT GROUT

- A. Cement grout shall consist of a mixture of 1 part cement to 6 parts sand. The amount of cement may be increased or decreased as necessary and as permitted by the ENGINEER to provide good flowing characteristics.

PART 3 – EXECUTION

3.01 GENERAL

- A. The CONTRACTOR shall provide adequate control of surface water and drilling fluids drainage and runoff, and provide silt fences, hay bales, and wattles to prevent surface water or drilling fluids from being transported off-site.
- B. The CONTRACTOR shall not initiate HDD until all submittals as specified in Paragraph 1.05 are received, reviewed, and approved by the ENGINEER.
- C. The CONTRACTOR shall not initiate HDD until all required permits are obtained. Copies of all permits shall be provided to the ENGINEER prior to construction.
- D. It is the CONTRACTOR's responsibility to provide barricades, fencing, or other safety measures to prevent public access into Work and staging areas.

3.02 PROTECTION OF UNDERGROUND UTILITIES

- A. The Contract Drawings show existing buried utilities that are believed to be near the directional drill alignment. There is no guarantee that these utilities are located as shown or that other utilities are not present. It will be the CONTRACTOR's responsibility to field locate all nearby utilities or other potential subsurface obstructions that may interfere with the Work.
- B. The CONTRACTOR shall notify "One Call" system to request marking of utilities that subscribe to One Call, and shall individually notify all other known or suspected utilities to request marking of these utilities. The CONTRACTOR shall confirm that all requested locates are made prior to commencing drilling operations. CONTRACTOR shall make all diligent efforts to locate any unmarked or abandoned utilities using all available information, maps, and drawings. The CONTRACTOR shall visually confirm and stake all existing lines, cables, or other underground facilities including exposing all crossing utilities and utilities within twenty (20) feet laterally of the centerline of designed drilled path.
- C. The CONTRACTOR shall control drilling practices to prevent damage to existing utilities and pavement.
- D. The CONTRACTOR shall make diligent effort to locate surface evidence of any other potential subsurface obstructions, such as piers and piles.
- E. The CONTRACTOR shall be responsible for all losses and repairs occasioned by damage to underground utilities, structures and pavement resulting from drilling operations.

3.03 WORK STAGING AREA

- A. Barricades, Warning Signs, and Lights: The CONTRACTOR shall, in accordance with approved Traffic and Safety Plans, erect appropriate barriers, warning lights, and signs, painted with approved colors, warnings, and graphics to ensure adequate warnings to personnel and the public.
- B. Combustible Materials: Combustible materials (fuel, oil, lubricants, etc.) shall be stored off-site or in a well-ventilated storage facility removed from the immediate vicinity of the drilling area by at least twenty (20) feet.
- C. Construction Impacts: The CONTRACTOR shall maintain the Work area in a manner that shall minimize adverse impacts on other public use activities. The CONTRACTOR shall proceed with Work in a safe, orderly manner, while maintaining the Work site free of debris and unnecessary equipment and materials.
- D. Control of Drilling Fluids: The CONTRACTOR shall follow all requirements of the Inadvertent Return and Surface Spill Contingency Plan as submitted and accepted and shall control operational pressures, drilling mud weights, drilling speeds, and any other operational factors required to avoid hydrofracture fluid losses to formations, and control drilling fluid spillage. This includes any spillages or returns at entry and exit locations or at any intermediate point. All inadvertent returns or spills shall be promptly contained and cleaned up by the CONTRACTOR. The CONTRACTOR shall maintain on-site mobile spoil removal equipment during all drilling, pre-reaming, reaming, and pullback operations and shall be capable of quickly removing spoils. The CONTRACTOR shall immediately notify ENGINEER of any inadvertent returns or spills and immediately contain and clean up the return or spill.

- E. Removal of Temporary Facilities: At the completion of construction, the CONTRACTOR shall remove all temporary facilities installed by the CONTRACTOR. Unused soil, aggregate, and other materials shall be removed and disposed of at approved sites in accordance with Federal, State, and Local regulations. Any damage to pavement, streets, lawns, common areas, and sidewalks shall be restored to original or better conditions at no additional cost to the OWNER. All grassed areas disturbed by construction shall be sodded.
- F. Site Security: The CONTRACTOR shall install an enclosure fence around the Work area. The enclosure fence shall be adequate to prevent entry of unauthorized persons. The CONTRACTOR is completely responsible for their own site security throughout the entire duration of construction.
- G. Temporary Lighting: The CONTRACTOR shall procure and maintain all temporary lighting needed for CONTRACTOR's operations, safety, testing, and inspection. Temporary lighting shall be removed immediately after completion of construction. See Section 01014 for additional requirements.
- H. Work Staging: The CONTRACTOR shall be responsible for obtaining staging areas and all necessary approvals and permits for storage of equipment and materials, parking, drilling and other Work. See Section 01014 for additional requirements.
- I. Pipe Layout Staging Areas:
 - 1 A temporary staging area for pipe layout has been acquired by the OWNER. See Section 01014 for additional requirements. The CONTRACTOR shall limit the pipe staging area for pipe layout. The CONTRACTOR shall visit the proposed areas prior to submitting a bid for this work. CONTRACTOR shall not conduct and excavation or earthwork activities in the pipe staging area without prior acceptance by the ENGINEER. CONTRACTOR is responsible for securing all necessary permits and approvals for the use of the temporary staging area layout of the pipe. All costs associated with this shall be included in the CONTRACTOR's bid price.

3.04 MOBILIZATION

- A. The CONTRACTOR shall mobilize all equipment, materials, and personnel necessary to construct the carrier pipeline using the HDD process at the locations shown in the Contract Drawings.
 - 1. Entry Area: The CONTRACTOR shall set up temporary workspace within the areas delineated on the Contract Drawings. Appropriate precautions and measures shall be employed by the CONTRACTOR to prevent erosion, surface drainage, and spillage of drilling fluids or other materials that could adversely impact the environmental quality of the site. The CONTRACTOR shall use appropriate precautions and measures to minimize erosion and contain any spillage or runoff. Shovels, brooms, buckets, and barrels shall be kept on-site to facilitate containment and cleanup. A vacuum truck or trailer unit will be on standby and capable of responding within one hour to any spill or inadvertent return incident.
 - 2. Exit Area: The exit area shall have appropriate precautions and measures for containing drilling fluids and cuttings. The CONTRACTOR shall use appropriate methods to minimize erosion and runoff. Containment and cleanup equipment shall be available to contain and clean up any surface spills and inadvertent returns.
 - 3. Pipe Layout Area: Layout area shall be free of stones, wood, debris, and obstructions. Pipe rollers shall be provided by the CONTRACTOR during the fusion process to facilitate pipe fusion and pullback. Pipe rollers and all pipe handling shall be non-abrasive and cushioned using special devices and methods to prevent damage as specified in Section 02623 and

02620. Pipe rollers that are uncushioned, unsteady or in any way pose a possibility of damaging or scratching the pipe shall not be used. The pipe lay out area may not allow the entire length to be fused in a single length before start of pull-in. CONTRACTOR will plan work accordingly. The CONTRACTOR shall maintain access to all properties unless shown otherwise on the Drawings, specified herein, or written permission has been granted by the individual property owners.

3.05 HORIZONTAL DIRECTIONAL DRILLING

- A. Drill Rig Capacity: The capacity of the directional drilling system used by the CONTRACTOR shall be adequate to install the specified pipeline.
- B. Pump Capacity: The pumps used by the CONTRACTOR shall be adequate to supply the required flow rate and pressures at the anticipated drilling fluid viscosity at all times. Drilling speeds shall not exceed pump capacity. Drilling speeds shall be monitored continuously during HDD operations.
- C. Bore Tracking and Monitoring: At all times during the pilot bore the CONTRACTOR shall provide and maintain a bore tracking system that is capable of accurately locating the position of the drill head in the x, y, and z axes. The CONTRACTOR shall record these data at least once per drill pipe length or every thirty (30), whichever is less.
 - 1. Tracking System: CONTRACTOR shall monitor and record x, y, and z coordinates relative to an established surface survey benchmark. A downhole wire line tracking locator system shall be installed and shall be supplemented by a "TruTracker" or equivalent tracking system installed between the entry point and the exit point. The coordinates of the surface wire grid system shall be surveyed and recorded. The grids shall be surveyed to establish horizontal and vertical position to 0.1 feet accuracy.
 - 2. Deviations between the recorded and design bore path shall be calculated and reported on the daily log. If the deviations exceed tolerances specified, such occurrences shall be reported immediately to the ENGINEER. The CONTRACTOR shall undertake all necessary measures to correct deviations and return to design line and grade.
 - 3. Drilling Fluid Pressures and Flow Rates: Drilling fluid pressures and flow rates shall be continuously monitored and recorded by the CONTRACTOR. The pressure shall be monitored at the pump. These measurements shall be made during pilot bore drilling, reaming, and pullback operations.
 - 4. Drilling Speeds: Maximum allowable drilling speeds shall be calculated by the CONTRACTOR for pilot boring and each reaming pass and shall not be exceeded for pilot boring or reaming passes. Measurements shall be taken every twenty (20) feet or thirty (30) minutes, whichever is more frequent.
 - 5. Drilling Fluid Viscosity and Density (Mud Weight): The CONTRACTOR shall measure and record drilling fluid viscosity and density at least three (3) times per shift or at least once per 200 feet of drilled and reamed length, whichever is more frequent with at least two (2) hours between readings, using calibrated Marsh funnel and mud balance. These measurements shall be included in daily logs submitted to the ENGINEER. The CONTRACTOR shall document modifications to the drilling fluids, by noting the types and quantities of drilling fluid additives and the dates and times when introduced. The reason for the addition of drilling fluid additives or other modifications shall be documented and reported.
- D. Location of Entry and Exit Points: Entry and exit points are shown on the Drawings. Where entry and exit points are shown, they shall be constructed in the location shown, unless otherwise approved in writing by the ENGINEER or as shown on the approved HDD Work Plan. The CONTRACTOR shall employ experienced licensed surveyors registered in the state of Florida to

locate the entry and exit points, and to establish horizontal and vertical datum for the bore and the pipe layout and assembly areas

- E. Entry and Exit Angles: Drill entrance angles shall be as shown on the Contract Drawings or unless otherwise approved in writing by the ENGINEER.
- F. Pilot Bore: The pilot bore shall follow the design path of the bore shown on the Contract Drawings. Contractor's attention is directed to the Survey Data Table on Sheet G-3 and G-4 and survey shown on the Drawings indicating the vertical and/or horizontal location of buried utilities or structures.
 - 1. Horizontal and Vertical Tolerances: Horizontal and vertical deviations shall be less than plus or minus five (5) feet from the design path centerline. The CONTRACTOR shall continuously monitor horizontal and vertical position and record the position at least once per drill pipe length, or at thirty (30) feet, whichever is less.
 - 2. Radius of Curvature: The radius of curvature shall not be less than that shown on the Contract Drawings. The radius of curvature shall be calculated over the distance of three (3) drill pipe sections.
 - 3. Entry and Exit Tolerances: The location of the entry and exit points shall be in accordance with the approved HDD Work Plan. The CONTRACTOR shall be solely responsible for all Work necessary to correct excessive deviations from line and grade, including redrilling, redesigning connections, and acquiring additional easement, at no additional cost to the OWNER and without schedule extension.
- G. Pre-reaming and Reaming: The pilot bore shall be pre-reamed and reamed using equipment and methods submitted by the CONTRACTOR. The CONTRACTOR shall completely pre-ream the bore to the final diameter prior to pullback. Multiple reams may be required to achieve the desired borehole diameter.
- H. Hydrostatic Pretest: For welded/fused pipe, the CONTRACTOR shall perform a low hydrostatic water pressure test in accordance with paragraph 1.06 K prior to pipe pullback
- I. Pipe Pullback:
 - 1. A final swabbing of the bore path prior to pullback of the carrier pipe is required. The pipe shall be installed by pulling it into the reamed bore path in a continuous operation, behind a final reaming tool selected by the CONTRACTOR.
 - 2. The pipe shall be isolated from excessive torsional and axial stresses by a swivel device.
 - 3. All measurements shall be made, recorded, and submitted on the daily logs during final reaming and pipe pullback.
 - 4. Pulling Loads: The maximum pull (axial tension force) exerted on the carrier pipeline shall be measured continuously and limited to the maximum allowed by the pipe Manufacturer so that the pipe or joints are not overstressed. A factor of safety over the maximum allowable is not required. Contractor should anticipate that the pipe will be full of water as it is pulled.
 - 5. Pipeline Support: The pipelines shall be adequately supported during installation so as to prevent overstressing or buckling. The CONTRACTOR shall provide adequate support/rollers along the stringing area to support the required length of the carrier pipe for each bore. Such support/rollers shall be spaced according to the pipe supplier, and the rollers be comprised of a non-abrasive cushioned material arranged in a manner to provide support to the bottom and bottom quarter points of the pipeline allowing for free movement of the pipeline during pullback. The pipe layout area shall be cleared of all large stones, construction debris, or other foreign objects that could damage the piping during pullback.
 - 6. The leading end of the pipe shall be closed during the pullback operation, in accordance with the pipe supplier's recommendations. A pulling head shall be used that is rated at the

allowable pull force capability of the pipe section being installed, in accordance with the pipe supplier's recommendations.

7. Each length of pipe shall be inspected and cleaned as necessary to be free of debris immediately before joining.
 8. Tracer wire will be attached to the leading end of the pipe pulling head and shall extend the full length of the installed pipe.
 9. The CONTRACTOR shall at all times handle the carrier pipe in a manner that does not overstress or otherwise damage the pipe. Vertical and horizontal curves shall be limited to manufacturer's recommended bend radius so that wall stresses do not exceed the allowable bending radius as recommended by the pipe supplier. If the pipe is buckled or otherwise damaged due to CONTRACTOR's acts or omissions, the damaged section shall be removed and replaced by the CONTRACTOR at his expense. The CONTRACTOR shall take appropriate steps during pullback to ensure that the carrier pipe and tracer wires will be installed without damage.
 10. The carrier pipe shall be filled with water as it enters the bore.
 11. The CONTRACTOR shall monitor and inspect pipe rollers and method for suspending pipe at entry during the pullback operation to avoid damage to the pipe.
 12. The CONTRACTOR shall cease operations if the pipe is damaged and shall remove the pipe from the bore and repair the pipe using the Manufacturer's recommended procedure or replace the damaged pipe before resuming installation.
 13. Damage to the pipe resulting from installation or contact grouting is the responsibility of the CONTRACTOR, including costs for replacement and labor and materials at no cost to the OWNER. Upon completion of pullback and grouting, the CONTRACTOR shall perform the following cleaning on the completed pipeline.
 - a. CONTRACTOR shall thoroughly clean the pipeline by pigging to remove all dirt stones, pieces of wood, or other material which may have entered during the construction period in accordance with Section 02623.. If after cleaning, any obstructions remain, they shall be removed at no additional cost to the OWNER.
 14. After the carrier pipe is completely pulled through the bore, a sufficient period as recommended by the pipe Manufacturer shall be provided before the final pipe tie-in.
 15. Final Hydrostatic Test: The CONTRACTOR shall conduct a final hydrostatic test of the installed pipeline. Final test shall be in accordance with Section 02623. The CONTRACTOR shall repair any defects discovered during the test, and repeat until the pipe passes the test.
 16. Disinfection and Flushing: The CONTRACTOR shall be responsible for disinfection and flushing prior to startup in accordance with AWWA C-651 and in Section 02623..
- J. Contact Grouting: The CONTRACTOR shall grout the annular space between the bore and the outer diameter of the product pipe prior to pigging described in 3.05 I of this section. Grouting shall be completed within 48 hours of completion of the final hydrostatic test. Grouting procedures shall be in accordance with approved submittals. The grouting operations shall ensure that the annulus is filled with grout for at least the first 100 feet from entry point and the last 100 feet before exit point. Grouting may be accomplished using one or more of the methods described below, or an alternative submitted by the CONTRACTOR, subject to ENGINEER' acceptance. The CONTRACTOR shall ensure that the annulus does not provide a preferential pathway for seepage regardless of the method(s) used and shall ensure that settlements shall not cause damage to existing utilities, roadways or structures.
1. Tremie pipe. Tremie pipes shall be inserted into the borehole, for at least 100 feet from both entry and exit ends after the pipe pullback is completed to grout the annular space between borehole and pipe, or any other voids created or encountered above the borehole. Tremie grout pipes shall be not less than 1-1/4 inch and not more than 2-inch diameter Schedule 40 PVC, and shall be inserted at the crown and at two locations 60 degrees from the crown.

Grout will be injected in sufficient volume to completely fill the annulus as the tremie pipes are withdrawn. Grouting pressures shall be carefully controlled and monitored to avoid applying excessive pressure to the pipe and to avoid heave or hydrofracture. The pipes shall be filled with water during grouting to counterbalance grouting pressures and to avoid excessive heat of hydration as the grout sets that could damage the pipes.

2. Mix grout into drilling fluids and inject with drilling fluid as pipe is pulled back final 100 feet to grout annulus at entry side. Grout shall be mixed into drilling fluid recirculation/distribution system and shall be injected as drilling fluid as pipe is pulled back final 100 feet. The grout mixture shall satisfy performance requirements of drilling fluid before set and requirements of annulus grout after set. Retarding agents may be incorporated into grout mixture to allow sufficient time to complete pipe pullback before initial grout set. The exit side annulus shall be grouted by inserting a tremie pipe into the bore annulus for at least 100 feet from the exit end as described in 1. above. Grout/drilling fluid injection pressures shall be less than pressures that could result in collapse of the pipe or hydrofracture of the surrounding soil.

- K. Obstructions: The CONTRACTOR shall notify the ENGINEER immediately in the event that an obstruction, such as a boulder or rock, is encountered that prevents further advancement of the drill pipe, or pullback of the pre-reamer, reamer, and/or pipe. The CONTRACTOR shall make all diligent and reasonable efforts to advance past the object by drilling slowly through the object, pulling back, and drilling along a new bore path that avoids the object, or excavating and exposing and removing the object, and all other reasonable attempts to continue the bore. The CONTRACTOR shall notify the ENGINEER of proposed measures to attempt to advance past the object, prior to initiating the attempt. If the CONTRACTOR attempts to pullback and re-drill, the CONTRACTOR shall adhere to line and grade tolerances established in this Specification section, unless the ENGINEER approves variance, in writing, prior to the CONTRACTOR's attempt to re-drill. The CONTRACTOR and ENGINEER shall investigate the cause and together determine an appropriate response. Appropriate response may include revisions to equipment or methods, retraction and re-drilling of a portion of the bore, or abandonment of the hole. If abandonment is deemed necessary, the CONTRACTOR shall recover, to the extent practicable, any drill pipe, product pipe, and tools in the bore, and properly abandon the bore by contact grouting unless otherwise directed in writing by the ENGINEER. If the bore is abandoned, the CONTRACTOR shall be allowed to begin a second attempt to install the pipeline at an alternate location subject to approval, in writing, by the ENGINEER. The CONTRACTOR shall take all reasonable actions to complete the installation with minimal delays. The extra costs and payments associated with encountering a confirmed obstruction shall be negotiated in accordance with General Conditions.
- L. Site Restoration and Demobilization: The CONTRACTOR shall remove all equipment, materials, drilling fluids, muck, waste, and debris from the site and restore the site to its original condition upon completion of the installation. Restoration and demobilization shall be completed by the CONTRACTOR within seven (7) calendar days of the completion of the pipeline installation.
- M. Settlement Monitoring: The CONTRACTOR shall visually monitor for settlement or heave before and during drilling and grouting operation at the locations shown on the plans and as determined during the pre-construction survey. The settlement monitoring locations shall be surveyed to the nearest 0.01 foot and recorded prior to drilling operations and each day drilling operations are ongoing. A final record of spot elevations shall be recorded two weeks after pipe installation is complete and presented with the record drawings. Areas found to have significantly settled or heaved will require restoration. The ENGINEER will determine what

constitutes significant settlement or heave. The CONTRACTOR will restore these areas at no cost to the OWNER.

END OF SECTION

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SECTION 02575

PAVEMENT REPAIR AND RESTORATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR will furnish all labor, materials, equipment, and incidentals required and remove and replace pavements over trenches excavated for installation of pipe lines as shown on the Drawings and/or specified herein.
- B. This Section includes restoration of existing pavements damaged by the CONTRACTOR's operations.

1.02 GENERAL

- A. Refer to Section 01390 relative to photographs required prior to construction.
- B. All damage, as a result of work under this Contract, done to existing structures, pavement, driveways, paved areas, curbs and gutters, sidewalks, shrubbery, grass, trees, utility poles, utility pipe lines, conduits, drains, catch basins, swales, ditches, signs, flagstones, or stabilized areas or driveways and including all obstructions not specifically named herein, will be repaired in a manner satisfactory to the ENGINEER. Bid prices will include the furnishing of all labor, materials, equipment, and incidentals necessary for the cutting, repair, and restoration of the damaged areas unless pay items for specific types of repair are included in the Bid Form.
- C. The CONTRACTOR will 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. The repair will conform to Florida Department of Transportation and state requirements for pavement repair and as described herein.
- D. All materials and workmanship will be first class and nothing herein will be construed as to relieve the CONTRACTOR from this responsibility. The OWNER reserves the right to require soil bearing or loading tests or materials tests, should the adequacy of the foundation or the quality of materials used be questionable. Costs of these tests will be borne by the OWNER, if found acceptable; the costs of all failed tests will be borne by the CONTRACTOR.
- E. All street and road repair will be made to the satisfaction of the OWNER. The repaired areas will, at a minimum, be similar to the original pavement and meet the approval of affected county and state agencies.

1.03 QUALITY ASSURANCE

- A. Applicable provisions of the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction," latest edition, and Supplemental Specifications hereunder govern the work under this Section. The Florida Department of Transportation will hereafter be referred to as FDOT.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All materials utilized in flexible base pavement and base course will be as specified in the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction," latest edition and applicable provisions in Section 02221 of these specifications.

PART 3 – EXECUTION

3.01 CUTTING PAVEMENT

- A. The CONTRACTOR will saw cut and remove pavement as necessary for installing the new pipelines and appurtenances and for making connections to existing pipe lines.
- B. Before removing pavement, the pavement will be marked for cuts nearly paralleling pipe lines and existing street lines. Asphalt pavement will be cut along the markings with a rotary saw.
- C. No pavement will be machine pulled until completely broken and separated along the marked cuts.
- D. The pavement adjacent to pipe line trenches will neither be disturbed nor damaged. If the adjacent pavement is disturbed or damaged, irrespective of cause, the CONTRACTOR will remove the damaged pavement and will replace it at his own expense.

3.02 GENERAL RESTORATION

- A. The restoration of all existing street paving, driveways, bike paths, etc., will be restored by the CONTRACTOR and will be replaced or rebuilt using the same type of construction as was in the original. The CONTRACTOR will be responsible for restoring all such work, including subgrade and base courses where present. The CONTRACTOR will obtain and pay for at his own expense such local or other governmental permits as may be necessary for the opening of streets and will satisfy himself as to any requirements other than those herein set forth which may affect the type, quality and manner of carrying on the restoration of surfaces by reason of jurisdiction of such governmental bodies.
- B. The CONTRACTOR will provide the permanent replacement over all residential streets, side streets and boulevards damaged during construction with 1-1/4-inch thick bituminous overlay paving over the entire roadway width no sooner than 30 calendar days after the initial bituminous pavement has been placed or at any time thereafter previous to the date of Completion of the Project, but completion will not occur until all permanent replacement of all pavement has been completed, tested and approved and satisfactory testing of the pipe line by the respective OWNER.
- C. All permanent pavement replacement will be completed by the final completion date as specified in the Contract.
- D. In all cases, the CONTRACTOR will be required to maintain, without additional compensation, all permanent replacement of street paving, done by him under this Contract until accepted by the OWNER, including the removal and replacement of such work wherever surface depressions or underlying cavities result from settlement of trench backfill.

- E. The CONTRACTOR will do all the final resurfacing or repaving of streets or roads, over the excavations that he has made and he will be responsible for relaying paving surfaces of roadbed that have failed or been damaged, at any time prior to acceptance by the OWNER on account of work done by him and he will resurface or repave over any tunnel jacking, or boring excavation that will settle or break the surface, to the satisfaction of the OWNER and at the CONTRACTOR's sole expense.
- F. All repaving or resurfacing will be done in accordance with Florida Department of Transportation Specifications.

3.03 SUBGRADE COMPACTION

- A. Subgrade compaction will be required for all roadways, parking areas and other areas to be paved as shown on the Drawings and as specified herein. Compaction will be in accordance with Section 160 of the FDOT Specifications. Minimum density of all compacted subgrade will be 95 percent of the modified proctor. The Town or their designated representative will be responsible for testing the compacted sub-grade for compliance. No base course will be started until such time as approved subgrade test results have been completed and approved by OWNER/ENGINEER. The compacted subgrade will be shaped to conform with the finished lines, grades and cross sections indicated on the contract drawings.

3.04 STABILIZED BASE COURSE

- A. A stabilized base course will be constructed on the compacted or stabilized sub-grade in conformity with the lines, grades and typical cross sections as shown on the Drawings and as specified in Section 02221.

3.05 PRIME AND TACK COATS

- A. The work will consist of the application of bituminous prime and tack coats on the previously prepared base course in accordance with Section 300 of the FDOT Specifications.

3.06 WEARING COURSE

- A. The work will consist of the construction of plant-mixed hot bituminous pavement to the thickness indicated in the Drawings conforming to Type S-1 asphaltic concrete in accordance with the FDOT Specifications.

3.07 TESTING

- A. All field testing will be performed by an independent laboratory employed by the CONTRACTOR. All materials will be tested and certified by the producer. Tests repeated because subgrade or base does not meet specified compaction will be at the CONTRACTOR's expense.

3.08 ADJUSTING EXISTING STRUCTURES

- A. Existing manholes, inlets, valve boxes, etc., within the limits of the proposed work, which do not conform to the finished grade of the proposed pavement or the finished grade designated on the Drawings for such structure will be cut down or extended and made to conform to the new grade. The materials and construction methods for this work will be approved by the ENGINEER.

3.09 MISCELLANEOUS RESTORATION

- A. Concrete curb or curb gutter will be restored to the existing height and cross section in full sections or lengths between joints. Concrete will be as specified on the Drawings. Grassed shoulders will be restored to match the existing sections with grass seed or sod of a type matching the existing grass.

3.10 CLEANUP

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

END OF SECTION

SECTION 02616

DUCTILE IRON PIPE AND FITTINGS

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, material, equipment and incidentals required, install, and test ductile iron pipe and fittings as shown on the drawings and as specified herein.
- B. Piping shall be located substantially as shown on the Drawings. The ENGINEER reserves the right to make such modifications in locations as may be found desirable to avoid interference between pipes, conduits, utilities or for other reasons. Pipe fitting notation is for the CONTRACTOR's convenience and does not relieve him/her from installing and jointing different or additional items where required to achieve a complete piping system.
- C. Where the word "pipe" is used it shall refer to pipe, fittings, or appurtenances unless otherwise noted.

1.02 RELATED WORK

- A. Trenching, Bedding and Backfilling for Pipe is included in Section 02221.
- B. Valves and Appurtenances are included in Section 15100

1.03 SUBMITTALS

- A. Submit to the ENGINEER, in accordance with Section 01300, shop drawings and product data for all ductile iron pipe, fittings, and accessories.
- B. Submit anticipated production and delivery schedule

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
 - 2. ASTM A194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
 - 3. ASTM C150 - Standard Specification for Portland Cement.
- B. American Water Works Association (AWWA)
 - 1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 - 2. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3-In Through 48-In for Water and Other Liquids.
 - 3. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - 4. AWWA C150 - Thickness Design of Ductile-Iron Pipe.
 - 5. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
 - 6. AWWA C153 - Ductile- Iron Compact Fittings, 3-In Through 16-In for Water and Other Liquids.

7. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. Each length of ductile iron pipe supplied for the project shall be hydrostatically tested at the point of manufacture to 500 psi for a duration of 10 seconds per AWWA C151. Testing may be performed prior to machining bell and spigot. Failure of ductile iron pipe shall be defined as any rupture of the pipe wall. Certified test results shall be furnished in duplicate to the Engineer prior to time of shipment.
- B. All ductile-iron pipe and fittings to be installed under this project shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. Furnish in duplicate to the Engineer sworn certificates of such tests and their results prior to the shipment of the pipe.
- C. All pipe and fittings to be installed under this Contract may be inspected at the plant for compliance with this Section by an independent testing laboratory selected by the OWNER at the OWNER's expense.
- D. Inspection of the pipe and fittings will also be made by the Engineer or representative of the OWNER after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the requirements specified herein, even though sample pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job.
- E. All pipe and fittings shall be permanently marked with the following information:
1. Manufacturer, date.
 2. Size, type, class, or wall thickness.
 3. Standard produced to (AWWA, ASTM, etc).

1.06 DELIVERY, STORAGE AND HANDLING

- A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe. Under no circumstances shall the pipe be dropped or skidded against each other. Slings, hooks, or pipe tongs shall be used in pipe handling.
- B. Materials, if stored, shall be kept safe from damage. The interior of all piping, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times.
- C. Pipe shall not be stacked higher than the limits recommended by its manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete. Stacking shall conform to manufacturer's recommendations.
- D. Gaskets for mechanical and push-on joints to be stored shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.

PART 2 – PRODUCTS

2.01 DUCTILE IRON PIPE, FITTINGS, AND ACCESSORIES

A. Pipe

1. Ductile iron pipe shall conform to AWWA C151 and ANSI A21.51. Pipe shall be supplied in standard lengths as much as possible.
2. Thickness design shall be per AWWA C150, except provide minimum Class 350 for piping 12-in and smaller and pipe shall be minimum Class 250 for larger than 12-in.
3. Ductile iron pipe shall be by U.S. Pipe and Foundry Company, Inc.; American Cast Iron Pipe Company or equal.

B. Unless otherwise noted on the Drawings, buried ductile iron pipe and fittings shall be mechanical joint and exposed pipe and fittings shall be flanged.

C. All pipe joints shall be restrained.

D. Mechanical Joint Pipe, Fittings, and Accessories

1. Mechanical joint pipe shall conform to AWWA C111 and AWWA C151 and shall be Pressure Class 250 minimum.
2. Gaskets shall be EPDM and shall conform to ANSI/AWWA C111/A21.11.
3. Minimum laying length for all pipe to be furnished shall be 18 feet.
4. Mechanical joint fittings shall conform to ANSI/AWWA C110/A21.10 with joints meeting the requirements of ANSI/AWWA C111/A21.11, and shall have a pressure rating of 250 psi minimum.
5. Pipe and fittings shall be furnished with glands, gaskets, bolts, and nuts in sufficient quantity for assembly of each joint.
6. Glands shall be Megalug Series 1100 by EBAA Iron, Inc., or approved equal.
7. Tee-head bolts and hex nuts shall be high-strength, low-alloy steel conforming to ANSI/AWWA C111/A21.11.
8. All mechanical joint pipe and fittings shall have cement mortar interior lining and seal coat (NSF 61 rated) per ANSI/AWWA C104/A21.4 and shall have exterior 1.0 mils asphaltic coating per AWWA C151.
9. All buried ductile iron pipe and fittings shall have a polyethylene wrap with a minimum 8 mils thickness and shall conform to ASTM specifications D-1248. Wrap for potable water main shall be blue and imprinted "POTABLE WATER MAIN".

E. Flanged Pipe, Fittings, and Appurtenances

1. Flanged pipe shall conform to AWWA C111 and AWWA C151 and shall be Special Thickness Class 53 minimum.
2. Flanged ductile iron fittings shall conform to AWWA C1110 and AWWA C111 and shall have a pressure rating of 250 psi minimum.
3. Flanges shall be ductile iron and shall be faced and drilled per ANSI/AWWA C110/A21.10 and ANSI B161.1 Class 125.
4. Pipe and fittings shall be furnished with gaskets, bolts, and nuts in a sufficient quantity for assembly of each flanged joint.
5. Gaskets shall be full face EPDM in accordance with AWWA C110.
6. Bolts, washers, and nuts shall be 316 SS conforming to ANSI/AWWA C110/A21.10 and ASTM A307. Bolts and nuts shall have heavy hex heads.

7. Flanged pipe and fittings shall have cement mortar interior lining and seal coat (NSF 61 rated) per ANSI/AWWA C104/A21.4 Flanged pipe and fittings shall be furnished with manufacturer's standard primer.
8. All buried ductile iron pipe and fittings shall have a polyethylene wrap with a minimum 8 mils thickness and shall conform to ASTM specifications D-1248. Wrap for potable water main shall be blue and imprinted "POTABLE WATER MAIN".

F. Harnessed Flanged Adaptor Couplings

1. Harnessed flanged adaptor couplings, where shown on the Drawings shall be furnished by the CONTRACTOR. Flange adaptor couplings shall be as specified below and in the piping materials sections of these specifications.
2. Flanged coupling adaptors shall be Smith-Blair Type 913 with Type 907 Restraint Plates and Rods, Dresser Style 128-W with Style 441 Tie Plates and Rods, or equal conforming to AWWA Manual M11. Tie rods and nuts shall be in accordance with AWWA Manual M11. Anchor studs will not be permitted.
3. All couplings shall be furnished with the pipe stop removed.
4. Couplings shall be provided with gaskets of a composition suitable for exposure to the liquid within the pipe.
5. All couplings shall have a sufficient number of factory installed anchor studs to meet or exceed the test pressure rating for this project.
6. Harness rods and bolts shall be low alloy high-strength carbon steel and shall be furnished by flange adaptor coupling MANUFACTURER. Size and number of harness rods shall be determined by manufacturer based on maximum pressure of 250 psi.
7. Interior and exterior ferrous metal surfaces shall have a factory applied epoxy coating. Coating shall be approved for potable water contact per NSF Standard 61.

2.02 DUCTILE IRON PIPE DESIGN

- A. Ductile iron pipe shall have a minimum tensile strength of 60,000 psi with a minimum yield strength of 42,000 psi. Design shall be done for external and internal pressures separately using the larger of the two for the net design thickness. Additional allowances shall be made for service allowance and casting tolerance per AWWA C150. The pipe classes determined for various sizes and conditions shall provide the total calculated thickness at a minimum or conform to minimum pipe class specified in Paragraph 2.01A2 above, whichever is greater.
- B. Design for the net thickness for external loading shall be taken as the greater of the following conditions:
 1. 2-1/2-ft of cover with AASHTO H-20 wheel loads, with an impact factor of 1.5.
 2. Depth from existing ground level of future proposed grade (whichever is greater) to top of pipe as shown on the Drawings, with truck load.
 3. Soil Density: 120 lbs/cu ft.
 4. Laying Conditions; AWWA C150, Type 2.
- C. Design for the net thickness shall be based upon the following design internal pressure conditions:
 1. Total internal
Pressure design: 500 psi (includes 100 psi surge allowance and 2.0 safety factor)
 2. Soil Modulus E.: 300 psi

- D. Copies of design calculations showing that the pipe meets all requirements specified herein shall be furnished to the ENGINEER for approval during shop drawing review in accordance with Section 01300. A yield strength of 42,000 psi shall be used during design calculations

PART 3 – EXECUTION

3.01 GENERAL

- A. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe or coatings. Pipe and fittings shall not be dropped. All pipe and fittings shall be examined before laying and no piece shall be installed which is found to be defective. Damage to the pipe coatings shall be repaired per MANUFACTURER's recommendations.
- B. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work and when installed or laid, shall conform to the lines and grades required.

3.02 INSTALLING DUCTILE IRON PIPE AND FITTINGS

- A. Ductile iron pipe and fittings shall be installed in accordance with requirements of AWWA C600, Section 02221, and as specified herein. A firm, even bearing throughout the length of the pipe shall be provided by digging bell holes at each joint and by tamping backfill materials at the side of the pipe to the springline per details shown on the Drawings. Blocking will not be permitted.
- B. All pipe shall be sound and clean before laying. When laying is not in progress, open ends of the pipe shall be closed by a watertight plug or other approved means. Sufficient backfill shall be placed to prevent flotation. The deflection at joints shall not exceed 75 percent of allowable deflection recommended by MANUFACTURER.
- C. All ductile iron pipe laid underground shall have a minimum of 3-ft of cover unless otherwise shown on the Drawings or as specified herein.
- D. Fittings, in addition to those shown on the Drawings shall be provided, where required, in crossing utilities which may be encountered upon opening the trench. Solid sleeve closures shall be installed at locations approved by the ENGINEER.
- E. The pipe interior shall be maintained dry and broom clean throughout the construction period.
- F. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a bell shall be beveled to conform to the manufactured spigot end. Cement lining shall be undamaged. Field cut ends shall be sealed with approved epoxy in accordance with MANUFACTURER's instructions.
- G. Jointing Ductile-Iron Pipe
 1. All pipe joints shall be made in strict accordance with MANUFACTURER's instructions and AWWA C600.
 2. Mechanical joints shall be assembled with bell ends looking ahead. To assemble the joints in the field, thoroughly clean and lubricate the joint surfaces and rubber gasket. Bolts shall be tightened to the specified torques. Under no condition shall extension wrenches or pipe over handle of ordinary ratchet wrench be used to secure greater leverage.

3. Bolts shall be tightened alternately and evenly.
 4. Joint restraints shall be installed according to pipe MANUFACTURER's instructions.
- H. All blow-offs, outlets, valves, fittings, and other appurtenances required shall be set and jointed as indicated on the Drawings in accordance with the MANUFACTURER's instructions.
- J. All polyethylene encasement shall be installed per AWWA C105.

3.03 IDENTIFICATION

- A. All buried ductile iron pipe shall be color-coded with a field-applied continuous painted stripe (minimum 2-inch wide) running along the crown of the pipe.
- B. Color shall be as follows:
1. Finished or potable water – Dark Blue

3.04 TESTING

- A. After installation, the pipe shall be tested for compliance as specified herein. Furnish all necessary equipment and labor for the pressure test and leakage test on the pipelines.
- B. Submit detailed test procedures and method for ENGINEER's review. In general, testing shall be conducted in accordance with AWWA C600.
- C. New piping shall be subjected to a hydrostatic pressure of 150 psi. This test pressure shall be maintained for a minimum of 2 hours. The leakage rate shall not exceed those indicated in AWWA C600. Provide suitable restrained bulkheads or blind flanges as required to complete the hydrostatic testing specified.
- D. All valves and valve boxes shall be properly located and installed and operable prior to testing. Bulkheads shall be provided with a sufficient number of outlets for filling and draining the line and for venting air.
- E. Hydrostatic pressure and leakage tests shall conform with Section 4 of AWWA C600. Furnish gauges, meters, pressure pumps and other equipment needed to fill the line slowly and perform the required hydrostatic pressure leakage tests.
- F. The line shall be slowly filled with water and the specified test pressure shall be maintained in the pipe for the entire test period by means of a pump furnished by the CONTRACTOR. Provide accurate means for measuring the quantity of water required to maintain this pressure. The amount of water required is a measure of the leakage.
- G. Submit plan for testing to the ENGINEER for review at least 10 days before starting the test.

3.05 CLEANING AND DISINFECTION

- A. During the course of the work, keep the pipeline clean from dirt, stones, pieces of wood, or other material. All debris shall be removed from the pipeline.

- B. Before being placed in service, all new potable water pipelines 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.
- C. 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.
- D. Discharge of chlorinated water shall comply with all Federal, State and local standards.

3.06 FIELD PAINTING

- A. All flanged ductile iron pipe and fittings shall be field painted by CONTRACTOR per Section 09902.
- B. Flanged pipe and fittings to be located below grade shall be field painted prior to installation.

3.07 THREADED TAPS

- A. CONTRACTOR shall be responsible for installing the threaded taps where shown on the drawing or required for testing and disinfection. The threaded taps shall conform to ANSI/ASME B1.20.1.

END OF SECTION

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SECTION 02622

POLYVINYL CHLORIDE (PVC) PIPE

PART 1- GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required to install and test polyvinyl chloride (PVC) pipe and fittings, complete as shown on the Drawings and as specified herein.
- B. Pipe or piping refers to all pipe, fittings, material and appurtenances required to construct PVC pipe complete, in place.

1.02 RELATED WORK

- A. Dewatering and drainage is included in section 02140.
- B. Trenching, backfilling and compacting is included in Section 02221.
- C. Sodding is included in Section 02932.

1.03 SUBMITTALS

- A. Submit, in accordance with Division 1 Specifications the name of the pipe and fitting manufacturers and a list of materials to be furnished by each manufacturer. Also, include information on local representative for each manufacturer, if product is sold through a distributor.
- B. Shop Drawings including piping layouts and schedules shall include dimensioning, fittings, types and locations of valves and appurtenances, joint details, methods and location of supports, anchorage, gasket material, grade of material and all other pertinent technical information for all items to be furnished.
- C. Prior to each shipment of pipe, certified test reports that the pipe for this Contract was manufactured and tested in accordance with the ASTM Standards specified herein shall be submitted.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - 2. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
 - 3. ASTM F1760 – Standard Specification for Co-extruded Poly (Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed-Recycled Content.
- B. National Sanitation Foundation (NSF)
 - 1. Standard No. 14 - Plastic Piping Components and Related Materials.
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. All PVC pipe and fittings of a similar type (e.g. solid wall or profile wall) shall be from a single manufacturer. The supplier shall be responsible for the provisions of all test requirements specified in ASTM D3034 as applicable.
- B. Inspections of the pipe may 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 requirements specified herein, even though sample pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job at once.

1.06 SYSTEM DESCRIPTION

- A. Contractor is responsible for compatibility between pipe materials, fittings and appurtenances.

1.07 DELIVERY, STORAGE AND HANDLING

- A. All items shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the Engineer.
- B. PVC items deteriorate in sunlight and are slightly brittle, especially at lower temperatures, so care shall be taken in loading, transporting and unloading items to prevent injury to the items. All items shall be examined before installation and no piece shall be installed which is found to be defective. Handling and installation of pipe and fittings shall be in accordance with the manufacturer's instructions, referenced standards and as specified herein.
- C. Any pipe or fitting showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work.
- D. While stored, pipe shall be adequately supported from below at not more than 3-ft intervals to prevent deformation. Pipe shall not be stacked higher than 6-ft. Pipe and fittings shall be stored in a manner which will keep them at ambient outdoor temperatures. Temporary shading as required to meet this requirement shall be provided. Simple covering of the pipe and fittings which allows temperature buildup when exposed to direct sunlight will not be permitted. Pipe covering shall be in conformance with the MANUFACTURER's recommendations.
- E. Pipe and fittings shall be stored in a manner which will keep them at ambient outdoor temperatures and out of the sunlight or delivered to the site so that no pipe is exposed to sunlight for more than 60 days. Temporary shading as required to meet this requirement shall be provided. Simple covering of the pipe and fittings which allows temperature buildup or direct or indirect sunlight will not be permitted.
- F. If any defective item is discovered after it has been installed, it shall be removed and replaced with an exact replacement item in a satisfactory manner by the Contractor, at the Contractor's own expense. All pipe and fittings shall be thoroughly cleaned before installation and the interior shall be kept clean until testing.

- G. In handling the items, use special devices and methods as required to achieve the results specified herein. No uncushioned devices shall be used in handling the item.

1.08 PROJECT/SITE REQUIREMENTS

- A. PVC pipe shall be stored in the right of way as to not disturb the flow of traffic or to block driveway or sidewalk access.

PART 2 - PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

A. Polyvinyl Chloride (PVC) Pipe:

1. PVC pipe and accessories four to twelve inches (4"-12") in diameter, where shown on the Drawings or as specified, shall meet the requirements of AWWA Specification C-900 "Polyvinyl Chloride (PVC) Pressure Pipe". Pipe shall be Class 150, meeting requirements of Dimension Ratio (DR) 18 and shall be designed with cast iron outside diameters and for a test pressure of 150 psi. Each length of pipe shall be hydrotested to four (4) times its class pressure by the MANUFACTURER in accordance with AWWA C 900. Pipe shall be listed by Underwriters Laboratories. 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 in accordance with the Uni-Bell Plastic Pipe Association Guide Specification UNI-B-3-76, and as recommended by the MANUFACTURER. Pipe shall be furnished in nominal lengths of approximately 20 feet, unless otherwise approved by the ENGINEER. Pipe and accessories shall bear the NSF mark indicating pipe size, MANUFACTURER's name, AWWA and/or ASTM Specification number, working pressure, and production code. Pipe shall be made from Class 12454-A or Class 12454-B virgin compound, as designed in ASTM D 1784.
2. PVC joints for pipe three inches (3") in diameter or less, shall be threaded or solvent welded joints where called for on the Drawings, unless otherwise approved by the ENGINEER. Teflon thread tape or liquid teflon thread lubricant shall be used on all threaded joints to serve as both a sealer and lubricant. Threaded joints should be made hand tight (hard). When the joint is hand tight a strap wrench should be used to make up one to two (1-2) additional full turns past the hand tight point. Do not use pipe wrenches or pump pliers on plastic pipe or fittings.

B. Joints:

1. The PVC line joints for below ground piping three to twenty-four inches (3"-24") in diameter shall be of the push-on type approved 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 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 75°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 D 1869. 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 and shall be approved by the MANUFACTURER.

C. Fittings:

1. All fittings for pressure mains for below ground piping of four to twenty-four inches (4"-24") in diameter shall be ductile iron with mechanical joints and shall conform to AWWA/ANSI specifications C110/A21.10 for ductile iron fittings and Section 02616, unless otherwise shown on the drawings or approved by the ENGINEER.
2. Fittings for PVC pipe three inches (3") in diameter or less, shall be threaded or solvent weld and be PVC as shown on the Drawings, or as approved by the ENGINEER. Threaded PVC fittings shall conform to ASTM Specification D 2464.
3. 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.

D. Restrained Joints:

All pressure pipe shall be restrained. Restraint for PVC water mains shall be EBAA Iron, Inc., Megalug Retainer Glands, Series 1600 and 2000 PV (4-inch through 12-inch sizes) and Series 2800 and 2000 PV (14-inch through 24-inch sizes) or equal. After installation, apply a heavy bitumastic coating to all bolts, nuts and accessories.

- E. All buried ductile iron fittings and restrained joints shall have a polyethylene wrap with a minimum 8 mils thickness and shall conform to ASTM specifications D-1248. Wrap for potable water main shall be blue and imprinted "POTABLE WATER MAIN".

2.02 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. A color sample of the PVC pipe and fittings shall be submitted to the ENGINEER for approval prior to fabrication of any pipe and accessories.
- B. All buried PVC pipe shall be color-coded as follows:
1. Finished or potable water – Blue
- C. Tracer wire shall be furnished and installed with all buried PVC piping. All pipes shall be laid with two (2) strands of insulated 12 gauge A.W.G. solid strand copper wire taped to the top of each joint of pipe with about 18-inches between each piece of tape. It is to be installed at every valve box through a 2-inch PVC pipe to 12-inches minimum above the top of the concrete slab. The 2-inch PVC pipe shall be the same length as the adjustable valve box, and the 2-inch PVC pipe shall be plugged with a 2-inch removable brass plug with recessed nut. This wire is to be continuous with splices made only by direct bury 3M brand splice kit approved by the ENGINEER. This wire is to be secured to all valves, tees and elbows and taped to top center of pipe, with taping at spacing no greater than fifty (50) feet along the center of pipe. The locator wires shall be brought up into all valve boxes with enough slack provided to extend 10 to 12 inches out of each box See paragraph 3.06 for testing requirements.
- D. Marking Tape shall be as specified and installed per Section 02221.

PART 3- EXECUTION

3.01 INSTALLING POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

- A. All water mains shall be installed in accordance with recommendations of the pipe MANUFACTURER and as specified herein.
- B. 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.
- C. All pipe and fittings shall be kept clean and shall be thoroughly cleaned before installation.
- D. 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.
- E. 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. Polyvinyl chloride pipe and fittings shall be installed in accordance with requirements of AWWA Standard Specification C600. 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 CONTRACTOR, at his own expense.
- F. 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.
- G. Under no circumstances shall the pipe or accessories be dropped into the trench.
- H. All plugs, caps, bends and other locations where unbalanced forces exist shall be anchored by restrained joints.
- I. In all cases where PVC pipe is installed, a detectable marking tape shall be located between 12 and 18 inches above the top of the pipe as specified in Section 02221.
- J. 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.
- K. Maintain a minimum finish grade cover of 36-inches, unless otherwise approved by the ENGINEER or shown on the Drawings.
- L. All polyethylene encasement shall be installed per AWWA C105.

3.02 JOINTING PVC PIPE

- A. Push on joints shall be made in strict accordance with the manufacturer's instructions. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe and the joint surfaces cleaned and lubricated. The plain end of the pipe to be entered shall then be inserted in alignment with the bell of the pipe to which it is to be joined and pushed home with a come-along or by other means. Check that the reference mark on the spigot end is flush with the end of the bell.

- B. Mechanical joints shall be made in accordance with Appendix A of ANSI/AWWA C111 and the MANUFACTURER's instructions. Thoroughly clean and lubricate the joint surfaces and rubber gasket with soapy water before assembly. Bolts shall be tightened to the specified torques using a calibrated torque wrench. Under no conditions shall extension wrenches or pipe over handle of ordinary ratchet wrench be used to secure greater leverage.

3.03 RESTRAINED JOINTS

- A. Restrained joints shall be installed for all pressure pipelines. The joint assemblies shall be made in accordance with the MANUFACTURER's recommendations. After installation, apply a heavy bitumastic coating to all bolts, nuts and accessories.

3.04 TESTING FOR PRESSURE MAINS

- 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 as specified in Section 01445 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 2-inches in diameter, pipe riser and angle globe valves shall be provided at each pipe dead-end in order to bleed air from the line. Duration of pressure test shall be at least 2 hours. The cost of these items shall be included as a part of testing.
- C. 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.

- D. 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.

3.05 CLEANING AND DISINFECTION

- A. At the conclusion of the work the CONTRACTOR shall thoroughly clean all of the new pipelines by pigging 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. Provide hoses, temporary pipes, ditches, etc., as required to dispose of flushing water without damage to adjacent properties.

- B. Disinfection and Flushing: The CONTRACTOR shall be responsible for flushing all piping and process equipment prior to startup in accordance with AWWA C-651. The CONTRACTOR shall provide any temporary systems required to complete the disinfection and flushing procedures and shall be responsible for the disposal of all produced streams. Disposal of all produced streams shall be in accordance with all applicable federal, state, and local regulations. The ultimate disposal location shall be approved by both the OWNER and the ENGINEER. Testing, sampling, and analytical requirements shall be as mandated by the applicable regulatory agencies and permit requirements. All costs of testing, sampling, and analysis shall be the Contractor's responsibility.
- C. 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 leaks. If defective pipes or joints are discovered at this time, they shall be repaired or replaced by the CONTRACTOR.

3.06 TESTING FOR TRACING WIRE

- A. At the time of pressure testing, the tracer wire shall be tested by the CONTRACTOR. If this test fails; the CONTRACTOR is responsible for repairing the tracer wire. The pressure test shall be rescheduled when the wire passes.
- B. CONTRACTOR shall perform a 12-volt DC electrical continuity test on each of the tracer wires. No more than one volt of loss per 1000 feet of mainline pipe will be acceptable. The locator wire system shall pass the 12-volt DC electrical continuity test for at least one wire prior to final acceptance of the pipeline. Any cuts or breaks in the wire shall be repaired by the CONTRACTOR at his expense. The locator wire shall be tested by the CONTRACTOR at the time of pressure testing. If this test fails, the CONTRACTOR is responsible for repairing the locator wire and the pressure test will be reschedule when the wire will pass.

END OF SECTION

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SECTION 02623

HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to install high density polyethylene (HDPE) pipe and fittings complete, tested, and ready for use, as shown on the Drawings and as specified herein.

1.02 RELATED REQUIREMENTS

- A. Testing and cleaning of pipe are included in Section 02622 and as specified herein.
- B. Dewatering and drainage are included in Section 02140.
- C. Trenching, backfilling and compaction are included in 02221.
- D. Valves and appurtenances are included in Section 15100.
- E. Horizontal Directional Drilling is specified in Section 02413.

1.03 SUBMITTALS

- A. Submit, in accordance with Section III-6.11, completely detailed working drawings and schedules of all high density polyethylene (HDPE) pipe and fittings required.
- B. Submit the name and address of pipe manufacturer.
- C. Submit complete description of method of pipe installation.
- D. Submit description of the method of testing the pipe and fittings including a complete drawing of mandrel with dimensions for each pipe size.
- E. Submit the manufacturer's recommendations for handling, storing and installing the pipe and fittings.
- F. Submit certification that the stress regression testing has been performed on the specific polyethylene resin being utilized in the manufacturing of the pipe for this contract in accordance with ASTM D2837.
- G. Prior to each shipment, submit certified test reports that the pipe and fittings for this contract were manufactured and tested in accordance with the ASTM Standards specified herein.
- H. Submit the name and qualifications of the technicians proposed to perform the heat fusion of the pipe joints.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A276 – Standard Specification for Stainless Steel Bars and Shapes.
 - 2. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - 3. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewer and Other Gravity-Flow Applications.
 - 4. ASTM D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping.
 - 5. ASTM D2657 - Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings.
 - 6. ASTM D2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
 - 7. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
 - 8. ASTM F714 - Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.
 - 9. ASTM F2164 – Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
- B. American Water Works Association (AWWA)
 - 1. AWWA C600 - Installation of Ductile Iron Water Mains and Their Appurtenances.
 - 2. AWWA C906 - Polyethylene (PE) Pressure Pipe and Fittings, 4-in Through 63-in, for Water Distribution and Transmission.
- C. American National Standards Institute (ANSI)
 - 1. ANSI B16.1 - Cast Iron Flanges and Flanged Fittings.
 - 2. ANSI B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges.
 - 3. ANSI/NSF 61- Drinking Water System Components-Health Effects
- D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 DELIVERY, STORAGE AND HANDLING

- A. The delivery, storage and handling of the pipe and fittings shall be done in accordance with the manufacturer's recommendations.
- B. Pipe shall be stored on clean, level ground to prevent any scratching or gouging of the pipe. The handling of the pipe shall be done in a manner to avoid dragging the pipe over any hard or sharp objects to avoid cutting of the pipe's exterior. Any cut or gouge deeper than 5 percent of the pipe's wall thickness shall be removed from the site.
- C. Handling of the pipe shall be done in a manner to avoid all undue stress in the pipe caused by bending of the pipe.
- D. The interior of the pipe shall be free of cuts, gouges and scratches.

1.06 QUALITY ASSURANCE

- A. All HDPE pipe and fittings shall be manufactured in strict accordance with ASTM F714 and shall be from a manufacturer who is fully experienced, reputable and qualified in the manufacture of the polyethylene pipe and fittings to be furnished. All HDPE pipe and fittings shall be supplied by a distributor who is fully experienced, reputable, and qualified with the distribution of the pipe and fittings to be furnished. The pipe shall be designed, constructed, and installed in accordance with the best practices and methods and shall comply with these specifications. All pipe and fittings shall be NSF 61 approved.
- B. All pipes under this contract shall be manufactured from a polyethylene resin that has been specifically stress regression tested to provide a product supplying a minimum Hydrostatic Design Basis (HDB) of 1600 psi, as determined in accordance with ASTM D2837.
- C. All HDPE pipe to be installed under this Contract may be inspected at the factory for compliance with this Section by an independent testing laboratory provided by the Owner. The manufacturer's cooperation shall be required in these inspections. The cost of these plant inspections of all pipe approved for this Contract will be borne by the Owner.
- D. Inspection of the pipe may 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 specified 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.

1.07 WARRANTY

- A. The pipe manufacturer shall provide a warranty against manufacturing defects of material and workmanship for a period of ten years after the final acceptance of the project by the Owner. The manufacturer shall replace, at no additional cost to the Owner, any defective pipe material within the warranty period.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General
 - 1. HDPE pipe is a flexible conduit and shall be designed to transfer imposed loads to the surrounding embedment medium. The pipe and fittings shall be free from all defects including indentations, delaminations, cracks, bubbles and pinholes, which due to their nature, degree, or extent, detrimentally affect the strength and serviceability of the pipe. Any pipe or fittings with such defects which, in the judgement of the Engineer, will affect the strength and serviceability shall be repaired or rejected.
 - 2. HDPE pipe resins shall be high molecular weight, high density polyethylene with a cell classification number of 345434C (or E) or higher cell classification in accordance with ASTM D3350 and meeting Type III, Class B or Class C, Category 5, Grade P34 Per ASTM S1248; and shall be listed in the name of the pipe and fitting manufactured in PPI (Plastics Pipe Institute).

B. Pipe and Fittings

1. Pipe shall have ductile iron pipe size outside dimensions and shall be furnished in DR 9 minimum thickness.
2. All polyethylene pipes shall meet the requirements of ASTM F714. Pipe and fittings for the concentrate pipeline shall be NSF 61 approved.
3. Pipe greater than 4" shall be furnished in standard laying lengths not exceeding 50-ft.
4. Joining system: The pipe and fittings shall be joined with thermal butt fusion joints or electrofusion couplings. All joints shall be made in strict compliance with the manufacturer's recommendations and ASTM 2657.
5. HDPE fittings shall be fully pressure rated to match the pipe pressure rating. HDPE fittings shall be joined using thermal butt fusion and/or electrofusion. Adhesives and solvent cements shall not be permitted.
6. Polyethylene pipe and fittings will be as manufactured by Performance Pipe; JM Eagle; CSR polypipe or equal.
7. The polyethylene compound will be suitably protected against degradation by ultraviolet light as required by ASTM D1603.

2.02 PIPE IDENTIFICATION

- A. At 5-ft intervals along the pipe, the pipe shall be marked with the name of the manufacturer, size and class (pressure and DR), and manufacturing reference to ASTM F714.
- B. A color coded blue strip(s) shall be marked along the entire length of the pipe.
- C. The HDPE pipe shall be laid with two (2) strands of insulated 12 gauge A.W.G. solid strand copper wire see Section 02622.
- D. All HDPE mains shall be marked with a detectable marking tape per Section 02221.

2.03 ADAPTORS

- A. Polyethylene flange or mechanical joint adaptors with steel stiffeners will be used for connecting polyethylene pipe to ductile iron pipe or other material. The polyethylene end or will be backed up by a ductile iron flange backup ring or gland ring conforming to ANSI B16.1 shaped as necessary to suite outside dimension of the HDPE pipe. The assemblies will be connected with Type 316 stainless steel nuts and bolts as specified in ASTM A7256 and A307.
- B. Polyethylene adaptors will be as manufactured by Orion; Integrity Fusion Products; Specified Fittings or equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All pipe and fittings shall be installed in accordance with the manufacturer's instructions and ASTM D2774.
- B. All fusion joints shall be done by a factory qualified technician as designated by the manufacturer with a minimum of five years experience with the fusion equipment to be used. Installer certification is needed from the CONTRACTOR installing thermal butt fused HDPE pipe.

- C. Joining of the pipe by heat fusion shall be done in accordance with ASTM D2657. Prior to the start of pipe installation, one test joint shall be made and tested. No joints shall be made until a successful test joint has been made.
- D. When cutting pipe is required, the cutting shall be done by machine specifically designed for the cutting of HDPE pipe. The cut shall leave a smooth cut at right angles to the axis of the pipe.
- E. Fittings shall be connected to HDPE pipe in accordance with manufacturer's recommendations.
- F. Flanged and mechanical connections shall consist of the following:
 - 1. A high density polyethylene flange adapter, made by the manufacturer from the same resin as the pipe, and fully pressure rated to match the pipe DR pressure rating, thermally butt-fused to the stub end of the pipe.
 - 2. A ductile iron or steel back-up ring conforming to ANSI B16.1 fitted to the polyethylene flange adapter and shaped as necessary to suit the outside dimension of the pipe.
 - 3. A full face neoprene gasket, conforming to ANSI B16.21.
 - 4. Corrosion resistant bolts and nuts of Type 316 stainless steel as specified in ASTM A276 and ASTM A307. Bolts shall be tightened alternatively and evenly to the manufacturer's specified torques. After installation a bitumastic coating shall be applied to bolts and nuts.

3.02 TESTING FOR TRACING WIRE

- A. See Section 02622 for testing of tracing wire.

3.03 CLEANING, TESTING AND DISINFECTION

- A. Cleaning and testing of the carrier pipe shall be in accordance with Section 02622 and in accordance with ASTM F2164. Perform hydrostatic testing of all HDPE pipelines as set forth in the following, and conduct said tests in the presence of the ENGINEER and other authorized agencies, with 48 hours advance notice provided. Provide all labor, equipment and material required for testing the pipeline upon completion of installation, pipe laying and backfilling operations, and placement of any required temporary roadway surfacing.
 - 1. Filled pipelines shall be allowed to thermally stabilize such that the 14 temperature of the water and the pipe are equal. At temperatures above 15 one hundred (100) degrees F, the ENGINEER shall be consulted regarding the need to reduce the test pressure.
 - 2. The piping shall be tested between valved sections.
 - 3. Test pipelines at 150 psi.
 - 4. Field test all HDPE pipelines for leakage in accordance with manufacturer's recommendations for the size and class of pipeline installed. Unless other procedures recommended by the manufacturer are approved by the ENGINEER, pressure test the pipeline as follows:
 - a. Fill pipeline slowly with water. Maintain flow velocity less than two (2) feet per second.
 - b. Expel air completely from the line during filling and again before applying test pressure. Expel air by means of taps at points of highest elevation.
 - c. Apply initial test pressure and allow to stand without makeup pressure for two (2) to three (3) hours, to allow for diametric expansion or pipe stretching to stabilize.
 - d. After this equilibrium period, apply the specified test pressure and turn the pump off. The final test pressure shall be held for not less than two (2) hours.
 - e. Upon completion of the test, the pressure shall be bled off from the location other than the point where the pressure is monitored. The pressure drop shall be witnessed by the ENGINEER or designee at the point where the pressure is being monitored.

5. Allowable amount of makeup water for expansion of the pipeline during the pressure test shall conform to Table III, Test Phase Make-up Amount, contained in the manual "Inspections, Test and Safety Considerations" published by the Plastics Pipe Institute, Inc.
 6. If any test of pipeline installed exceeds the amount of makeup water as allowed above, locate and repair the cause of leakage and retest the pipeline, without additional cost to the OWNER. Repair all visible leaks regardless of the amount of leakage
- B. Before the system is put into operation, the pipeline and appurtenances and any item of new construction with which the water comes in contact, shall be thoroughly sterilized in accordance with AWWA C651.

END OF SECTION

SECTION 02932

SODDING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR will furnish all labor, materials, equipment and incidentals required to prepare lawn bed and install sodding as shown on Drawings and as specified herein.
- B. Sod will be laid in all ditch areas and slopes that are steeper than 1 vertical to 3 horizontal. Sod will be pinned down for stabilization in these areas.

1.02 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related sections:
 - 1. Sediment and Erosion Control is included in Section 02270.

1.03 SUBMITTALS

- A. Provide technical data as provided in Section 01300 for shop drawings on all materials or installation procedures required under this Section.
- B. Submit as provided in Section 01720 certifications required for all sodding supplied.

PART 2 – PRODUCTS

2.01 SOD

- A. Sod will be Pensacola Bahia of firm texture having a compacted growth and good root development as approved.
- B. Sod will be certified to meet Florida State Plant Board specifications, absolutely true to varietal type and free from weeds or other objectionable vegetation, fungus, insects and disease of any kind.
- C. Before being cut and lifted the sod will have been mowed three times with the final mowing not more than a week before cutting into uniform dimensions.
- D. Sod will be harvested, delivered, and installed within a period of 72 hours.

2.02 SOIL CONDITIONERS

- A. Soil will be tested and the testing laboratory will recommend amendments, if needed, before sodding.

B. Fertilizer

1. Fertilizer will be a complete fertilizer, the elements of which are derived from organic sources. Fertilizer will be a standard product complying with state and federal fertilizer laws.
2. Percentages of nitrogen, phosphorus and potash will be based on laboratory tests on soils approved by the ENGINEER. For purpose of bidding, assume 6 percent nitrogen, 6 percent phosphorus and 6 percent potash by weight. At least 50 percent of the total nitrogen will contain no less than 3 percent water-insoluble nitrogen.
3. Fertilizer will be delivered to the site, mixed as specified, in the original unopened standard size bags showing weight, analysis and name of Manufacturer. Containers will bear the Manufacturer's guaranteed statement of analysis, or a Manufacturer's certificate of compliance covering analysis will be furnished to the ENGINEER. Store fertilizer in a weatherproof place and in such a manner that it will be kept dry and its effectiveness will not be impaired.

- C. Superphosphate will be composed of finely ground phosphate rock as commonly used for agricultural purposes containing not less than 20 percent available phosphoric acid.

PART 3 – EXECUTION

3.01 LAWN BED PREPARATION

- A. Areas to be sodded will be cleared of all rough grass, weeds and debris and the ground brought to an even grade as approved.
- B. The soil will then be thoroughly tilled to a minimum 8-in depth.
- C. Superphosphate at a rate for bidding purposes of 5 pounds per 1000 square foot, if needed, and complete fertilizer at a rate for bidding purposes of 16 pounds per 1000 square foot will be evenly distributed over entire area and cross-discd in to a depth of 4 to 6-in.
- D. The areas will then be brought to proper grade, free of sticks, stones, or other foreign matter over 1-in in diameter or dimension. The surface will conform to finish grade, less the thickness of sod, free of water-retaining depressions, the soil friable and of uniformly firm texture.

3.02 SOD HANDLING AND INSTALLATION

- A. During delivery, prior to planting and during the planting of the lawn areas, the sod panels will at all times be protected from excessive drying and unnecessary exposure of the roots to the sun. All sod will be stacked during construction and planting so as not to be damaged by sweating or excessive heat and moisture.
- B. After completion of soil conditioning as specified above, sod panels will be laid tightly together so as to make a solid sodded lawn area. On mounds and other slopes, the long dimension of the sod will be laid perpendicular to the slope. Immediately following sod laying the lawn areas will be rolled with a lawn roller customarily used for such purposes and then thoroughly watered.
- C. Bring the sod edge in a neat, clean manner to the edge of all paving and shrub areas. Top dressing with approved, clean, weed free, sand may be required at no additional cost to the OWNER if deemed necessary by the ENGINEER.

- D. On slopes greater than 3:1, sod will be laid using staggered joints and secured using staking, pegging or other approved methods. Sod will be installed with the length perpendicular to the slopes.

3.03 MAINTENANCE

- A. The CONTRACTOR will produce a dense, well established lawn. The CONTRACTOR will be responsible for the repair and resodding of all eroded or bare spots until project acceptance. Repair sodding will be accomplished as in the original work except fertilizing may be omitted.
- B. Sufficient watering will be done by the CONTRACTOR to maintain adequate moisture for optimum development of the lawn areas. Sodded areas will receive no less than 1.5-in of water per week.

3.04 REPAIRS TO LAWN AREAS DISTURBED BY CONTRACTOR'S OPERATIONS

- A. Lawn areas planted under this Contract and lawn areas outside the designated areas damaged by CONTRACTOR's operations will be repaired at once by proper sod bed preparation, fertilizing and resodding, in accordance with these specifications.

END OF SECTION

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SECTION 02999

MISCELLANEOUS WORK AND CLEANUP

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. This Section includes miscellaneous operations that are not specified in detail as separate items but can be sufficiently described as to the kind and extent of work involved. The CONTRACTOR will furnish all labor, materials, equipment and incidentals to complete the work under this Section.
- B. The work of this Section includes, but is not limited to, the following related requirements:
 - 1. Cooperation with other CONTRACTORS.
 - 2. Crossing utilities.
 - 3. Relocation of existing utilities, low pressure gas lines, telephone lines, electric lines, cable TV lines, conduits, manholes, inlets and storm drains as necessary, all as shown on the Drawings.
 - 4. Cleaning up.
 - 5. Incidental work.

1.02 SUBMITTAL OF LUMP SUM BREAKDOWN

- A. The CONTRACTOR will submit to the ENGINEER a breakdown of the lump sum bid for Miscellaneous Work and Cleanup Item in the Schedule of Values, as required in Section 01370.

1.03 WORK SPECIFIED UNDER OTHER SECTIONS

- A. All work will be completed in a workmanlike manner by competent workmen in full compliance with all applicable sections of these Specifications.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Materials required for this Section will be of at least the same type and quality as materials that are to be restored. Where possible, the CONTRACTOR will reuse existing materials that are removed and then replaced, with the exception of paving.

PART 3 – EXECUTION

3.01 COOPERATION WITH OTHER CONTRACTORS

- A. It will be necessary for the CONTRACTOR to plan his work and cooperate with other CONTRACTORS in so far as possible to prevent any interference and delay.

3.02 CROSSING UTILITIES

- A. This item will include any extra work required in crossing culverts, water courses, drains, water mains, and other utilities, including all sheeting and bracing, extra excavation and backfill, or any other work required for the crossing, whether or not shown on the Drawings.

3.03 CLEANING UP

- A. The CONTRACTOR will remove all construction material, excess excavation, buildings, equipment and other debris remaining on the job as a result of construction operations and will render the site of the work in a neat and orderly condition.

3.04 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

SECTION 03100

CONCRETE FORMWORK

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and design, install and remove formwork for cast-in-place concrete as shown on the Drawings and as specified herein.
- B. Secure to forms as required or set for embedment as required, all miscellaneous metal items, sleeves, reglets, anchor bolts, inserts and other items furnished under other Sections and required to be cast into concrete.

1.02 RELATED WORK

- A. Concrete Reinforcement is included in Section 03301.

1.03 SUBMITTALS

- A. Submit, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
 - 1. Form release agent
 - 2. Form ties
 - 3. Location and sequence of the concrete placements. Indicate locations of form joints, panel sizes and patterns. Show location of form ties on architectural surfaces.
 - 4. Review of pour sequence, form system and panel layout shall be for appearance and strength of the completed structure only. Approval by the Engineer of forming plans or procedures shall not relieve the Contractor of responsibility for the strength, safety or correctness of methods used, the adequacy of equipment, or from carrying out the work in full compliance with the requirements of the Drawings and as specified herein.

1.04 REFERENCE STANDARDS

- A. American Concrete Institute (ACI)
 - 1. ACI 301 - Standard Specification for Structural Concrete
 - 2. ACI 318 - Building Code Requirements for Structural Concrete
 - 3. ACI 347 - Formwork for Concrete
- B. American Plywood Association (APA)
 - 1. Material grades and designations as specified

- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 SYSTEM DESCRIPTION

- A. General: Architectural Concrete is wall, slab, beam or column concrete which will have surfaces exposed to view in the finished work.
- B. Structural design responsibility: All forms and shoring shall be designed at the Contractor's expense by a professional engineer registered in the State of Florida. Formwork shall be designed and erected in accordance with the requirements of ACI 301 and ACI 318 and as recommended in ACI 347 and shall comply with all applicable regulations and codes. The design shall consider any special requirements due to the use of plasticized and/or retarded set concrete.

PART 2 PRODUCTS

2.01 GENERAL

- A. The usage of a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configurations desired.

2.02 MATERIALS

- A. Forms for cast-in-place concrete shall be made of wood, metal, or other approved material. Wood forms for the project shall be new and unused. Construct wood forms of sound lumber or plywood of suitable dimensions and free from knotholes and loose knots. Where used for exposed surfaces, dress and match boards. Sand plywood smooth and fit adjacent panels with tight joints. Metal forms may be used when approved by the Engineer and shall be of an appropriate type for the class of work involved. All forms shall be designed and constructed to provide a flat, uniform concrete surface requiring minimal finishing or repairs.
- B. Wall Forms
 - 1. Forms for all exposed exterior and interior concrete walls shall be new and unused "Plyform" exterior grade plywood panels manufactured in compliance with the APA and bearing the trademark of that group, or equal acceptable to the Engineer. Provide B grade or better veneer on all faces to be placed against concrete during forming. The class of material and grades of interior plies shall be of sufficient strength and stiffness to provide a flat, uniform concrete surface requiring minimal finishing and grinding.
 - 2. All joints or gaps in forms shall be taped, gasketed, plugged, and/or caulked with an approved material so that the joint will remain watertight and will withstand placing pressures without bulging outward or creating surface patterns.
 - 3. Forms for circular structures shall conform to the circular shape of the structure. Straight panels may be substituted for circular panels if the straight panels do not exceed 2-ft in width nor deflect more than 3-1/2 degrees per joint, nor conflict with specific notes on the Drawings.
- C. Form Release Agent

1. Coat all forming surfaces in contact with concrete using an effective, non-staining, non-residual, water based, bond-breaking form coating unless otherwise noted.
- D. Concrete surfaces which are to be painted shall be formed with hard plastic finished plywood or a similar material which does not require a form release agent unless the Contractor can substantiate to the satisfaction of the Engineer that the form release agent will not remain on the formed surface after it is stripped.
- E. Form Ties
1. Form ties encased in concrete other than those specified in the following paragraphs shall be designed so that, after removal of the projecting part, no metal shall remain within 1-1/2-in of the face of the concrete. The part of the tie to be removed shall be at least 1/2-in diameter or be provided with a wood or metal cone at least 1/2-in diameter and 1-1/2-in long. Form ties in concrete exposed to view shall be the cone-washer type.
 2. Form ties for exposed exterior and interior walls shall be as specified in the preceding paragraph except that the cones shall be of approved wood or plastic.
 3. Flat bar ties for panel forms shall have plastic or rubber inserts having a minimum depth of 1-1/2-in and sufficient dimensions to permit proper patching of the tie hole.
 4. Ties for liquid tight structures shall have an integral waterstop that is tightly welded to the tie.
 5. Common wire shall not be used for form ties.
 6. Alternate form ties consisting of tapered through-bolts at least 1-in in diameter at smallest end or through-bolts that utilize a removable tapered sleeve of the same minimum size may be used at the Contractor's option. Obtain Engineer's acceptance of system and spacing of ties prior to ordering or purchase of forming. Clean, fill and seal form tie hole with non-shrink cement grout. The Contractor shall be responsible for watertightness of the form ties and any repairs needed.

PART 3 EXECUTION

3.01 GENERAL

- A. Forms shall be used for all cast-in-place concrete including sides of footings. Forms shall be constructed and placed so that the resulting concrete will be of the shape, lines, dimensions and appearance indicated on the Drawings.
- B. Forms for walls shall have removable panels at the bottom for cleaning, inspection and joint surface preparation. Forms for walls of considerable height shall have closable intermediate inspection ports. Tremies and hoppers for placing concrete shall be used to allow concrete inspection, prevent segregation and prevent the accumulation of hardened concrete on the forms above the fresh concrete.
- C. Molding, bevels, or other types of chamfer strips shall be placed to produce blockouts, rustications, or chamfers as shown on the Drawings or as specified herein. Chamfer strips shall be provided at horizontal and vertical projecting corners to produce a 3/4-in chamfer. Rectangular or trapezoidal moldings shall be placed in locations requiring sealants where

specified or shown on the Drawings. Sizes of moldings shall conform to the sealants manufacturer's recommendations.

- D. Forms shall be sufficiently rigid to withstand construction loads and vibration and to prevent displacement or sagging between supports. Construct forms so that the concrete will not be damaged by their removal. The Contractor shall be entirely responsible for the adequacy of the forming system.
- E. Before form material is re-used, all surfaces to be in contact with concrete shall be thoroughly cleaned, all damaged places repaired, all projecting nails withdrawn and all protrusions smoothed. Reuse of wooden forms for other than rough finish will be permitted only if a "like new" condition of the form is maintained.

3.02 FORM TOLERANCES

- A. Forms shall be surfaced, designed and constructed in accordance with the recommendations of ACI 347 and shall meet the following additional requirements for the specified finishes.
- B. Formed Surface Exposed to View: Edges of all form panels in contact with concrete shall be flush within 1/32-in and forms for plane surfaces shall be such that the concrete will be plane within 1/16-in in 4-ft. Forms shall be tight to prevent the passage of mortar, water and grout. The maximum deviation of the finish wall surface at any point shall not exceed 1/4-in from the intended surface as shown on the Drawings. Form panels shall be arranged symmetrically and in an orderly manner to minimize the number of seams.
- C. Formed surfaces not exposed to view or buried shall meet requirements of Class "C" Surface in ACI 347.
- D. Formed rough surfaces including mass concrete, pipe encasement, electrical duct encasement and other similar installations shall have no minimum requirements for surface smoothness and surface deflections. The overall dimensions of the concrete shall be plus or minus 1-in.

3.03 FORM PREPARATION

- A. Wood forms in contact with the concrete shall be coated with an effective release agent prior to form installation.
- B. Steel forms shall be thoroughly cleaned and mill scale and other ferrous deposits shall be sandblasted or otherwise removed from the contact surface for all forms, except those utilized for surfaces receiving a rough finish. All forms shall have the contact surfaces coated with a release agent.

3.04 REMOVAL OF FORMS

- A. The Contractor shall be responsible for all damage resulting from removal of forms. Forms and shoring for structural slabs or beams shall remain in place in accordance with ACI 301 and ACI 347. Form removal shall conform to the requirements specified in Section 03301.

3.05 INSPECTION

- A. The Engineer shall be notified when the forms are complete and ready for inspection at least 6 hours prior to the proposed concrete placement.
- B. Failure of the forms to comply with the requirements specified herein, or to produce concrete complying with requirements of this Section shall be grounds for rejection of that portion of the concrete work. Rejected work shall be repaired or replaced as directed by the Engineer at no additional cost to the Owner. Such repair or replacement shall be subject to the requirements of this Section and approval of the Engineer.

END OF SECTION

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SECTION 03301

CONCRETE AND REINFORCING STEEL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install all concrete work complete as shown on the Drawings and as specified herein.
- B. Furnish, as required to establish concrete mixes, all sampling and laboratory testing of products and materials performed by an independent testing laboratory engaged by and at the expense of the Contractor. Provide field sampling, testing, inspection and related laboratory tests.

1.02 RELATED WORK

- A. Concrete Formwork is included in Section 03100.

1.03 SUBMITTALS

- A. Submit, in accordance with Section 01300, shop drawings and product data for:
 - 1. Placing drawings and bar bending details in conformity with the recommendations of ACI 315.
 - 2. Technical data on all materials and components.
 - 3. Material Safety Data Sheets (MSDS) for all concrete admixtures and curing agents.
 - 4. Fiber reinforcement. Submit manufacturer's data for synthetic reinforcing fibers. Identify all placements that are to contain synthetic reinforcing fibers. The fiber length and amount of fibers per cubic yard to be used for each placement shall be noted. Submit two samples of synthetic reinforcing fibers.
- B. Test Reports
 - 1. Sieve analysis, mechanical properties and deleterious substance content for fine and coarse aggregates.
 - 2. Concrete mixes: For each formulation of concrete proposed for use, submit constituent quantities per cubic yard, water cementitious ratio, concrete slump, type and manufacturer of cement. Provide either a. or b., below, for each mix proposed.
 - a. Standard deviation data for concrete mixes based on statistical records.
 - b. Water cementitious ratio curve for concrete mixes based on laboratory tests. Provide average cylinder strength test results at 7 and 28 days for laboratory concrete mix designs. Provide results of 14 day tests if available.
- C. Certifications
 - 1. Certify that admixtures used in the same concrete mix are compatible with each other and the aggregates.
 - 2. Certify that the Contractor is not associated with the independent testing laboratory proposed for use by the Contractor nor does the Contractor or officers of the Contractor's organization have a beneficial interest in the laboratory.
- D. Qualifications

1. Independent Testing Laboratory
 - a. Name and address
 - b. Names and positions of principal officers and the name, position, and qualifications of the responsible registered professional engineer in charge.
 - c. Listing of technical services to be provided. Indicate external technical services to be provided by other organizations.
 - d. Names and qualifications of the supervising laboratory technicians.
 - e. Statement of conformance provided by evaluation authority defined in ASTM C1077.
 - f. Provide report prepared by evaluation authority when requested by the Engineer.
 - g. Submit as required above for other organizations that will provide external technical services.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 1. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 2. ASTM A185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
 3. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 4. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 5. ASTM C33 - Standard Specification for Concrete Aggregates.
 6. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 7. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
 8. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete
 9. ASTM C150 - Standard Specification for Portland Cement
 10. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 11. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 12. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
 13. ASTM C311 - Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete.
 14. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
 15. ASTM C1077 – Standard Practice for Agencies Testing Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
 16. ASTM E329 – Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
 17. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
- B. American Concrete Institute (ACI).
 1. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 2. ACI 232.2R - Use of Fly Ash in Concrete
 3. ACI 301 - Specification for Structural Concrete.
 4. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
 5. ACI 305R - Hot Weather Concreting.
 6. ACI 306R - Cold Weather Concreting.
 7. ACI 315 - Details and Detailing of Concrete Reinforcement.

8. ACI 318 - Building Code Requirements for Structural Concrete.

C. Concrete Reinforcing Steel Institute (CRSI)

1. MSP - Manual of Standard Practice

D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. Comply with ACI 318 and other stated specifications, codes and standards. Apply the most stringent requirements of stated specifications, codes, standards, and this Section when conflicts exist.

B. Independent testing laboratory shall meet the requirements of ASTM E329 and ASTM C1077 and be acceptable to the Engineer. Laboratories affiliated with the Contractor or in which the Contractor or officers of the Contractor's organization have a beneficial interest are not acceptable.

C. If, during the progress of the work, it is impossible to secure concrete of the specified workability and strength with the materials being furnished, the Engineer may order such changes in proportions or materials, or both, as may be necessary to secure the specified properties. Make all changes so ordered at the no additional cost to the Owner.

D. Provide all field testing and inspection services and related laboratory tests. Methods of testing shall comply with the latest applicable ASTM methods. The following items shall be tested to verify conformity with this Section.

1. Concrete placements - compressive strength (cylinders), compressive strength (cores), temperature, slump, and air content.

2. Other materials that may require field testing.

E. Develop concrete mixes and their testing by an independent testing laboratory engaged by and at the expense of the Contractor. Methods of testing shall comply with the latest applicable ASTM methods.

F. Fiber Reinforcement. Provide services of a manufacturer's representative, with at least 2 years experience in the use of the synthetic reinforcing fibers for a preconstruction meeting and assistance during the first placement of the material.

1.06 DELIVERY, STORAGE AND HANDLING

A. Ship and store reinforcing steel with bars of the same size and shape fastened in bundles with durable tags, marked in a legible manner with waterproof markings showing the same designations as those shown on the submitted placement drawings. Provide reinforcing steel free from mill scale, loose rust, mud, dirt, grease, oil, ice or other foreign matter. Store off the ground, protect from moisture and keep free from rust, mud, dirt, grease, oil, ice or other injurious contaminants.

B. Store products in conformity with the manufacturer's recommendations.

C. Store or stockpile sand, aggregates, cement and fly ash in conformity with ACI 301.

PART 2 PRODUCTS

2.01 GENERAL

- A. The use of manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- B. Like items of materials shall be the end products of one manufacturer in order to provide standardization for appearance, maintenance and manufacturer's service.
- C. Materials shall comply with this Section and any applicable State or local requirements.

2.02 MATERIALS

- A. Fiber Reinforcement: Synthetic reinforcing fibers for concrete grout shall be 100 percent polypropylene collated, fibrillated fibers, Fibermesh 300 as manufactured by Propex Concrete Systems Corp, Chattanooga, TN, or equal. Fiber length and quantity for the concrete grout mix shall be in strict compliance with the manufacturer's recommendations as approved by the Engineer.
- B. Cement: Domestic portland cement conforming to ASTM C150. Do not use air entraining cements. The allowable types of cement for each class of concrete are shown in Table 1.
- C. Fine Aggregate: Washed inert natural sand conforming to ASTM C33.
- D. Coarse Aggregate: Well-graded crushed stone or washed gravel conforming to ASTM C33, size 67. Limits of deleterious substances and physical property requirements as listed in ASTM C33, Table 3 for severe weathering regions.
- E. Water: Potable water free of oil, acid, alkali, salts, chlorides, (except those attributable to drinking water) organic matter, or other deleterious substances.
- F. Admixtures: Use admixtures free of chlorides and alkalis (except for those attributable to drinking water). The admixtures shall be from the same manufacturer when it is required to use more than one admixture in the same concrete mix.
 - 1. Air Entraining Admixture: Conforming to ASTM C260. Proportion and mix in accordance with manufacturer's recommendations.
 - 2. Water Reducing Admixture: Conforming to ASTM C494, Type A. Proportion and mix in accordance with manufacturer's recommendations.
 - 3. Do not use admixtures causing retarded or accelerated setting of concrete without written approval from the Engineer. Use retarding or accelerating water reducing admixtures when so approved.
- G. Fly Ash: Class F fly ash complying with ASTM C618, including the requirements of Table 1 but with the Loss on Ignition (LOI) limited to 3 percent maximum and the optional physical requirements of Table 3.
- H. Deformed Concrete Reinforcing Bars: ASTM A615, Grade 60 deformed bars.
- I. Welded Steel Wire Fabric: Conforming to ASTM A185.

- J. Reinforcing Steel Accessories
1. Plastic Protected Wire Bar Supports: CRSI Bar Supports, Class 1 - Maximum Protection.
 2. Stainless Steel Protected Wire Bar Supports: CRSI Bar Supports, Class 2 - Moderate Protection with legs made wholly from stainless steel wire.
 3. Precast Concrete Bar Supports: CRSI Bar Supports, Precast Concrete Bar Supports. Precast concrete blocks that have equal or greater strength than the surrounding concrete.
- K. Tie Wires for reinforcement: 16 gauge or heavier black annealed wire.

2.03 MIXES

- A. Select proportions of ingredients to meet the design strength and materials limits specified in Table 1 and to produce placeable, durable concrete conforming to these Specifications. Proportion ingredients to produce a homogenous mixture which will readily work into corners and angles of forms and around reinforcement without permitting materials to segregate or allowing free water to collect on the surface.
- B. Base concrete mixes on standard deviation data of prior mixes with essentially the same proportions of the same constituents or, if not available, develop concrete mixes by laboratory tests using the materials proposed for the work.
- C. Compression Tests: Provide testing of the proposed concrete mix or mixes to demonstrate compliance with the compression strength requirements in conformity with the provisions of ACI 318.
- D. Entrained air, as measured by ASTM C231, shall be as shown in Table 1.
- E. Slump of the concrete as measured by ASTM C143, shall be as shown in Table 1.
- F. Proportion admixtures according to the manufacturer's recommendations. Two or more admixtures specified may be used in the same mix provided that the admixtures in combination retain full efficiency and have no deleterious effect on the concrete or on the properties of the other admixture(s).

TABLE 1

Class	Strength (1)	ASTM C150	Total Cementitious Content (pcy) (2)	Max Flyash (pcy)	W/C (3)	WR (4)	Slump Range Inches
A	2500	Type II	440	110	0.62 max.	Yes	1-4
B	5000	Type II	640	152	0.42 max.	Yes	1-4
C	300	Type II	400	300	1.0 max.	No	7-9

All concrete classes shall have 3.5 to 5 percent air entrainment.

NOTES:

- (1) Minimum compressive strength in psi at 28 days

- (2) Minimum cementitious content in lbs per cubic yard (where fly ash is used, cementitious content is defined as cement content plus fly ash content)
- (3) W/C is Maximum Water Cementitious ratio by weight
- (4) WR is water reducing admixture

2.04 MEASURING, BATCHING, MIXING AND TRANSPORTING CONCRETE

- A. Measure, batch, mix and transport concrete in conformance with ASTM C94 and the requirements herein or as otherwise approved in writing by the Engineer.
- B. Ready-mixed concrete, whether produced by a concrete supplier or the Contractor shall conform to the requirements above. Do not hand mix.
- C. Dispense admixtures into the batch in conformity with the recommendations of the admixture manufacturer.
- D. Mix concrete until there is uniform distribution of the materials and discharge completely before the mixer is recharged. The mixer shall be rotated at a speed recommended by the mixer manufacturer and mixing shall be continued for at least 1-1/2 minutes after all the materials are in the mixer. Place concrete within 1-1/2 hours of the time at which water was first added, otherwise it will be rejected. Concrete which has been remixed or retempered, or to which an excess amount of water has been added, will also be rejected.

PART 3 EXECUTION

3.01 CONSTRUCTION JOINTS

- A. Locate construction joints where indicated or where approved by the Engineer.
- B. Continue all reinforcing steel through the joint.
- C. At construction joints and at concrete joints indicated to be "roughened", uniformly roughen the surface of the concrete to a full amplitude (distance between high and low points and side to side) of 1/4-in with chipping tools to expose a fresh face. Thoroughly clean joint surfaces of loose or weakened materials by waterblasting or sandblasting and prepare for bonding. At least two hours before and again shortly before the new concrete is deposited, saturate the joints with water. After glistening water disappears, coat joints with neat cement slurry mixed to the consistency of very heavy paste. The surfaces shall receive a coating at least 1/8-in thick, scrubbed-in by means of stiff bristle brushes. Deposit new concrete before the neat cement dries.

3.02 REINFORCING STEEL

- A. All reinforcing steel shall be of domestic manufacture.
- B. Fabricate reinforcing steel accurately to the dimensions shown. Bend bars around a revolving collar having a diameter of not less than that recommended in ACI 318. All bars shall be bent cold.
- C. Provide tension lap splices in compliance with ACI 318. Stagger splices in adjacent bars where possible. Provide Class B Class 1 tension lap splices at all locations unless otherwise indicated.

- D. Lap splices in welded wire fabric in accordance with the requirements of ACI 318 but not less than 12-in. Tie the spliced fabrics together with wire ties spaced not more than 24-in on center and lace with wire of the same diameter as the welded wire fabric. Offset splices in adjacent widths to prevent continuous splices.
- E. Use precast concrete blocks where the reinforcing steel is to be supported over soil. Use plastic protected bar supports or steel supports with plastic tips where the reinforcing steel is to be supported on forms for a concrete surface that will be exposed to weather, high humidity, or liquid. Use stainless steel supports or plastic tipped metal supports in all other locations unless otherwise noted on the Drawings or specified herein.
- F. Before placing in position, clean reinforcement of loose mill scale and rust, mud, dirt, grease, oil and other coatings, including ice that reduce or destroy bond. When there is a delay in depositing concrete after the reinforcement is in place, bars shall be reinspected and cleaned again when necessary.
- G. Coat reinforcement which is to be exposed for a considerable length of time after being placed with a heavy coat of cement grout.
- H. Do not cover any reinforcing steel with concrete until the amount and position of the reinforcement has been checked and the Engineer has given permission given to proceed.

3.03 INSPECTION AND COORDINATION

- A. Batching, mixing, transporting, placing and curing of concrete shall be subject to the inspection of the Engineer at all times. Advise the Engineer of readiness to proceed at least six working hours prior to each concrete placement. The Engineer will inspect the preparations for concreting including the preparation of previously placed concrete, the reinforcing and the alignment, cleanliness and tightness of formwork. Do not place concrete without the inspection and acceptance of the Engineer.

3.04 CONCRETE APPEARANCE

- A. Remix concrete showing either poor cohesion or poor coating of the coarse aggregate with paste. If this does not correct the condition, the concrete shall be rejected.
- B. Provide concrete having a homogeneous structure which, when hardened, will have the specified strength, durability and appearance. Provide mixtures and workmanship such that concrete surfaces, when exposed, will require no finishing except as specified herein.

3.05 PLACING AND COMPACTING

- A. Do not place concrete until forms, condition of subgrade and method of placement have been approved by the Engineer. Remove all debris, foreign matter, dirt, ice and standing water from the forms before depositing concrete. Do not place concrete on frozen subgrade, snow or ice. The contact surface between concrete previously placed and new concrete shall be cleaned and brushed with cement paste. Concrete, except as indicated on the Drawings, shall not be placed in water or submerged within 24 hours after placing, nor shall running water be permitted to flow over the surface of fresh concrete within 4 days after its placing.
- B. Deposit concrete as near its final position as possible to prevent segregation due to rehandling or flowing. Pumping of concrete will be permitted when an approved design mix and

aggregate sizes suitable for pumping are used. Do not deposit concrete which has partially hardened or which has been contaminated by foreign materials. If the section cannot be placed continuously, place construction joints as specified or as approved. Place concrete for walls and columns using tremie tubes in 12-in to 24-in lifts, keeping the surface horizontal. Do not drop concrete more than 4-ft.

- C. Use high frequency mechanical vibrators to obtain proper consolidation of the concrete. Do not use vibrators to move or transport concrete in the forms. Do not over-vibrate so as to segregate. Continue vibration until the frequency returns to normal, trapped air ceases to rise and the surface appears liquefied, flattened and glistening. Use spades, rods or forks so that concrete is completely worked around reinforcement, embedded items, pipe stubs, and openings and into corners of forms.

3.06 CURING AND PROTECTION

- A. Protect all concrete work against injury from the elements and defacements of any nature during construction operations.
- B. Cure all concrete in conformance with ACI 301. Concrete that is to be used for the containment of water shall be water cured. Water curing shall be by ponding, by continuous sprinkling or by covering with continuously saturated burlap. Other concrete shall be cured by either water curing, sheet material curing or liquid membrane curing compound except that liquid membrane curing compound shall not be used on any concrete surface where additional concrete is to be placed or where the concrete surface is to be coated or painted.
- C. Protect finished surfaces and slabs from the direct rays of the sun to prevent checking and crazing.
- D. During cold weather concrete shall be batched, delivered, placed, cured and protected in compliance with the recommendations of ACI 306R. Do not use salt, manure or other chemicals for cold weather protection.
- E. During hot weather concrete shall be batched, delivered, placed, cured and protected in compliance with the recommendations of ACI 305R. The temperature of the concrete shall be such that it will cause no difficulties from loss of slump, flash set or cold joints. Immediately cover plastic concrete with sheet curing material during hot weather.

3.07 FIELD AND LABORATORY TESTS

- A. Take field control cylinder specimens during the progress of the work, in compliance with ASTM C31. The number of sets of concrete test cylinders taken of each class of concrete placed each day shall not be less than one set per day, nor less than one set for each 100 cu yds of concrete nor less than one set for each 5,000 sq ft of surface area for slabs or walls. Specimens shall be formed in 6-in diameter by 12-in long non-absorbent cylindrical molds.
 - 1. Concrete testing does not need to be performed on concrete or grout with a design compressive strength of 2500 psi or less.
 - 2. A "set" of test cylinders shall consist of five cylinders: one to be tested at seven days, one to be tested at 14 days, and two to be tested and their strengths averaged at 28 days. The fifth may be used for a special test at 3 days or to verify strength after 28 days if 28 day test results are low.
 - 3. When the average 28 day compressive strength of the cylinders in any set falls below the required compressive strength or below proportional minimum seven-day or 14-day

strengths (where proper relation between seven, 14 and 28 day strengths have been established by tests), change proportions, cementitious content, or temperature conditions to achieve the required strengths at no additional cost to the Owner.

4. Air, slump, and temperature shall be taken for every set of concrete cylinders.
- B. Provide one firmly braced, insulated, heated, closed wooden curing boxes, sized to hold ten specimens, complete with cold weather temperature and hot weather temperature control thermostat for initial curing and storage from time of fabrication until shipment to the testing lab. Protect the specimens against injury or loss through construction operations. Furnish material and labor required for the purpose of taking concrete cylinder samples. All shipping of specimens will be paid for by the Contractor.
- C. Test slump immediately prior to placing the concrete. Test shall be made in accordance with ASTM C143. When concrete is pumped, slump will be determined at point of truck discharge. If the slump is outside the specified range, the concrete will be rejected.
- D. Test for air content shall be conducted on a fresh concrete sample. Air content for concrete made of ordinary aggregates having low absorption shall be made in compliance with either the pressure method complying with ASTM C231 or by the volumetric method complying with ASTM C173. If aggregates with high absorptions are used, the latter test method shall be used. When concrete is pumped, air content will be determined at point of placement.

3.08 STRIPPING AND FINISHING CONCRETE

- A. Do not remove forms before the concrete has attained a strength of at least 30 percent of the specified design strength nor before reaching approximately "100 day-degrees" of moist curing (whichever is the longer). Degree-days are defined as the total number of 24 hour periods multiplied by the weighted average daily air temperature at the surface of the concrete (e.g., 7 days at an average 50 degrees F = 350 degree-days).
- B. Exercise care to prevent damaging edges or obliterating the lines of chamfers, rustications or corners when removing the forms or doing any other work adjacent thereto.
- C. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete, to the satisfaction of the Engineer.
- D. Immediately after removal of forms remove tie cones and metal portions of ties. Fill holes promptly upon stripping as follows: Moisten the hole with water, followed by a 1/16-in brush coat of neat cement slurry mixed to the consistency of a heavy paste. Immediately plug the hole with a 1 to 1.5 mixture of cement and concrete sand mixed slightly damp to the touch (just short of "balling"). Hammer the grout into the hole until dense, and an excess of paste appears on the surface in the form of a spider web. Trowel smooth with heavy pressure. Avoid burnishing.
- E. Defective concrete and honeycombed areas: Chip down square and at least 1-in deep to sound concrete with hand chisels or pneumatic chipping hammers. Irregular voids or surface stones need not be removed if they are sound, free of laitance, and firmly embedded in the parent concrete. If honeycomb exists around reinforcement, chip to provide a clear space at least 3/8-in wide all around the steel. For areas less than 1-1/2-in deep, the patch may be made in the same manner as described above for filling form tie holes, care being exercised to use adequately dry (non-trowelable) mixtures and to avoid sagging. Thicker repairs will require

build-up in successive 1-1/2-in layers on successive days, each layer being applied (with slurry, etc.) as described above.

- F. Concrete to receive dampproofing and concrete not exposed in the finished work shall have off-form finish with fins and other projections removed and tie cones and defects filled as specified above.
- G. Screed top surface of slabs to the established grades and to a true plane with a tolerance of 1/8-in when checked with a 10-ft straightedge. Pitch surface to drain unless otherwise noted on the Drawings. Finish the surface to give a smooth, hard, even surface free from high or low spots or other defects. Concrete subject to pedestrian traffic shall be given a broom finish. Failure to meet these conditions shall be cause for removal, grinding, or other correction as directed by the Engineer.

3.09 SCHEDULE

- A. The following (Table 2) are the general applications for the various concrete design strengths to be used:

TABLE 2

<u>Class</u>	<u>Design Strength (psi)</u>	<u>Description</u>
A	2,500	Concrete fill, grout, bollards, and electrical raceway encasement
B	5,000	Slabs on grade, walls, columns, and all other cast in place structural concrete
C	300	Flowable Fill

END OF SECTION

SECTION 03600

GROUT

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install grout complete as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Concrete and Reinforcing Steel is included in specification section 03301.

1.03 SUBMITTALS

- A. Submit, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of surface preparation, mixing and installation for:
 - 1. Commercially manufactured non-shrink cementitious. Include catalog cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations, conformity to the specified ASTM standards, and Material Safety Data Sheet.
 - 2. Concrete grout. Include data as required for concrete and for fiber reinforcement as delineated in Section 03301.
- B. Samples
 - 1. Submit samples of commercially manufactured grout products when requested by the ENGINEER.
 - 2. Submit samples of aggregates proposed for use in grout mixes when requested by the ENGINEER.
- C. Laboratory Test Reports
 - 1. For concrete grout, submit laboratory test data as required for concrete as delineated in Section 03301.
- D. Certifications
 - 1. Certify that commercially manufactured grout products and admixtures for concrete grout are made for use in contact with potable water 30 days after installation (non-toxic and free of taste and odor).
- E. Qualifications
 - 1. Submit documentation that grout manufacturers have a minimum of at least 10 years' experience in the production and use of the grouts proposed.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C33 – Standard Specification for Concrete Aggregates
 - 2. ASTM C150 – Standard Specification for Portland cement

3. ASTM C531 - Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts and Monolithic Surfacing and Polymer Concretes
4. ASTM C827 - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures
5. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
6. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
7. ASTM E329 - Standard specification for agencies engaged in the testing and/or inspection of materials used in construction

- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. Qualifications

1. Grout manufacturers shall have a minimum of 10 years' experience in the production and use of the type of grout proposed.

B. Field Testing

1. Field testing of concrete grout will be as specified for concrete in Section 03301.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the jobsite in original, unopened packages, clearly labeled with the manufacturer's name, product identification, batch numbers and printed instructions.
- B. Store materials in full compliance with the manufacturer's recommendations. Limit total storage time from date of manufacture to date of installation to six months or the manufacturer's recommended storage time, whichever is less.
- C. Remove immediately from the site material which becomes damp, contains lumps, or is hardened and replace with acceptable material at no additional cost to the OWNER.
- D. Deliver non-shrink cementitious grout as a pre-portioned blend in prepackaged mixes requiring only the addition of water.

1.07 DEFINITIONS

- A. Non-shrink Grout: A commercially manufactured product that does not shrink in either the plastic or hardened state, is dimensionally stable in the hardened state and bonds to a clean base plate.

PART 2 PRODUCTS

2.01 GENERAL

- A. The use of a manufacturer's name and product or catalog number is for the purpose of establishing the standard of quality desired.

- B. Like materials shall be the products of one manufacturer or supplier in order to provide standardization of appearance.

2.02 MATERIALS

A. Non-shrink Cementitious Grout

1. Non-shrink cementitious grouts: Conform to ASTM C1107. Grouts shall be Portland cement based, contain a pre-proportioned blend of selected aggregates and shrinkage compensating agents and require only the addition of water. Non-shrink cementitious grouts shall not contain expansive cement or metallic particles. The grouts shall exhibit no shrinkage when tested in conformity with ASTM C827.
 - a. General purpose non-shrink cementitious grout: Conform to the standards stated above. SikaGrout 212 by Sika Corp.; Set Grout by BASF Building Systems; NS Grout by The Euclid Chemical Co.; Five Star Grout by Five Star Products, Inc., or equal.
 - b. Flowable (Precision) non-shrink cementitious grout: Conform to the standards stated above. Masterflow 928 by BASF Building Systems; Hi-Flow Grout by The Euclid Chemical Co.; SikaGrout 212 by Sika Corp.; Five Star Grout by Five Star Products, Inc., or equal.

B. Concrete Grout

1. Conform to the requirements of Section 03301 except as specified herein. Proportion with Type II cement, coarse and fine aggregates, water, water reducing admixture and air entraining agent to produce a mix having a nominal strength of 2500 psi. Coarse aggregate size shall be 3/8-inch maximum. Slump shall not exceed 5-in. Minimum cement content shall be 540 lbs per cubic yard and maximum water to cement ratio shall be 0.45.
2. Add synthetic reinforcing fibers as specified in Section 03301 to the concrete grout mix at the rate of 1.5 lbs of fibers per cubic yard of grout. Add fibers from the manufacturer's pre-measured bags and according to the manufacturer's recommendations to ensure complete dispersion of the fiber bundles as single monofilaments within the concrete grout.

C. Water

1. Potable water free of oil, acid, alkali, salts, chlorides (except those attributable to drinking water), organic matter, or other deleterious substances.

PART 3 EXECUTION

3.01 PREPARATION

- A. Place grout where indicated or specified over cured concrete which has attained its specified design strength unless otherwise approved by the ENGINEER.
- B. Concrete surfaces to receive grout shall be clean and sound; free of ice, frost, dirt, dust, grease, oil, form release agent, laitance and paints and free of all loose material or foreign matter which may affect the bond or performance of the grout.
- C. Roughen concrete surfaces by chipping, sandblasting, or other dry mechanical means to bond the grout to the concrete. Remove loose or broken concrete. Irregular voids or projecting coarse aggregate need not be removed if they are sound, free of laitance and firmly embedded into the parent concrete.

1. Air compressors used to clean surfaces in contact with grout shall be the oilless type or equipped with an oil trap in the airline to prevent oil from being blown onto the surface.
- D. Remove all loose rust, oil or other deleterious substances which may affect the bond or performance of the grout from metal embedments or bottom of baseplates prior to the installation of the grout.
- E. Wash concrete surfaces clean and then keep moist for at least 24 hours prior to the placement of non-shrink cementitious or cement grout. Saturation may be achieved by covering the concrete with saturated burlap bags, use of a soaker hose, or flooding the surface. Upon completion of the 24 hour period, remove visible water from the surface prior to grouting.
- F. Provide forms for grout. Line or coat forms with release agents recommended by the grout manufacturer. Provide forms anchored in place and shored to resist the forces imposed by the grout and its placement.
 1. Forms for all grout other than concrete grout shall be designed to allow the formation of a hydraulic head and shall have chamfer strips built into forms.
- G. Level and align the structural or equipment bearing plates in accordance with the structural requirements or the recommendations of the equipment manufacturer, as applicable.
- H. Support equipment during alignment and installation of grout by shims, wedges, blocks or other approved means. The shims, wedges and blocking devices shall be prevented from bonding to the grout by bond breaking coatings and removed after grouting unless otherwise approved by the ENGINEER. Grout voids created by the removal of shims, wedges and blocks.

3.02 INSTALLATION - GENERAL

- A. Mix, apply and cure products in strict compliance with the manufacturer's recommendations and these specifications.
- B. Provide staffing and equipment available for rapid and continuous mixing and placing. Keep all necessary tools and materials ready and close at hand.
- C. Maintain temperatures of the base plate, supporting concrete, and grout between 40 and 90 degrees F during grouting and for at least 24 hours after placement, until grout compressive strength reaches 1000 psi or as recommended by the grout manufacturer, whichever is longer. Do not allow differential heating or cooling of baseplates and grout during the curing period.
- D. Take special precautions for hot weather or cold weather grouting as recommended by the manufacturer when ambient temperatures and/or the temperature of the materials in contact with the grout are outside of the 40 to 90 degrees F range.
- E. Install grout to preserve the isolation between the elements on either side of the joint where grout is placed in the vicinity of an expansion or control joint.
- F. Reflect all existing underlying expansion, control and construction joints through the grout.

3.03 INSTALLATION - NON-SHRINK CEMENTITIOUS GROUTS

- A. Mix in accordance with manufacturer's recommendations. Do not add cement, sand, pea gravel or admixtures without prior approval by the ENGINEER.

- B. Do not mix by hand. Mix in a mortar mixer with moving blades. Pre-wet the mixer and empty excess water. Add pre-measured amount of water for mixing, followed by the grout. Begin with the minimum amount of water recommended by the manufacturer and then add the minimum additional water required to obtain workability. Do not exceed the manufacturer's maximum recommended water content.
- C. Placements greater than 3-in in depth shall include the addition of clean, washed pea gravel to the grout mix when approved by the manufacturer. Comply with the manufacturer's recommendations for the size and amount of aggregate to be added.
- D. Provide forms as specified in Paragraph 3.01-F. Place grout into the designated areas and prevent segregation and entrapment of air. Do not vibrate grout to release air or to consolidate the material. Fill all spaces and provide full contact between the grout and adjoining surfaces. Provide grout holes and vent holes as necessary.
- E. Place grout rapidly and continuously to avoid cold joints. Do not place grout in layers. Do not add additional water to the mix (retemper) after initial stiffening.
- F. Just before the grout reaches its final set, cut back the grout to the substrate at a 45 degree angle from the lower edge of bearing plate unless otherwise ordered and approved by the ENGINEER. Finish this surface with a wood float or brush finish.
- G. Begin curing immediately after form removal, cutback, and finishing. Keep grout moist and within its recommended placement temperature range for at least 24 hours after placement, until grout compressive strength reaches 1000 psi or as recommended by the manufacturer, whichever is longer. Saturate the grout surface by use of saturated burlap bags, soaker hoses or ponding. Provide sunshades. If drying winds inhibit the ability of a given curing method to keep grout moist, erect wind breaks until wind is no longer a problem or curing is finished.

3.04 INSTALLATION - CONCRETE GROUT

- A. Inspect slabs finished under Section 03301 and scheduled to receive concrete grout. Scarify existing surfaces to receive concrete grout. Protect and keep the surface clean until placement of concrete grout.
- B. Remove debris and clean the surface by sweeping and vacuuming of all dirt and other foreign materials. Pressure wash the surface. Do not flush debris into tank drain lines.
- C. Saturate the concrete surface for at least 24 hours prior to placement of the concrete grout by use of saturated burlap bags, soaker hoses or ponding. Remove excess water just prior to placement of the concrete grout. Place a cement slurry immediately ahead of the concrete grout so that the slurry is moist when the grout is placed. Work the slurry over the surface with a broom until it is coated with approximately 1/16 to 1/8-in thick cement paste.
- D. Place concrete grout to final grade using the scrapers of the installed mechanical equipment as a guide for surface elevation and to eliminate high and low spots. Unless specifically approved by the equipment manufacturer, mechanical scraper mechanisms powered by their motors shall not be used as a finishing machine or screed to push grout.

3.05 SCHEDULE

- A. The following list indicates where the particular types of grout are to be used:

1. General purpose non-shrink cementitious grout: Use at all locations where non-shrink grout is indicated on the Drawings, except for base plates greater in area than 3-ft wide by 3-ft long.
2. Concrete grout: Use for overlaying the base concrete as indicated on the Drawings.

END OF SECTION

SECTION 05500

MISCELLANEOUS METAL

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install all miscellaneous metal complete as shown on the Drawings and as specified herein.

1.2 RELATED WORK

- A. Concrete and Reinforcing Steel is included in Section 03301.
- B. Equipment anchor bolts are included in Sections of 15.

1.3 SUBMITTALS

- A. Submit, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
 - 1. Shop drawings, showing sizes of members, method of assembly, anchorage and connection to other members.
- B. Samples
 - 1. Submit samples as requested by the ENGINEER during the course of construction.
- C. Design Data
 - 1. Submit calculations or test data demonstrating that the railings will resist the loads specified in the Florida Building Code and OSHA at the post spacing provided. Calculations shall be stamped by a professional engineer licensed in the State of Florida.
- D. Test Reports
 - 1. Certified copy of mill test reports on each steel, stainless steel, and aluminum proposed for use showing the physical properties and chemical analysis.
- E. Certificates
 - 1. Submit certification that the railing system is in compliance with OSHA and the FBC.

1.4 REFERENCE STANDARDS

- A. Aluminum Association (AA)
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A48 - Standard Specification for Gray Iron Castings.

3. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 4. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 5. ASTM A240 - Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Plate, Sheet, and Strip Pressure Vessels.
 6. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.
 7. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 8. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
 9. ASTM B429 - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
- C. American Welding Society (AWS)
1. AWS D1.2 - Structural Welding Code - Aluminum.
- D. Federal Specifications
1. FS-FF-B-575C - Bolts, Hexagonal and Square
 2. MIL-P-15145 – Paint, Zinc-Dust for Fresh Water
- E. Occupational Safety and Health Administration (OSHA)
- F. Florida Building Code (FBC)
- G. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.5 QUALITY ASSURANCE

- A. The work of this Section shall be completely coordinated with the work of other Sections. Verify, at the site, both the dimensions and work of other trades adjoining items of work in this Section before fabrication and installation of items herein specified.
- B. Furnish to the pertinent trades all items included under this Section that are to be built into the work of other Sections.
- C. All welding shall be performed by qualified welders and shall conform to the applicable AWS welding code. Welding of aluminum shall conform to AWS D1.2. Testing to be conducted and witnessed by an independent testing laboratory provided by the CONTRACTOR.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver items to be incorporated into the work of other trades in sufficient time to be checked prior to installation.

- B. Store materials on skids and not on the ground and block up so that they will not become bent or otherwise damaged. Handle materials with cranes or derricks. Do not dump material off cars or trucks nor handle in any other way that will cause damage.
- C. Repair items that have become damaged or corroded to the satisfaction of the ENGINEER prior to incorporating them into the work.

1.7 PROJECT/SITE REQUIREMENTS

- A. Field measurements shall be taken at the site, prior to fabrication of items, to verify or supplement indicated dimensions and to ensure proper fitting of all items.

PART 2 PRODUCTS

2.1 GENERAL

- A. The use of manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- B. Like items of materials shall be the end products of one manufacturer in order to provide standardization for appearance, maintenance and manufacturer's service.

2.2 MATERIALS

- A. Unless otherwise noted, materials for miscellaneous metals shall conform to the following standards:

1. Aluminum Extruded Pipe	ASTM B429, Alloy 6063 T6
2. Aluminum Extruded Shapes	ASTM B221, Alloy 6061 T6
3. Aluminum Sheet and Plate	ASTM B209, Alloy 6061 T6
4. Stainless Steel Plates, Sheets, and Structural Shapes	
a. Exterior, Submerged or Industrial Use	ASTM A240, Type 316 (Type 316L for welded)
b. Interior and Architectural Use	ASTM A240, Type 304 (Type 304L for welded)
5. Stainless Steel Bolts, Nuts, and Washers	ASTM A276, Type 316

2.3 ANCHORS, BOLTS AND FASTENING DEVICES

- A. Unless otherwise noted, bolts for the connection of aluminum or stainless steel shall be stainless steel machine bolts.
- B. Adhesive anchor system, for fastening to solid concrete substrate, shall be a system manufactured for the installation of post installed studs including anchoring hardware and chemical dispenser. Injection adhesive shall be a two-component epoxy system including a hardener and a resin, furnished in pre-measured side-by-side cartridges which keep the two components separate. Side-by-side cartridges shall be designed to accept a static mixing nozzle which thoroughly blends the two components and allows injection directly into the drilled hole. Adhesive shall be made for use in contact with potable water. Provide zinc plated carbon steel or Type 316 stainless steel stud assemblies as indicated on the Drawings consisting of an all-thread anchor rod with nut and washer. Adhesive anchor system shall be Hilti HIT-RE 500-SD; Simpson Strong Tie SET-XP; or equal. Unless otherwise noted, anchorage designs shown on the Drawings are based on Hilti

HIT-RE 500-SD, a different product may require a change in anchor location, embedment, or number of anchors.

- C. All post installed anchors into concrete shall be designed in accordance with ACI 318- Appendix D.

2.4 RAILINGS

- A. Handrail and railing systems shall comply with the requirements of OSHA and FBC.
- B. Aluminum railing and handrail shall be a welded or mechanically fastened, seamless, extruded aluminum pipe system. Rails shall be 6063-T6 alloy. Posts shall be 6061-T6 alloy. Splice and reinforcing sleeves, brackets, end caps, toeboards, etc, shall be aluminum alloy 6063-T6 or 6061-T6. Cast fittings shall be aluminum alloy No. 214. Railing system fastening hardware shall be Type 304 stainless steel. Aluminum shall have a mill finish.
- C. Railings shall be as shown on the Drawings, fabricated with 1-1/2-in nominal diameter pipe. Posts shall be Schedule 80 pipe, minimum and rails and handrail shall be Schedule 40 pipe, minimum. Posts and top rails shall be continuous. Spacing of posts shall not exceed 5-ft on center and shall be uniformly spaced except as otherwise shown on the Drawings. All railing posts shall be vertical.
- D. Welds shall be circumferential welds ground smooth and even to produce a railing that is neat in appearance and structurally sound. Welding methods shall be in conformity with AWS standards for the materials being joined. All rails to post connections shall be coped and fastened by continuous welds. There shall be no burrs, sharp edges or protrusions on any weld on any part of the handrail system. After fabrication, the welds and surrounding area shall be cleaned and hand buffed to blend with the adjacent finish. All mechanical fasteners shall be unobtrusively located in countersunk holes with the top flush with the surface of the rail. Bends in the railing shall be as indicated by the Drawings. No distortion of the circular railing shape will be allowed. Bends and terminal sections shall be made without the use of fittings. Corner bends shall be mitered and welded bends have a 3-in centerline radius.
- E. The bases or supports for railing posts and handrail shall be the types indicated on the Drawings.
 - 1. Aluminum railing posts, which may collect condensation, shall have a 3/16-in drain hole drilled immediately above the concrete encased area, the base flange, or supporting socket on the side away from the walking area. The bottom of the rail post between the drain hole and the bottom of the post shall be filled with an inert material such as a compressed closed cell neoprene rod.
- F. Toeboards shall be provided on all railing adjacent to a drop in elevation of 3-ft or more. Toeboards shall be 4-in high channels of the same material as the railing. The channels shall have a minimum thickness of 1/8-in and have flanges of not less than 3/4-in nor more than 1-1/2-in in width. Toeboards shall be positioned with a maximum clearance of 1/4-in from the floor and fastened to railing posts with 1/4-in stainless steel U-bolts, with J-bolts at corner posts and with clip angles and two 1/4-in stainless steel expansion bolts at walls.

2.5 ACCESS HATCHES

A. Access hatches shall have single leaf doors as indicated by the Drawings. The doors shall be 1/4- in aluminum diamond pattern plate with welded stiffeners, as necessary, to withstand an AASHTO H20 wheel load with a maximum deflection of 1/150th of the span. Hatches shall have an aluminum channel frame with a perimeter anchor flange for concrete attachment around the perimeter. Unless otherwise noted on the Drawings, use pivot torsion bars for counterbalance or spring operators for easy operation along with automatic door hold open. Hardware shall be durable and corrosion resistant with Type 316 stainless steel hardware used throughout. Provide removable lock handle and safety chains. Hatches shall be furnished with a fall protection grating system. Grating panels shall be constructed of fiberglass, molded in one piece and have load bearing bars in both directions to allow for use without continuous side support. Panel shall be designed to support a AASHTO H20 wheel load. The fall protection grating shall be high visibility safety yellow in color. Torsion rod lift assistance shall be provided for ease of operation and a hold open arm shall be included to automatically lock the panel in the fully open 90 degree position. A release handle shall be provided to close the grating panel and there shall be a provision to lock the panel to prevent unauthorized access. Finish shall be the factory mill finish for aluminum doors and frames with bituminous coating on surfaces exposed to wastewater. Hatches shall be flood tight. Span shall be as indicated on drawings. Access hatches shall be Type J-AL (flood tight) By Bilco Company, New Haven CT or Equal.

2.6 MISCELLANEOUS ALUMINUM

- A. All miscellaneous metal work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability. Holes shall be drilled or punched. Edges shall be smooth and without burrs. Fabricate supplementary pieces necessary to complete each item though such pieces are not definitely shown or specified.
- B. Connections and accessories shall be of sufficient strength to safely withstand the stresses and strains to which they will be subjected. Exposed joints shall be close fitting and jointed where least conspicuous. Threaded connections shall have the threads concealed where practical. Welded connections shall have continuous welds or intermittent welds as specified or shown. The face of welds shall be dressed flush and smooth. Welding shall be on the unexposed side as much as possible in order to prevent pitting or discoloration of the aluminum exposed surface. Provide holes for temporary field connections and for attachment of the work of other trades.
- C. Miscellaneous aluminum items shall include: beams, angles, closure angles, grates, hatches and any other miscellaneous aluminum called for on the Drawings and not otherwise specified.
- D. Angle frames for hatches, beams, grates, etc, shall be complete with welded strap anchors attached.

2.7 CASTINGS

- A. Casting shall be of good quality, strong, tough, even-grained, smooth, free from scale, lumps, blisters, sand holes and defects of any kind which render them unfit for the service for which they are intended. Castings shall be thoroughly cleaned and will be subjected to a hammer inspection in the field by the ENGINEER. All matching surfaces shall be machined to a true plane surface to allow contact surfaces to seat at all points without rocking. Allowances shall be made in the patterns so that the thickness specified shall not be reduced in obtaining finished surfaces.

Castings will not be acceptable if the actual weight is less than 95 percent of the theoretical weight computed from dimensions. The CONTRACTOR shall provide facilities for weighing castings in the presence of the ENGINEER.

- B. Frames, covers, cast grates and trench drains for structures shall be gray iron castings except as otherwise specified or indicated on the Drawings. Sizes shall be as shown on the Drawings. Covers shall have letters "WATER," "SANITARY SEWER," or "DRAIN," as applicable, embossed on top.
- C. Frames and covers for installation in slabs shall be heavy duty, R-6013-R-6099 Series as manufactured by Neenah Foundry Co., or equal.
- D. Electrical and telephone manhole and handhole frames and covers for structures shall be ductile iron castings. The covers shall be watertight. Covers shall have the word "ELECTRIC," "HIGH VOLTAGE," "LOW VOLTAGE," "SIGNAL," "TELEPHONE," as applicable, embossed on or cast into the top in letters 2-in high. The clear opening shall be 36-in unless otherwise indicated on the Drawings.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install all items except those to be embedded in concrete which shall be installed under Division 3. Items to be attached to concrete after such work is completed shall be installed in accordance with the details shown.
- B. Abrasions in the shop primer shall be touched up immediately after erection. Areas left unprimed for welding shall be painted with primer after welding.
- C. Specialty products shall be installed in accordance with the manufacturer's recommendations.
- E. Install adhesive anchor system in strict compliance with the manufacturer's recommendations, including drill bit diameter, surface preparation, temperature, moisture conditions, injection and installation of bolts. Use oil free compressed air to blast out loose particles and dust from the drilled holes. Bolts must be clean and free of dirt, oil, grease, ice or other material which would reduce bond.
- F. Where aluminum contacts a dissimilar metal, insert a 1/4-in thick neoprene isolator pads, 85 plus or minus 5 Shore A durometer, sized for full width and length of bracket or support.
- I. Where aluminum contacts masonry or concrete, insert a 1/4-in thick neoprene isolator pads, 85 plus or minus 5 Shore A durometer, sized for full width and length of bracket or support.

END OF SECTION

SECTION 09901

SURFACE PREPARATION AND SHOP PRIME PAINTING

PART 1- GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals required for the surface preparation and application of shop primers on the specified materials, as specified herein and as shown on the Drawings.
- B. Surface preparation and priming in field may be done only with the approval of the ENGINEER.
- C. This Section does not apply to factory finished items, unless noted otherwise.

1.02 RELATED WORK

- A. Finish Painting is included in Section 09902.

1.03 SUBMITTALS

- A. Submit to the ENGINEER, in accordance with Section 01300, complete shop drawings, manufacturer's specifications, and data on the proposed primers and detailed surface preparation, application procedures, and dry mil thickness.
- B. Submit to the ENGINEER, in accordance with Section 01300, representative physical samples of the proposed primers.

1.04 REFERENCE STANDARDS

- A. NSF International (NSF)
 - 1. NSF 61 - Drinking Water System Components - Health Effects
- B. The Society for Protective Coatings (SSPC)
 - 1. SSPC SP 1 - Surface Preparation Specification No. 1, Solvent Cleaning
 - 2. SSPC SP 2 - Surface Preparation Specification No. 2, Hand Tool Cleaning
 - 3. SSPC SP 3 - Surface Preparation Specification No. 3, Power Tool Cleaning
 - 4. SSPC SP 6 - Surface Preparation Specification No. 6, Commercial Blast Cleaning
 - 5. SSPC SP 7 - Surface Preparation Specification No. 7, Brush-off Blast Cleaning
 - 6. SSPC SP 10 - Surface Preparation Specification No. 10, Near-White Metal Blast Cleaning
 - 7. SSPC SP 13 - Surface Preparation Specification No. 13, Preparation on Concrete Surfaces
- C. American Society of Testing and Materials (ASTM)
 - 1. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating
- D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. The CONTRACTOR shall give the ENGINEER a minimum of 3-days advance notice of the start of any field surface preparation work and a minimum of 7-days advance notice of the start of any shop surface preparation work.
- B. All such work shall be performed only in the presence of the ENGINEER, unless the ENGINEER has granted prior approval to perform such work in his absence.
- C. Inspection by the ENGINEER, or the waiver of inspection of any particular portion of the work, shall not relieve the CONTRACTOR of his responsibility to perform the work in accordance with these specifications.
- D. Painting subcontractor shall provide 5 references, which show that the painting subcontractor has previous successful experience with the specified or comparable coating systems. Include the name, address, and the telephone number for the OWNER of each installation for which the painting subcontractor provided the protective coating.
- E. Compatibility of Coating Systems:
 - 1. Shop priming shall be done with primers that are guaranteed by the manufacturer to be compatible with their corresponding primers and finish coats specified in Section 09902 for use in the field and which are recommended by the manufacturer for use together.
- F. Primers containing lead will not be allowed.
- G. VOC Content: Determine VOC (Volatile Organic Compound) content of solvent borne and waterborne paints and related coatings in accordance with EPA Method 24 or ASTM D3960.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All priming materials shall be by the Tnemec Company, Inc.; equals by Ameron (VyGuard); Carboline and or ICI/Devco. The priming schedule has been prepared on the basis of Tnemec products (unless otherwise noted) and Tnemec recommendations for application. No brand other than those named will be considered for approval unless the brand and type of paint proposed for each item in the following schedule together with sufficient data substantiated by certified tests conducted at no expense to the OWNER, to demonstrate its equality to the primer(s) named is submitted to the ENGINEER in writing for approval within 30 days after the Signing of the Notice to Proceed. The type and number of tests performed shall be subject to the ENGINEER's approval.

2.02 PRIMER SCHEDULE

- A. The following types of primers by Tnemec Co have been used as a basis for the primer schedule:
 - 1. Series 90E-92: Tnemec - Zinc - high heat ethyl silicate (to 750 degrees F).
 - 2. Series N69-1255: Hi-build Epoxoline II - polyamidoamine gray epoxy primer.
 - 3. Series 90-97: Tnemec-Zinc - aromatic urethane, zinc rich primer.
 - 4. Series N140-1255: Potapox Plus Primer (tank white color) - polyamidoamine epoxy primer.

- B. The following surfaces shall have the types of primers scheduled below applied at the dry film thickness (DFT) in mils per coat noted:
1. Ferrous Metals
 - a. Submerged or subject to splashing (potable) - NSF STD 61
1 coat Series N140-1255 (3.5 - 4.5 milsDFT)
 - b. Nonsubmerged and not subject to splashing (exterior)
1 coat Series 90-97 (2.5 - 3.0 milsDFT)
 - c. Nonsubmerged and not subject to splashing (interior)
1 coat Series 69-1255 (3.5 - 4.5 mils DFT)
 - d. Surfaces exposed to temperatures above 250 degrees F: See Section 09902
2 coats 90E-92 (2.0 – 3.5 mils DFT per coat)
 2. Non-Ferrous Metals and Galvanized Steel
 - a. Submerged or subject to splashing (potable) - NSF STD 61
1 coat Series N140-1255 (3.0 to 5.0 mils DFT)
 - b. Nonsubmerged and not subject to splashing (exterior) - includes repair of cut edges and damage to galvanized steel
1 coat Series 90-97 (2.5 to 3.5 mils DFT)
 - c. Nonsubmerged and not subject to splashing (interior) - includes repair of cut edges and damage to galvanized steel
1 coat Series 90-97 (2.5 to 3.5 mils DFT)
 3. Aluminum embedded or in contact with concrete, masonry, or dissimilar materials shall be painted according to the schedule for aluminum in contact with dissimilar materials in Section 09902.
 4. Non-primed Surfaces:
 - a. Gears, bearings surfaces, and other similar surfaces that are not to be painted shall be given a heavy shop coat of grease or other suitable rust-resistant coating. This coating shall be maintained as necessary to prevent corrosion during all periods of storage and erection and shall be satisfactory to the ENGINEER up to the time of the final acceptance test.
 5. Exposed Bituminous Coated Pipe
 - a. A test patch must be run initially to test the paint's compatibility with the tar.
 - b. Before successive coats are applied per the schedule, any pipe scheduled to be painted and having received a coating of a tar or asphalt-compound shall be painted with:
2 coats Series N140-1255 (3.0 - 4.0 DFT per coat).

PART 3 - EXECUTION

3.01 APPLICATION

- A. Surface Preparation and Priming
1. General
 - a. Surfaces shall be dry and free of dust, oil, grease, dirt, rust, loose mill scale, and other foreign material before priming.
 - b. Shop prime in accordance with approved paint manufacturer's written recommendations.
 - c. Surface preparation for field painting unprimed surfaces or for touch up shall be the same.
 - d. Surface temperature and all other application conditions shall be in accordance with approved primer manufacturer's recommendations. Enclosures and auxiliary heat shall be utilized as necessary to achieve compliance.
 2. Ferrous Metals
 - a. Nonsubmerged and not subject to splashing
 - 1) Clean in accordance with SSPC SP 6 immediately prior to priming.

- 2) Fill all pits and dents and correct all imperfections to provide a smooth surface for painting.
- 3) Prime as scheduled.
- b. Submerged or subject to splashing
 - 1) Blast clean in accordance with SSPC SP 10 immediately prior to priming.
 - 2) Grind and sand smooth all metal welds, blisters, and imperfections according to SSPC SP 10.
 - 3) Fill all pits and dents and correct all imperfections to provide a smooth surface for painting.
 - 4) Prime as scheduled.
3. Non-Ferrous Metals
 - a. Clean in accordance with SSPC SP 1.
4. Primed, Galvanized, and Previously Painted Surfaces
 - a. All coated surfaces shall be cleaned prior to application of successive coats.
 - b. Test galvanized steel for manufacturer-recommended treatment or any passivation or pretreatment required.
 - c. Cut edges of galvanized sheets and exposed threads and cut ends of galvanized piping, electrical conduit, and metal pipe sleeves, which are not to be finish painted, shall be cleaned in accordance with SSPC SP 1 and primed as specified.
 - d. Failing existing coatings, as determined by the ENGINEER, shall be removed and the surface shall be prepared as listed for the specific material to be painted.
 - e. Galvanized and, when ordered, the other metal surfaces specified above shall be cleaned in accordance with SSPC SP 2 to provide a uniform 1-mil surface profile.
 - f. Shop-Finished Surfaces:
 - 1) All shop-coated surfaces shall be protected from damage and corrosion before and after installation by treating damaged areas immediately upon detection. Abraded or corroded spots on shop-coated surfaces shall be cleaned in accordance with SSPC SP 2 and then touched up with the same materials as the shop coat.
 - 2) All shop-coated surfaces that are faded, discolored, or which require more than minor touch-up in the opinion of the ENGINEER shall receive new surface preparation before being repainted.
 - 3) All final cleaning shall be done in accordance with SSPC SP 1 provided the solvent is compatible with the shop finish coat.
5. Exposed Bituminous Coated Pipe
 - a. Bituminous-coated pipe shall not be used in exposed locations. Pipe to be exposed in the finished work shall be primed in accordance with the requirements herein. Any bituminous-coated pipe that is inadvertently installed in exposed locations shall be cleaned in accordance with SSPC SP 6 (exposed, non-submerged and not subject to splashing), or SSPC SP 10 (submerged or subject to splashing) before priming and painting. After installation, all exterior exposed flanged joints shall have the gap between adjoining flanges sealed with a single component polysulfide sealant to prevent rust stains.
 - b. Primed as scheduled.

3.02 FABRICATED AND MANUFACTURED EQUIPMENT

- A. All items to be shop primed shall be blast cleaned as specified for applicable service prior to priming. If, in the opinion of the ENGINEER, any prime coating that has been improperly applied or if material contrary to this Section has been used, that coating shall be removed by SSPC SP 10 and reprimed in accordance with this Section.

- B. All shop prime coats shall be of the correct materials and applied in accordance with this Section. Remove any prime coats not in accordance with this Section by SSPC SP 10 and apply the specified prime coat at no additional cost to the OWNER.
- C. Shop primed surfaces shall be cleaned thoroughly and damaged or bare spots prepared as approved and retouched with the specified primer before the application of successive paint coats in the field.
- D. Shop finish coats, if proposed and allowed, shall be equal in appearance and protection quality to a field applied finish coat. If, in the opinion of the ENGINEER, a shop finish coat system does not give the appearance and protection quality of other work of similar nature, prepare the surfaces and apply the coat or coats of paint as directed by the ENGINEER to accomplish the desired appearance and protection quality. Submit to the ENGINEER substantial evidence that the standard finish is compatible with the specified finish coat.
- E. Properly protect the shop prime and finish coats against damage from weather or any other cause.
- F. Wherever equipment is required to be blast cleaned, the CONTRACTOR shall protect all motors, drives, bearings, gears, nameplates, and any other parts not required to be primed or painted, from blasting and from the entry of grit. Any equipment found to contain grit shall be promptly disassembled, thoroughly cleaned, and reassembled as ordered and approved.

END OF SECTION

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SECTION 09902

FINISH PAINTING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The work of this Section consists of furnishing all materials, labor, equipment, and incidentals required and performing all the painting necessary to complete this Contract in its entirety.
- B. It is the intent of this Section to paint all exposed structural and miscellaneous steel and appurtenances, pipe, fittings, supports, valves; all as specified herein, as indicated on the Drawings, and all other work obviously required to be painted unless otherwise specified. Minor items omitted in the schedule of work shall be included in the work of this Section where they come within the general intent of the specifications as stated herein.
- C. Paint items so noted in paragraph 1.01B and in accordance with the Painting Schedule and Color Coding Schedule herein. Provide letters and numbers for markings as specified. Items noted in Painting Schedule and Color Coding Schedule herein as having factory finish and other obviously factory finished items shall not be field painted. The CONTRACTOR is responsible for having damaged factory finish painted items repaired or, if so ordered, for replacing items. The various Sections are responsible, as stated in each, for preparation and field touch-up of abrasions, welds, and damaged primed areas of primed or galvanized components after erection.
- D. The following surfaces or items are not required to be painted under this Section:
 - 1. Portions of metal, other than aluminum, embedded in concrete. This does not apply to the back face of items mounted to concrete or masonry surfaces, which shall be painted before erection. Aluminum to be embedded in or in contact with concrete or masonry shall be coated to prevent electrolysis.
 - 2. Non-ferrous metals (except copper) and stainless steels, unless specified or noted otherwise.
 - 3. Manhole frames and covers.
 - 4. Fiberglass other than piping.
 - 5. Packing glands and other adjustable parts, and nameplates and data plates of mechanical equipment.
 - 6. Mechanical and electrical equipment that has been factory finished as specified in Divisions 13, 15, and 16.

1.02 RELATED WORK

- A. Surface Preparation and Shop Prime Painting is included in Section 09901.

1.03 SUBMITTALS

- A. Submit to the ENGINEER, in accordance with Section 01300, shop drawings, working drawings, and product data including manufacturer's specifications and data on the proposed paint systems and detailed surface preparation, application procedures, and dry film thickness (DFT). Certify that the systems submitted meet all applicable volatile organic carbon regulations. Equivalent systems are to be submitted at no additional costs to meet any new regulations.

- B. Submit to the ENGINEER, in accordance with Section 01300, color cards, including standard and special colors, for initial color selections.
- C. Documentation of the compatibility between prime coats and finish coats shall be submitted along with the date and ambient conditions for all prime coat installation with an established recoat window allowed for each prime system. Corrective surface preparation techniques shall be submitted for all systems in the event that the recoat window is missed.

1.04 REFERENCE STANDARDS

- A. NSF International (NSF)
 - 1. NSF 61 - Drinking Water System Components - Health Effects
- B. National Association of Pipe Fabricators
 - 1. NAF 500-03 Surface Preparation Standard for Ductile Iron Pipe and Fittings in Exposed Locations Receiving Special External Coatings and/or Special Internal Linings
- C. Occupational Safety and Health Act (OSHA)
 - 1. Air Pollution Control Rules
 - 2. Color Coding
- D. The Society for Protective Coatings (SSPC)
 - 1. SSPC-SP 6 - Commercial Blast Cleaning
- E. National Association of Corrosion Engineer's (NACE)
 - 1. RP0188-88 - Standard Recommended Practice for Discontinuing (Holiday) Testing of Protective Coatings
- F. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. Manufacturer Representative
 - 1. The CONTRACTOR shall require the paint manufacturer to furnish a manufacturer's qualified technical representative to visit the project site for technical support as required and ordered and as may be necessary to resolve field questions or problems attributable to or associated with the manufacturer's products furnished under this Contract or the application thereof.
- B. Cold Weather Construction
 - 1. All paint shall be at room temperature before applying, and no painting shall be done when the temperature is below 50 degrees F, in dust-laden air, when rain or snow is falling, or until all traces of moisture have completely disappeared from the surface to be painted. Lower temperatures will only be allowed with written instructions from the paint manufacturer.
- C. Inspection and Testing
 - 1. All materials and work shall be accessible and subject to inspection by the ENGINEER.
 - 2. The completed work shall be inspected visually by the ENGINEER for skips, holidays, hiding, uniform color and appearance, and other imperfections. All defective work shall be corrected by the CONTRACTOR.

3. Coating thickness on steel shall be determined in accordance with SSPC PA 2. The number of readings will be a minimum of that stated in SSPC PA 2.
4. Coating integrity for coatings in immersion areas or subjected to splash and spillage shall be determined in accordance with NACE RP0188-88 using the low voltage wet sponge test method. All holidays will be clearly marked for repair.
5. The CONTRACTOR shall furnish to the job site and use for coating inspection and make available to the ENGINEER, the following test equipment:
 - a. Wet film thickness gauge.
 - b. Dry film thickness gauge (with certified thickness calibrator) equal to Mikrotest III; Elcometer Inspector III; or Positest.
 - c. Surface Temperature Gauge.
 - d. Holiday Detector, low voltage type such as Tinker & Rasor Model M-1, Series 9533.
 - e. SSPC VIS-1-89T "Pictorial Surface Preparation Standard."
 - f. Keane-Tator Surface Comparator Number 372, or equal.
 - g. NBS Certified Coating Thickness Standards.
 - h. Sling Psychrometer.
 - i. Surface moisture metering device equal to Delmhors Model DB.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. All painting materials shall be delivered to the mixing room in unbroken containers, bearing the manufacturer's brand, date of manufacture, and name. They shall be used without adulteration and mixed, thinned, and applied in strict accordance with manufacturer's directions for the applicable materials and surface before using.
- B. Painting materials shall be delivered to the job site in the original unopened containers, bearing the manufacturer's label. A Product Data Sheet and Material Safety Data Sheet for all painting, activators, thinners, accelerators, and other materials shall be obtained from the manufacturer for each shipment of materials to the job site. Painting materials shall be stored in a dry, well-ventilated area, not in direct contact with the ground, where the temperature is maintained between 40 and 120 degrees F. Damaged materials and/or materials exceeding the shelf life shall not be used.
- C. Paints shall be mixed in proper containers of adequate capacity. All paints shall be thoroughly stirred before use and shall be kept stirred while using. No unauthorized thinners or other materials shall be added to any paint. Air shall not be used directly for agitation. Pigmented material shall be strained after mixing. Where application equipment has strainers, they should be sized so as to allow pigment to pass but not foreign material. Multiple (2 or more) component catalyzed materials may not be used beyond the recommended pot life.
- D. Work areas will be designated by the OWNER for storage and mixing of all painting materials. Materials shall be in full compliance with the requirements of pertinent codes and fire regulations. Proper containers outside of the buildings shall be provided and used for painting wastes, and no plumbing fixture shall be used for this purpose.
- E. All recommendations of the paint manufacturer in regard to the health and safety of workmen shall be followed.

1.07 MAINTENANCE - SPARE MATERIALS

- A. Spare Material
 1. Furnish one unopened gallon can of each type and each color of paint specified herein.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All painting materials shall be supplied by one manufacturer, unless otherwise approved by the ENGINEER. The painting schedule has been prepared on the basis of Tnemec Company Inc. products and application recommendations, unless otherwise noted in the schedule. Equals by Ameron (VyGuard), Carboline, or ICI/Devoe. All materials shall meet NSF Standard 61 and be equivalent to the Tnemec products listed in the following schedule. No brand other than those named will be considered for approval unless the brand and type of paint proposed for each item in the following schedule together with sufficient data substantiated by certified tests, conducted at no expense to the Owner, to demonstrate its equality to the paint(s) named, is submitted in writing to the ENGINEER for approval within 30 days after the signing of the Notice to Proceed. The type and number of tests performed shall be subject to the ENGINEER's approval.
- B. Shop priming shall be done with primers that are guaranteed by the manufacturer to be compatible with the finish paints to be used. Refer to Section 09901 for special primers.
- C. No paint containing lead will be allowed. Oil shall be pure boiled linseed oil.

2.02 PAINT TYPES

- A. The following types of paints by Tnemec Co. have been used as a basis for the paint schedule:

<u>Series</u>	<u>Series Name</u>	<u>Generic Description</u>
66	Hi-Build Epoxoline	Polyamide Epoxy
N69	Hi-build Epoxoline II	Polyamidoamine Epoxy
73	Endura-Shield	Semi-Gloss Acrylic Urethane

2.03 PAINT SCHEDULE

- A. The following surfaces shall have the types of paints scheduled below applied at the dry film thickness (DFT) in mils per coat noted:
 - 1. Ductile iron pipe
Exterior

Surface Preparation: SSPC-SP6
1st Coat: Series N69 (6.0 – 8.0 mils DFT)
2nd Coat: Series 66 (2.0 – 4.0 mils DFT)
3rd Coat: Series 73 (2.0 – 3.0 mils DFT)
Min total DFT for 3 coats: 12.0 mils
- B. Any surfaces not specifically named in the Schedule and not specifically excepted shall be prepared, primed, and painted in the manner and with materials consistent with these specifications. The ENGINEER shall select which of the manufacturer's products, whether the type is indicated herein or not, shall be used for such unnamed surfaces. No extra payment shall be made for this painting.

2.04 LETTERING OF TITLES

- A. Each pipe system shall be labeled with the name of the materials in each pipeline and alongside this an arrow indicating the direction of flow of liquids. Titles shall be as so described in attached schedule. Titles shall not be located more than 5-li-ft apart, and shall also appear directly adjacent to each side of any wall the pipeline breaches, adjacent to each side of the valve regulator, flowcheck, strainer cleanout, and all pieces of equipment.
- B. Titles shall identify the contents by complete name. Identification title locations shall be determined by the ENGINEER but in general they shall be placed where the view is unobstructed and on the two lower quarters of pipe or covering where they are overhead. Title should be clearly visible from operating positions especially those adjacent to control valves.
- C. Titles on equipment shall be applied at eye level on machines where possible or at the upper most broad vertical surface of low equipment. Where more than one piece of the equipment item to be titled exists, the items shall be numbered consecutively as indicated on the mechanical drawings or as directed by the ENGINEER; for example Pump No. 1, Pump No. 2, etc. Titles shall be composed and justified on the left hand side as follows:
 - 1. Pump No. 1
- D. Application of titles
 - 1. The color of the titles shall be black or white, as approved, to best contrast with the color of the pipes and equipment and shall be stencil applied.
 - 2. Text is to be in ALL CAPS worded exactly as shown in the Schedule. Titles are to be printed in a single line.
 - 3. Letter sizes

Outside Diameter of Pipe or Covering (in)	Size of Legend Letters (in)
3/4 to 1-1/4	1/2
1-1/2 to 2	3/4
2-1/2 to 6	1-1/4
8 to 10	2-1/2
More than 10	3-1/2

Equipment titles are to be 2-in high.

- 4. Arrow sizes. Where "a" is equal to 3/4 of outside diameter of pipe or covering, the arrow shaft shall be 2 "a" long by 3/8 "a" wide. The arrow head shall be an equilateral triangle with sides equal to "a." Maximum "a" dimension shall be 6-in.
- 5. When using direction arrows, point arrowhead away from pipe markers and in direction of flow. If flow can be in both directions, use a double-headed directional flow.

2.05 TITLES FOR EQUIPMENT

- A. Titles shall be provided in vinyl film on all equipment using 2-in high Optima Bold upper case, Grid 2 spacing, white or black in color as approved depending on substrate. Titles shall be mounted at eye level on machines where possible or at the upper most broad vertical surface of low equipment. Where more than one piece of the equipment item to be titled exists, the items shall be numbered consecutively as indicated on the mechanical drawings or as directed by the ENGINEER; for example Pump No. 1, Pump No. 2, etc. Titles shall be composed in more than one line if required and justified on the left-hand side as approved.

2.06 METAL TAGS

- A. For pipelines smaller than 3/4-in in diameter, securely fasten metal tags, 2-1/2-in by 1/2-in, of Birmingham or Stubs 17-gauge brass with lettering etched and filled with enamel. Tags shall be approved by the ENGINEER.

2.07 VALVE MARKERS

- A. Furnish and install aluminum tags with engraved lettering as approved by ENGINEER on all above ground chemical system and process piping valves.

2.08 FABRICATED EQUIPMENT

- A. Unless otherwise indicated, all fabricated equipment shall be shop primed and shop or field finished.
- B. All items to be shop primed shall be thoroughly cleaned of all loose material prior to priming. If, in the opinion of the ENGINEER, any prime coating shall have been improperly applied or if material contrary to these specifications shall have been used, that coating shall be removed by sandblasting to white metal and reprimed in accordance with these specifications.
- C. All shop prime coats shall be of the correct materials and applied in accordance with these specifications. Remove any prime coats not in accordance with these specifications by sandblasting and apply the specified prime coat at no additional cost to the OWNER.
- D. Shop primed surfaces shall be cleaned thoroughly and damaged or bare spots retouched with the specified primer before the application of successive paint coats in the field.
- E. The CONTRACTOR shall be responsible for and take whatever steps are necessary to properly protect the shop prime and finish coats against damage from weather or any other cause.
- F. A shop finish coat shall be equal in appearance and protection quality to a field applied finish coat. If, in the opinion of the ENGINEER, a shop finish coat does not give the appearance and protection quality of other work of similar nature, prepare the surfaces and apply the coat or coats of paint as directed by the ENGINEER to accomplish the desired appearance and protection quality. Submit to the ENGINEER substantial evidence that the standard finish is compatible with the specified finish coat.

PART 3 - EXECUTION

3.01 GENERAL

- A. No outside spray painting shall be allowed if wind speed exceeds 5 miles per hour or the temperature/humidity is beyond the manufacturer's recommendations. The CONTRACTOR shall be responsible for repairs due to overspray.

3.02 PREPARATION OF SURFACES

- A. All surfaces to be painted shall be prepared as specified in Section 09901 and as specified herein and shall be dry and clean before painting. Special care shall be given to thoroughly clean interior concrete and CMU surfaces of all marks before application of finish.

- B. Concrete surfaces shall have been finished as specified in Division 3 and Section 09901. The CONTRACTOR shall report unsatisfactory surfaces to the ENGINEER. Concrete shall be free of dust, oil, curing compounds, and other foreign matter, and shall conform to ASTM D4258.
- C. Refer to Section 09901 for additional requirements.
- D. Aluminum embedded or in contact with concrete, masonry, or dissimilar materials must be painted according to the schedule for aluminum in contact with dissimilar materials.

3.03 WORKMANSHIP

A. General

1. Primer (spot) and paint used for a particular surface shall, in general, be as scheduled for that type of new surface. Confirm with the paint manufacturer that the paint proposed for a particular repaint condition will be compatible with the existing painted surface. Sample repainted areas on the actual site will be required to insure this compatibility. Finished repainted areas shall be covered by the same guarantee specified for remainder of work.
2. Protection of furniture and other movable objects, equipment, fittings and accessories shall be provided throughout the painting operations. Canopies of lighting fixtures shall be loosened and removed from contact with surface, covered and protected and reset upon completion. Remove all electric plates, surface hardware, etc., before painting, protect and replace when completed. Mask all machinery nameplates and all machined parts not receiving a paint finish. Dripped or spattered paint shall be promptly removed. Lay drop cloths in all areas where painting is being done to adequately protect flooring and other work from all damage during the operation and until the finished job is accepted.
3. On metal surfaces apply each coat of paint at the rate specified by the manufacturer to achieve the minimum dry mil thickness required. If material has thickened or must be diluted for application by spray gun, the coating shall be built up to the same film thickness achieved with undiluted material. One-gallon of paint as originally furnished by the manufacturer shall not cover a greater area when applied by spray gun than when applied unthinned by brush. Deficiencies in film thickness shall be corrected by the application of an additional coat(s). On masonry, application rates will vary according to surface texture, however, in no case shall the manufacturer's stated coverage rate be exceeded. On porous surfaces, it shall be the painter's responsibility to achieve a protective and decorative finish either by decreasing the coverage rate or by applying additional coats of paint.
4. Paints shall be mixed in proper containers of adequate capacity. All paints shall be thoroughly stirred before use and shall be kept stirred while using. No unauthorized thinners or other materials shall be added to any paint.
5. Only skilled painters shall be used on the work and specialists shall be employed where required.
6. Smoking shall not be permitted while preparing surface or applying coatings.

B. Field Priming

1. Steel members, metal castings, mechanical and electrical equipment, and other metals that are shop primed before delivery at the site will not require a prime coat on the job. All piping and other bare metals to be painted shall receive one coat of primer before exposure to the weather, and this prime coat shall be the first coat as specified in the painting schedule.
2. Equipment which is customarily shipped with a baked-on enamel finish or with a standard factory finish shall not normally be field painted unless the prefinished equipment is specifically color selected and unless the finish has been damaged in transit or during installation. Surfaces that have been shop painted and have been damaged, or where the shop coats or coats of paint have deteriorated, shall be properly cleaned and retouched before any

successive painting is done on them in the field. All such field painting shall match as nearly as possible the original finish.

3. Exposed Bituminous Coated Pipe: See Section 09901.
4. Equipment shipped with a protective shop painting coat or coats shall be touched up to the satisfaction of the ENGINEER with primers as recommended by the manufacturer of the finish paint.

C. Field Painting

1. All painting at the site shall be designated as Field Painting.
2. All painting at the site shall be under the strict inspection of the ENGINEER. Only skilled painters and, where dictated by special conditions or systems and so ordered, specialist painters shall be used for the work.
3. All paint shall be a room temperature before applying, and no painting shall be done when the temperature is below 60 degrees F, in dust-laden air, when rain or snow is falling, or until all traces of moisture have completely disappeared from the surface to be painted.
4. All surfaces to be painted as well as the atmosphere in which painting is to be done shall be kept warm and dry by heating and ventilation, if necessary, until each coat of paint has hardened. Any defective paint shall be scraped off and repainted in accordance with the ENGINEER's directions.
5. Successive coats of paint shall be tinted so as to make each coat easily distinguishable from each other with the final undercoat tinted to the approximate shade of the finished coat to ensure no show through as approved.
6. Finish surfaces shall not show brush marks or other irregularities. Undercoats shall be thoroughly and uniformly sanded with the type of sandpaper appropriate to remove defects and provide a smooth even surface. Top and bottom edges of doors shall be painted and all exterior trim shall be back-primed before installation.
7. Painting shall be continuous and shall be accomplished in an orderly manner so as to facilitate inspection. All exterior concrete and masonry paint shall be performed at one continuous manner structure by structure. Materials subject to weathering shall be prime coated as quickly as possible.
8. Surfaces of exposed members that will be inaccessible after erection shall be cleaned and painted before erection.
9. All materials shall be brush painted unless spray painting is specifically approved by the ENGINEER. The CONTRACTOR shall be responsible for all damage caused by overspray or drifting.
10. All painting shall be performed by approved methods with number of coats modified as required to obtain the total dry film thickness specified. Spray painting shall be performed specifically by methods submitted and as approved by the ENGINEER. The CONTRACTOR shall be responsible for all damage caused by overspray or drifting. On concrete or masonry, back-rolling after spraying shall be undertaken immediately following each coat to assure that all voids and holes are wet out and fully coated. Back-rolling may be deleted from the final coat if the test panel indicates that the prior coats followed by back-rolling is sufficient to provide a continuous coating without pinholes.
11. Coating integrity shall be determined in accordance with NACE RP-0188-88 using the low voltage wet sponge test method. All holidays will be clearly marked for repair.
12. Before final acceptance of the work, all damaged surfaces of paint shall be cleaned and repainted as directed by the ENGINEER. Completed work shall be free from runs, drips, sags, holidays, voids, and other imperfections. Finish coats shall provide complete hiding and uniform color. All defective work shall be corrected by the CONTRACTOR or applicator at no cost to the OWNER.
13. Damaged coatings, pinholes, and holidays shall be feather-edged and repaired in accordance with recommendations of the paint manufacturer.

14. Number of coats in the specification are a minimum required. Additional coats may be required to obtain the minimum required paint thickness, depending on method of application, difference in manufacturer's products and atmospheric conditions.

3.04 COLOR CODING FOR PIPES AND EQUIPMENT

- A. Color coding shall consist of color code painting and identification of all exposed conduits, trough items, and pipelines for the transport of gases, liquid, and semi-liquids including all accessories such as valves, insulated pipe coverings, fittings, junction boxes, bus bars, connectors, and all operating accessories which are integral to the whole functional mechanical pipe and electrical conduit system. Colors shall be as noted in the Color Coding Schedules at the end of this Section.
- B. All hangers and pipe support floor stands shall be painted the same color and with the same paint as the pipe it supports. The system shall be painted up to but not including the flanges attached to the mechanical equipment nor the flexible conduit connected to electrical motors. When more than one pipe system is supported on the same bracket, the bracket shall be painted the same color as the adjacent wall or ceiling. Colors shall be as noted in the Color Coding Schedule as selected and approved by ENGINEER.
- C. All systems that are an integral part of the equipment, that is originating from the equipment and returning to the same piece of equipment, shall be painted between and up to but not including, the fixed flanges or connections on the equipment.
- D. The color code establishes, defines, and assigns a definite color for each category of pipe. Pipelines, equipment, or other items that are not listed in the Color Coding Schedule shall be assigned a color by the ENGINEER and shall be treated as an integral part of the Contract.
- E. Banding for pipes shall be as specified in the Color Coding Schedule. Bands shall be 2-in wide and spaced 5-ft on center, located on each end of the pipe title, at 2-ft from the title bands, and at wall penetrations.
- F. All moving parts, drive assemblies, and covers for moving parts which are potential hazards shall be Safety Orange #CA26.
- G. All safety equipment shall be painted in accordance with OSHA standards.
- H. All inline equipment and appurtenances not assigned another color shall be painted the same base color as the piping. The pipe system shall be painted with the pipe color up to but not including the flanges attached to pumps and mechanical equipment assigned another color. Tanks shall be painted the color of the piping system that they serve, unless the tank is fiberglass and levels are monitored through the tank.
- I. All conduit shall be painted to match its background surface.
- J. Control panels shall be factory finished.
- K. All colors will be confirmed by the ENGINEER from color charts submitted by the CONTRACTOR, based on the color coding schedule herein.

3.05 COLOR IDENTIFICATION

- A. All color numbers and names herein refer to master color card. Colors of specified equal manufacturers may be substituted with approval of the ENGINEER.
- B. Building surface colors shall be painted as scheduled in the Color Coding Schedule or as selected by the ENGINEER.
- C. The following Tnemec colors shall be used as a basis for the Color Coding Schedule:

<u>Colors</u>	<u>Tnemec Name</u>	<u>Tnemec #</u>
Dark Blue	Academy Blue	35BL

3.06 COLOR CODING SCHEDULE

- A. Color selection for the following items are to be selected by the ENGINEER and reviewed by the OWNER at the time of shop drawing review. The CONTRACTOR shall submit color charts for color selections.
- B. The following list of piping is intended to identify all potential piping and establish a color selection for each based on industry standards. This project may not necessarily incorporate all piping listed, and the OWNER may require a different color schedule. The final color schedule will be determined by the ENGINEER and confirmed by the OWNER at the time of shop drawing review. The CONTRACTOR shall submit standard color charts for color selections.

<u>Piping and Legend</u>	<u>Color</u>	<u>Bands</u>
Potable Water	Blue	--

3.07 CLEANUP

- A. The premises shall at all times be kept free from accumulation of waste material and rubbish caused by employees or work. At the completion of the painting remove all tools, scaffolding, surplus materials, and all rubbish from and about the buildings, and leave work "broom clean" unless more exactly specified.
- B. Upon completion, remove all paint where it has been spilled, splashed, or splattered on all surfaces, including floors, fixtures, equipment, furniture, etc., leaving the work ready for inspection.

END OF SECTION

SECTION 11303

SUBMERSIBLE SUMP PUMPS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals required and install, complete and ready for operation, simplex submersible sump pump as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Yard piping is included in Division 2.
- B. Concrete work is included in Division 3.
- C. Mechanical piping, valves, pipe hangers and supports are included in the respective Sections of Division 15.
- D. Electrical work is included in Division 16.

1.03 SUBMITTALS

- A. Copies of all materials required to establish compliance with the Specifications shall be submitted in accordance with the provision of the General Conditions and Section 01300 Submittals shall include at least the following:
 - 1. Certified shop drawings showing all important details of construction, dimensions and anchor bolt locations.
 - 2. Descriptive literature, bulletins, and/or catalogs of the equipment.
 - 3. Data on the characteristics and performance of each size pump. Data shall include guaranteed performance curves, based on actual shop tests of duplicate units, which show that they meet the specified requirements for head, capacity, efficiency and horsepower. Curves shall be submitted on 8-1/2-inch by 11-inch sheets.
 - 4. The total weight of the equipment including the weight of the single largest item.
 - 5. A complete total bill of materials for all equipment.

1.04 DESCRIPTION OF SYSTEMS

- A. All the equipment specified herein is intended to be standard equipment for pumping water that has been collected in sumps.

1.05 QUALIFICATIONS

- A. The submersible sump pumps shall be Model HP33 as manufactured by Hydromatic or equal.

1.06 OPERATING INSTRUCTIONS

- A. Copies of an operating and maintenance manual for each size pump shall be furnished to the Engineer as provided for in Section 01730. The manuals shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc. that are required to instruct operating and maintenance personnel unfamiliar with such equipment.

PART 2 – PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. The equipment covered by these Specifications is intended to be standard pumping equipment of proven ability as manufactured by reputable concerns having long experience in the production of such equipment. The equipment furnished shall be designed, constructed, and installed in accordance with the best practice and methods, and shall operate satisfactorily when installed as shown on the Drawings.
- B. All parts shall be so designed and proportioned as to have liberal strength, and stiffness and to be especially adapted for the work to be done. Ample room and facilities shall be provided for inspection, repairs, and adjustment.
- C. Brass or stainless steel nameplates giving the name of the manufacturer, the rated capacity, head, speed, serial number, model number, horsepower, voltage, amperes and all other pertinent data shall be attached to each pump.
- D. The nameplate ratings for the motors shall not be exceeded, nor shall the design service factor be reduced when its pump is operating at any point on its characteristic curve at maximum speed.

2.02 SUBMERSIBLE SUMP PUMPS

- A. General:
 - 1. The sump pump shall be of the heavy duty, non-clog impeller submersible type.
- B. Performance Requirements:
 - 1. The pump shall be designed and manufactured as specified for the conditions of service tabulated below.
 - a. Operation – Automatic with float switch
 - b. Discharge size – 1.5 inches (minimum)
 - c. Capacity – 35-40 gpm
 - d. Total dynamic head – 12 feet
 - e. Solid passing size – ½ inch
 - f. Drive horsepower – 1/3 hp
 - g. Power Supply – see Electrical Drawings
- C. The casing shall be ASTM A48 Class 30 cast iron and have a minimum 1.5-inch NPT discharge.
- D. Motor shall be oil filled for continuous duty and be controlled by an integral diaphragm switch.
- E. Shaft shall be stainless steel.

2.03 CONTROLS

- A. Sump pump shall be automatically controlled by the liquid level in the sump. A diaphragm switch shall be provided to automatically start/stop the pump.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Installation shall be in strict accordance with the Manufacturer's instructions and recommendations in the locations shown on the Drawings.
- B. Supply all anchor bolts, temporary lift equipment, power, water, labor, and all other incidentals required for the proper installation of the pumps.

3.02 SURFACE PREPARATION AND SHOP PAINTING

- A. All surfaces shall be prepared, shop primed and finish coated as part of the work under this Section.

3.03 INSPECTION AND TESTING

- A. After the pump has been completely installed, conduct in the presence of the Engineer such tests as are necessary to indicate that pump performance conforms to the Specifications. Supply all electric power, water, labor, equipment, and incidentals required to complete the field test. If the pump performance does not meet the Specifications, pump shall be removed and replaced with pump that satisfy the conditions specified. Any component parts which are damaged as a result of testing or which fail to meet the requirements of the Specification shall be replaced, reinstalled and retested at the Manufacturer's expense.

END OF SECTION

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SECTION 13300

INSTRUMENTATION AND CONTROLS – GENERAL PROVISIONS

1.01 SCOPE OF WORK

- A. The Contractor shall procure the services of a Process Control System Supplier (PCSS) to furnish and install all materials, equipment, labor and services, required to achieve a fully integrated and operational system as specified herein, in the Specification Sections listed below, and in related drawings, except for those services and materials specifically noted.
- B. The PCSS shall serve as the System Integrator for all labor, material, equipment, and incidentals as shown and specified, required to furnish and install the following:
 - 1. Furnish and install a new remote telemetry equipment at the two locations shown on the contract documents which shall include a new RTU, uninterruptable power supply, and radio in NEMA 4X enclosure. RTU shall monitor and control equipment as described on the P&IDs.
 - 2. Furnish and install all field instrumentation and devices shown on the process and instrumentation diagrams, and as defined and listed in 13315.
 - 3. Provide all application software programming, including RTU programming, and establishment of communication. PCSS to coordinate with Longboat Key staff for integration of new pressure reducing station and flow metering station into the existing SCADA system.
 - 4. Furnish and install new antenna and associated communication cable. PCSS to connect new antenna and new RTU panel as shown on drawing I-4.
- C. Auxiliary and accessory devices necessary for system operation or performance, such as transducers, relays, signal amplifiers, intrinsic safety barriers, signal isolators, software, and drivers to interface with existing equipment or equipment provided by others under other Sections of these specifications, shall be included whether they are shown on the Drawings or not.
- D. All equipment and installations shall satisfy applicable Federal, State and local codes.
- E. Use the equipment, instrument, and loop numbering scheme shown on the Drawings and specifications in the development of the submittals. Do not deviate from or modify the numbering scheme without the Engineer's approval.

1.02 RELATED WORK

- A. Instrumentation and Controls conduit systems are specified in Section 16110.
- B. Instrumentation signal cable and alarm and status wiring are specified in Section 16120.
- C. Relevant equipment sections in Division 11, 13, and 15.

1.03 SUBMITTALS

A. General Requirements:

1. Refer to Section 01300 for general submittal requirements.
2. Shop drawings shall demonstrate that the equipment and services to be furnished comply with the provisions of these specifications and shall provide a complete record of the equipment as manufactured and delivered.
3. Submittals shall be complete; giving equipment specifications, details of connections, wiring, ranges, installation requirements, and specific dimensions. Submittals consisting of only general sales literature shall not be acceptable.
4. Substitutions on functions or type of equipment specified shall not be acceptable unless specifically noted.
5. Separate submittals shall be made for each submittal listed below.

B. Deviation List, and Schedule Submittal

1. Exceptions to the Specifications or Drawings shall be clearly defined in a Deviation List. The Deviation List shall consist of a paragraph by paragraph review of the Specifications indicating acceptance or any proposed deviations, the reason for exception, the exact nature of the exception and the proposed substitution so that an evaluation may be made by the Engineer. If no exceptions are taken to the specifications or drawings the PCSS shall make a statement as such. If there is no statement by the PCSS, then it is acknowledged that no exceptions are taken.
2. Project schedule shall be prepared in Gantt chart format clearly showing task linkages for all tasks and identifying critical path elements. PCSS schedule must be based on the General Contractor schedule and must meet all field installation, testing, and start-up milestones in that schedule. The project schedule shall illustrate I&C related major project milestones including the following:
 - a. Schedule for all subsequent project submittals. Include the time required for Contractor submittal preparation, Engineer's review time, and a minimum of two complete review cycles.
 - b. Shipment of instrument and control system equipment.
 - c. Installation of instrument and control system equipment.
 - d. Testing: Schedule for all testing. .

C. Field Instruments Submittal

1. Refer to the Instruments section for submittal requirements.

D. Testing Submittals

1. Submit, in one submittal, the following testing related documents to be used during the Operational Readiness Test (ORT) and the Functional Demonstration Test (FDT).
 - a. Status signoff forms
 - 1) Develop and submit project specific I/O Status and Automatic Control Strategy signoff forms to be used during field testing to organize and track each loop's inspection, adjustment, calibration, configuration, and testing status and sign off. Include sign-off forms for each testing phase showing all loops.
 - 2) Submit testing forms prior to start of testing.
2. Testing Procedures
 - a. Submit detailed procedures proposed to be followed for each of the tests specified herein. The test procedures shall serve as the basis for the execution of the required tests to demonstrate that the system meets and functions as specified.
 - b. The documents shall be structured in an orderly and easy to follow manner to facilitate an efficient and comprehensive test.
 - c. The test procedures shall indicate all pre-testing setup requirements, all required test equipment, and simulation techniques to be used.
 - d. The test procedures shall be structured in a cause and effect manner where the inputs are indicated, and the outputs are recorded.
 - e. The test procedures shall include the demonstration and validation under normal operating conditions and under various failure scenarios as specified in the contract documents.
 - f. Testing may not start until all Testing Submittals have been approved.

E. Test Documentation

1. Upon completion of each required test, document the test by submitting a copy of the signed off Testing Status forms. Testing shall not be considered complete until the signed-off forms have been submitted and approved. Submittal of other test documentation, including "highlighted" wiring diagrams with field technician notes, are not acceptable substitutes for the formal test documentation.

F. Spares, Expendables, and Test Equipment Lists Submittal

1. Submit a list of, and descriptive literature for, spares, expendables, and test equipment.
2. Submit a list of, and descriptive literature for, additional spares, expendables, and test equipment recommended by the manufacturer.
3. Submit unit and total costs for the additional spare items specified or recommended for each subsystem.

G. Operations and Maintenance (O&M) Manuals

1. The operations and maintenance manuals shall, at a minimum, contain the following information:

a. Table of Contents

- 1) A Table of Contents shall be provided for the entire manual with the specific contents of each volume clearly listed. The complete Table of Contents shall appear in each volume.

b. Instrument and Equipment Lists

- 1) The following lists shall be developed in Microsoft Excel format and provided not only as a hardcopy in O&M but also electronically on a CD.
- 2) An instrument list for all devices supplied including tag number, description, specification section and paragraph number, manufacturer, model number, serial number, range, span, location, manufacturer phone number, local supplier name, local supplier phone number, completion year replacement cost, and any other pertinent data.
- 3) An equipment list for all non-instrument devices supplied listing description, specification section and paragraph number, manufacturer, model number, serial number, location, manufacturer phone number, local supplier name, local supplier phone number, completion year replacement cost, and any other pertinent data.

c. Equipment Operations and Maintenance Information

- 1) ISA S20 data sheets shall be provided for all field instruments. For non-field instrumentation devices, provide a cover page for each device, piece of equipment, and OEM software that lists date, specification number, product name, manufacturer, model number, Location(s), and power required. Preferred format for the cover page is ISA S20, general data sheet; however, other formats will be acceptable provided they contain all required information
- 2) Vendor O&M documentation for each device, piece of equipment, or OEM software shall be either new documentation written specifically for this project, or modified standard vendor documentation. All standard vendor documentation furnished shall have all portions that apply clearly indicated with arrows or circles. All portions that do not apply shall be neatly lined out or crossed out. Groups of pages that do not apply at all to the specific model supplied shall be removed.
- 3) Include the calibration forms developed as specified in this section.

d. As-Built Drawings

- 1) Complete as-built drawings, including all drawings and diagrams specified in this section under the "Submittals" section. These drawings shall include all termination points on all equipment the system is connected to, including terminal points of equipment not supplied by the PCSS.
- 2) As built documentation shall include information from submittals, as described in this Specification, updated to reflect the as-built system. Any errors in or

modifications to the system resulting from the Factory and/or Functional Acceptance Tests shall be incorporated in this documentation.

e. Original Licensed Software

- 1) Submit original software diskettes or CD-ROMs of all software provided under this Contract. Submit original paper based and electronic documentation for all software provided. Submit license agreement information including serial numbers, license agreements, User Registration Numbers and related information. All software provided under this Contract shall be licensed to the Owner at the time of purchase. Provide media in software sleeves within O&M manual.

f. Electronic O&M Information

- 1) In addition to the hard copy of O&M data, provide an electronic version of all equipment manuals and data sheets, along with any software back-up of configuration files, on CDROM or DVD. Electronic documents shall be supplied in Adobe Acrobat format.
- 2) Provide electronic files for all custom-developed manuals including training manuals. Text shall be supplied in both Microsoft Office format and Adobe Acrobat format.
- 3) Provide electronic files for all drawings produced. Drawings shall be in AutoCAD ".dwg" format and in Adobe Acrobat format. Drawings shall be provided using the AutoCAD eTransmit feature to bind external references, pen/line styles, fonts, and the drawing file into individual zip files.
- 4) Each computer system hardware device shall be backed up onto CDROM or DVD after Substantial Completion and shall be turned over to the Owner.
- 5) If specified in the training section, provide digital copies of all training videos. Videos shall be in a format that is readable by standard DVD players and by standard PC DVD drives. Format shall be a minimum of 800 by 600 pixels and shall include sound.

2. The cover and edge of each volume shall contain the information as specified in 01730.

1.04 COORDINATION MEETINGS

- A. Schedule the mandatory coordination meetings as described herein. The meetings shall be held at the Owner's designated location and shall include attendance by the Owner, the Engineer, the Contractor, the PCSS's Project Engineer. Other Division 13 specifications may require additional meetings. Prepare and distribute an agenda for this meeting a minimum of one week before the scheduled meeting date. Meeting shall be scheduled a minimum of one week before the requested meeting date.
 1. A project kickoff coordination meeting shall be held to discuss the PCSS's Project Plan, to summarize the PCSS's understanding of the project; discuss any proposed substitutions or alternatives; schedule testing and delivery deadline dates; provide a forum to coordinate

hardware and software related issues; and request any additional information required from the Owner. The meeting will last up to one business day.

1.05 REFERENCE STANDARDS

- A. Publications are referred to in the text by basic designation only. Where a date is given for reference standards, that edition shall be used. Where no date is given for reference standards, the latest edition in effect at the time of bid opening shall apply.
- B. International Society of Automation (ISA)
 - 1. ISA S5.2 Binary Logic Diagrams for Process Operations
 - 2. ISA S5.3 Graphic Symbols for Distributed Control/Shared Display Instrumentation Logic and Computer Systems.
 - 3. ISA S5.4, Instrument Loop Diagrams.
 - 4. ISA S20, Specification Forms for Process Measurement and Control Instruments, Primary Elements and Control Valves.
 - 5. ISA RP60.3, Human Engineering for Control Centers
 - 6. ISA RP60.6, Nameplates, Labels, and Tags for Control Centers
 - 7. ISA-99, Industrial Automation and Control Systems Security
- C. National Electrical Manufacturers Association (NEMA)
- D. National Fire Protection Agency (NFPA)
 - 1. NFPA 70, National Electrical Code (NEC).
 - 2. NFPA 79, Industrial Control Equipment.
- E. Underwriters Laboratories, Inc. (UL)
 - 1. UL 508 - Industrial Control Equipment - for custom fabricated equipment
 - 2. A nationally recognized testing laboratory, as approved by the Authority having jurisdiction, may substitute for UL listing on commercial off the shelf products.

1.06 QUALITY ASSURANCE

- A. The PCSS shall be:
 - 1. Sanders Company INC.
2816 SE Monroe St.
Stuart, FL 34997
Ph: 772-220-2900
schafer@sanderscompany.com

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery, storage, and handling shall be in accordance with Section 01600.
- B. Shipping Precautions
 - 1. After completion of shop assembly, factory test and approval of all equipment, cabinets, panels and consoles shall be packed in protective crates and enclosed in heavy duty (5 mil) polyethylene envelopes or secured sheeting to provide protection from damage, dust and moisture. Dehumidifiers shall be placed inside the polyethylene coverings. The equipment shall then be skid-mounted for final transport. Lifting rings shall be provided for moving without removing protective covering. Boxed weights shall be shown on shipping tags together with instructions for unloading, transporting, storing and handling at the job site.
 - 2. Manufacturer's special instructions for field handling, storage and installation required for protection, shall be securely attached to the packaging for each piece of equipment prior to shipment. The instructions shall be stored in resealable plastic bags or other means of protection.
 - 3. If any apparatus has been damaged, such damage shall be repaired at no additional cost to the owner.

1.08 NOMENCLATURE AND IDENTIFICATION

- A. Field Instrument Tags
 - 1. See Section 13340.

1.09 WARRANTY

- A. Provide warranty per Section 01740, Warranties and Bonds, and as specified herein.

1.10 PROJECT/SITE REQUIREMENTS

- A. Environmental Requirements. Refer to Section 16000 and Electrical Drawings for specific environmental and hazardous area classifications.
- B. Elevation: Equipment shall be designed to operate at the project ground elevation.
- C. Temperature:
 - 1. Outdoor areas' equipment shall operate between -30 to 50 C degrees ambient.
 - 2. Equipment located in indoor locations shall operate between 10 to 35 C degrees ambient minimum.
 - 3. Storage temperatures shall range from 0 to 50 C degrees ambient minimum.

4. Additional cooling or heating shall be furnished if required by the equipment as specified herein.
- D. Relative Humidity. Air conditioned area equipment shall operate between 20 to 95 percent relative, non-condensing humidity. All other equipment shall operate between 5 to 100 percent relative, condensing humidity.

PART 2 PRODUCTS

2.01 GENERAL

- A. All instrumentation and electronic equipment shall be of the manufacturer's latest design, utilizing printed circuitry and epoxy or equal coating to prevent contamination by dust, moisture and fungus. The field mounted equipment and system components shall be designed for installation in dusty, humid and slightly corrosive service conditions.
- B. All instruments shall be provided with mounting hardware and floor stands, wall brackets, or instrument racks unless otherwise noted. Fasteners for securing control panels and enclosures to walls and floors shall be either hot-dipped galvanized after fabrication or stainless steel. Provide stainless steel fasteners only in corrosive areas rated NEMA 4X on the Drawings or as defined under Section 16000. Provide minimum size anchor of 3/8-inch.
- C. All indicators shall be linear in process units, unless otherwise noted. All transmitters shall be provided with indicators in process units, accurate to two percent or better.
- D. All equipment, cabinets and devices furnished shall be heavy-duty type, designed for continuous industrial service. The system shall contain similar products of a single manufacturer, and shall consist of equipment models, which are currently in production. All equipment provided shall be of modular construction and shall be capable of field expansion.
- E. All electronic/digital equipment shall be provided with radio frequency interference protection.
- F. Electrical
 1. Equipment shall operate on a 60 Hertz alternating current power source at a nominal 120 volts, plus or minus 10 percent, except where specifically noted. Regulators and power supplies required for compliance with the above shall be provided between power supply and interconnected instrument loop. Where equipment requires voltage regulation, constant voltage transformers shall be supplied.
 2. With the exception for field device network connected devices, all electronic instrumentation shall utilize linear transmission signals of isolated 4 to 20 mA DC (milliampere direct current) capable of driving a load up to 750 ohms, unless specified otherwise. However, signals between instruments within the same panel or cabinet may be 1-5 VDC (volts direct current).
 3. Outputs of equipment that are not of the standard signals as outlined, shall have the output immediately raised and/or converted to compatible standard signals for remote transmission. No zero based signals will be allowed.

4. All switches shall have double-pole, double-throw contacts rated at a minimum of 600 VA, unless noted otherwise.
5. Switches and/or signals indicating an alarm, failure or upset condition shall be wired in a fail-safe manner. A fail-safe condition is an open circuit when in an alarm state.
6. Materials and equipment shall be UL approved whenever such approved equipment and materials are available.
7. All equipment furnished shall be designed and constructed so that in the event of power interruption, the systems specified herein shall go through an orderly shutdown with no loss of memory, and shall resume normal operation without manual resetting when power is restored, unless otherwise noted.

2.02 ELECTRICAL SURGE PROTECTION

- A. General - Surge protection shall be provided to protect the electronic instrumentation system from induced surges propagating along the signal and power supply lines from lightning, utility, or the plant electrical system. The protection systems shall be such that the protective level shall not interfere with normal operation, but shall be lower than the instrument surge withstand level. Protection shall be maintenance free and self-restoring. Devices shall have a response time of less than 50 nanoseconds and be capable of handling a discharge surge current (at an 8x20μs impulse waveform) of at least 8 kA. Ground wires for all instrumentation device surge protectors shall be connected to a low resistance ground in accordance with Section 16660.
- B. Provide protection of all analog signal (4-20 mA) circuits. Circuits shall be protected at both the transmitter and the RTU. Protection devices located near the transmitter shall be mounted in a separate NEMA 4X stainless steel enclosure (plastic is not acceptable) or conduit mounted,, and shall be Phoenix Contact PT Series, MTL Surge Technologies (Telematic) TP48, Citel TSP-10 series, or equal. Substitution of a single device to protect both 120 VAC and 4-20 mA wires to an instrument is acceptable. Protection devices in control panels shall be MTL Surge Technologies (Telematic) SD Series, Phoenix Contact PT Series, Citel DLA series, or equal.
- C. Provide protection of all 120 VAC power feeds into control panels, instruments, and control room equipment. Surge arresters shall be Transtector ACP-100BW Series, Phoenix Contact "Mains-PlugTrab", MCG Surge Protection 400 Series, Citel DS40 series, or equal.
- D. RF Coaxial Cable – Provide protection on communication cables between radios and antennas, mounted either inside the panel, or in the wall of the enclosure in accordance with NEMA and UL standards. Surge protection devices shall be Citel P8AX series, Polyphaser, or equal.
- E. Inductive Loads – Provide coil surge suppression devices, such as varistors or interposing relays, on all process controller outputs or switches rated 120 VA or less that drive solenoid, coil, or motor loads.

2.03 SPARE PARTS

- A. All spare parts shall be wrapped in bubble wrap, sealed in a polyethylene bag complete with dehumidifier, then packed in cartons and labeled with indelible markings. Complete ordering information including manufacturer's contact information (address and phone number), part name, part number, part ordering information, and equipment name and number(s) for which

the part is to be used shall be supplied with the required spare parts. The spare parts shall be delivered and stored in a location directed by the Owner or Engineer.

- B. Furnish one of each type of installed Surge protection devices.
- C. Instrument related Spare Parts - see the Instrument section 13340.

2.04 TEST EQUIPMENT

- A. Provide all test equipment, instruction manuals, carrying/storage cases, unit battery charger, special tools, calibration fixtures, cord extenders, patch cords, test leads, and miscellaneous items for checking field operation of all supplied equipment.
- B. All test equipment shall be wrapped in bubble wrap, sealed in a polyethylene bag with a dehumidifier, then packed in cartons and labeled with indelible markings. Complete ordering information including manufacturer's part number, and equipment name shall be supplied. The test equipment shall be delivered and stored in a location directed by the Engineer.
- C. As a minimum, furnish the following test equipment:
 - 1. One complete electronic process calibrator sets with rechargeable batteries, cases, spare fuses, test leads, and PC based software. Provide model 830 as manufactured by Altek, or equal.
 - 2. One (1) portable digital multi-meter (DMM) with rechargeable battery and test leads, and carrying case, Fluke 289 Industrial Digital Multimeter, or equal. Combining the features of the electronic process calibrator and the DMM such as the Fluke 787 Process meter is acceptable.

PART 3 EXECUTION

3.01 GENERAL INSTALLATION

- A. Instrumentation and accessory equipment shall be installed in accordance with manufacturer instructions. The indicated locations of equipment, transmitters, alarms and similar devices indicated are approximate only. Exact locations of all devices shall be as approved by the Engineer during construction. Obtain in the field, all information relevant to the placing of process control equipment and in case of interference with other work, proceed as directed by the ENGINEER and furnish all labor and materials necessary to complete the work in an approved manner at no additional cost to the Owner.
- B. Provide brackets and hangers required for mounting of equipment.
- C. The shield on each process instrumentation cable shall be continuous from source to destination and be grounded at only one ground point for each shield.
- D. Investigate each space in the building through which equipment must pass to reach its final location. If necessary, ship material in sections sized to permit passing through restricted areas in the building. Provide on-site service to oversee the installation, the placing and location of system components, their connections to the process equipment panels, cabinets and devices, subject to the Engineer's approval. Certify that field wiring associated with the equipment is

installed in accordance with best industry practice. coordinate work under this section with that of the electrical work specified under applicable Sections of Division 16.

- E. Provide sunshades for equipment mounted outdoors in direct sunlight. Sunshades shall include standoffs to allow air circulation around the cabinet. Orient equipment outdoors to face to the North or as required to minimize the impact of glare and ultraviolet exposure on digital readouts.

3.02 TESTING

A. TESTING (GENERAL)

1. All testing requirements under this section shall be provided for the new lift station. All finalized testing documentation shall be submitted within 30 days of each completed test.
2. The PCSS shall test all Instrumentation equipment at the factory prior to shipment. Unless otherwise specified in the individual specification sections, all Instrumentation equipment provided by the PCSS shall be tested at the factory as a single fully integrated system.
3. As a minimum, the testing shall include the following:
 - a. Operational Readiness Tests (ORT).
 - b. Functional Demonstration Tests (FDT).
4. Each test shall be in the cause and effect format. The person conducting the test shall initiate an input (cause) and upon the system's or subsystem's producing the correct result (effect), the specific test requirement will have been satisfied.
5. All tests shall be conducted in accordance with prior Engineer- approved procedures, forms and checklist. Each specific test to be performed shall be described and a space provided after it for signoff by the appropriate party after its satisfactory completion.
6. Copies of these signoff test procedures, forms and checklists will constitute the required test documentation.
7. Provide all special testing materials and equipment. Wherever possible, perform tests using actual process variables, equipment, and data. Where it is not practical to test with real process variables, equipment and data, provide suitable means of simulation. Define these simulations techniques in the test procedures.
8. The Contractor shall require the PCSS to coordinate all of his/her testing with him, all affected Subcontractors, and the Owner.
9. The Engineer reserves the right to test or retest all specified functions whether or not explicitly stated in the prior approved Test Procedures, listed under paragraph 3.02C.
10. The Engineer's decision shall be final regarding the acceptability and completeness of all testing.

11. No equipment shall be shipped until the Engineer has received all test results and approved the system is ready for shipment.
12. The PCSS shall furnish the services of servicemen, all special calibration and test equipment and labor to perform the field tests.

B. FIELD TESTING - OPERATIONAL READINESS TEST (ORT)

1. The purpose of the ORT is to check that the process equipment, instrument installation, instrument calibration, instrument configuration, field wiring, control panels, and all other related system components are ready to monitor and control the processes. This test will determine if the equipment is ready for operation.
2. This test shall take place prior to FDT and startup. Prior to starting this test, relevant process equipment shall be installed and mechanically tested, instruments installed, control panels installed, and field wiring complete.
3. Required Documents for Test
 - a. Master copy of the PCSS developed field testing signoff forms.
 - b. Testing procedures.
 - c. Calibration forms.
4. These inspections, calibrations, and tests do not require witnessing. However, the Engineer may review and spot-check the testing process periodically. Any deficiencies found shall be corrected by the PCSS prior to commencement of the Functional Demonstration Test.
5. The PCSS shall maintain the Sign-off forms and the Calibration forms at the job site and make them available to the Engineer/Owner at any time.
6. The following tests shall be performed as part of the ORT:
 - a. Input/Output (I/O) Testing to the HMI.
7. I/O Testing
 - a. The purpose of the I/O testing is to check that the process equipment, instrument installation, calibration, configuration, field wiring, and the control panels are set-up correctly to monitor and control the processes. This test is commonly referred to as a "loop test" or an I/O checkout.
 - b. PCSS in conjunction with the contractor shall test signals under process conditions. The preferred test method will always be to execute the test wherever possible to the end elements. For example, the preferred test will prove valve open/close limit switches by operating the valve, not by installing a jumper on the limit switch contacts. However if the equipment or process is not available to test a signal over its entire calibrated range, the PCSS may test using a simulation methods and make a note on the sign-off form.

- c. The following I/O tests shall be performed:
 - 1) Discrete Input – At the device or instrument, change signal condition from the inactive to active state. Observe results on all indicators within the loop such as the HMI screens, pilot lights, horns, beacons etc.
 - 2) Analog Input – Test the analog signal over the entire engineering range at various intervals including 0, 50%, and 100% as well as on increasing and decreasing range. Observe results on all indicators within the loop such as the HMI screens, digital indicators, etc.
 - 3) Discrete output signals shall be tested by switching the equipment to manual control at the HMI nodes and turning the output on or using other means to turn the output on. Then verify the equipment responds accordingly.
 - 4) Analog output signals shall be tested by switching the equipment to manual control at the HMI nodes and turning the output on or other means to turn the output on. Then verify the equipment responds accordingly.
- d. Repeat all systems tests specified under factory testing.
- e. Upon successful completion of the ORT, the PCSS shall submit a record copy of the test results as specified in Part 1 and request the scheduling of the FDT.

C. FIELD TESTING - FUNCTIONAL DEMONSTRATION TEST (FDT)

- 1. After the pressure reducing station is in automatic control to the extent possible, a Functional Demonstration Test shall be performed. The purpose of the FDT is to allow the Engineer and/or Owner representatives to witness the actual functionality, performance, and stability of the system while connected to the process equipment.
- 2. Required Documents for Test
 - a. Set of panel drawings and wiring diagrams from ORT with corrections noted
 - b. Set of contract documents - all drawings and specifications.
 - c. All design change related documentation.
 - d. Signed-off master copy of the PCSS developed field testing signoff forms.
 - e. Testing procedures.
 - f. Copy of completed calibration forms.
 - g. One copy of all O & M Manuals for PCSS supplied equipment.
- 3. Punchlist items and resolutions noted during the test shall be documented on the Punchlist/Resolution form. In the event of rejection of any part or function test procedure, the PCSS shall perform repairs, replacement, and/or retest within 10 days. Upon successful

completion of the FDT, the PCSS shall submit a record copy of the test results as specified in "Part 1-General".

END OF SECTION

SECTION 13306

I&C – Applications Engineering Services

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Refer to section 13300.
- B. If referred to anywhere else in the project manual, Application Engineering (AE) or Applications Engineering System Supplier (AESS) services are those services specified in this section.
- C. Provide all programming, configuration, and related services required to achieve a fully integrated and operational system as specified herein. All equipment shall be controlled in full conformity with the contract drawings, process control descriptions, specifications, engineering data, instructions, and recommendations of the equipment manufacturer. Coordinate the control system for proper operation with related equipment and materials furnished by other suppliers under other Sections of these specifications and with related existing equipment.
 - 1. Provide configuration of the RTU. Refer to process and instrumentation diagram for further detail.
 - 2. Provide configuration of the existing HMI System Software for monitoring and control of the new pressure reducing valve and flow metering station.
 - 3. Provide for and test communications and functionality between all connected devices (such as PLCs) and the HMI software packages, including devices supplied by others, as depicted on the system architecture drawings in order to provide a comprehensive working system of data collection, storage and reporting.

1.02 RELATED WORK

- A. Refer to Section 13300.

1.03 SUBMITTALS

- A. Provide all required submittals in accordance with Section 01300, Submittals. The submittals listed below shall be provided as a minimum.
 - 1. Controller Program
 - 2. Software Maintenance documentation
 - 3. Operations and Maintenance Manuals
- B. Controller Program Submittal
 - 1. For each controller, submit the following using the controller manufacturer's built in printing functions. Electronic submission of Adobe Portable Document Format ("pdf")

files in lieu of paper submittals is acceptable. Review will be for general program organization, level of documentation, and overall programming standards (basic pump and valve control, for example). The review will not attempt to confirm the logic works correctly for every loop.

- a. PLC programs showing ladder logic, function block, high level language or other controller language used. Include individual rung, network, and/or command descriptions with abundant comments to clearly identify function and intent of each code segment. Each logic segment shall be clearly presented, the function of each timer described, the purpose of each subroutine call labeled and defined, etc. Program documentation shall be sufficiently clear to allow determination of compliance with the process control requirements included in the control descriptions and with the Drawings. The submittal shall demonstrate that all logic provided under this project follows the same structure and format and reflects a common programming approach.
2. Submit details of control system communication. Submit a "memory map" or other means showing which signals are exchanged between PLCs. Also submit a HMI tag database showing all signals exchanged between the PLCs and HMI. Any specific communication block memory addresses shall be defined.

C. O&M Manuals - Software Maintenance Manuals

1. Include these manuals as part of 13300 "Final System Documentation". This required information is in addition to any requirements of Section 13300.
2. Software Listings and Databases- Submit hard copies of the same information required in the "Controller Program Submittal" except include files updated to reflect the as built system. Include PDF versions of these files in the CD specified below.
3. Machine Readable Documentation - Provide two sets of as built software documentation on CD-ROMs in original electronic format for the RTU. Any changes made during or after testing, start-up, and commissioning shall be incorporated.

D. O&M Manuals - Operator Manuals

1. Provide Operator's Manuals prior to final acceptance of the system.
2. These manuals shall be separately bound and shall contain all information necessary for the operator to monitor and control the pressure reducing valve and flow meter from the control system. The manuals shall be written in non-technical terms and shall be organized for quick access to each detailed description of the operator's procedure. Manuals shall contain, but not be limited to, the following information:
 - a. A comprehensive table of contents of the manual.
 - b. A simple overview of the entire system indicating the function and purpose of each piece of equipment.
 - c. A detailed description of the operation of the HMI including all appropriate displays. Including a screenshot of each HMI screen and annotating each function in text is an acceptable format for presenting this information.

- d. Step-by-step procedures for starting up or shutting down an individual component of the control system and also of the entire system.
 - e. Login / logout procedures.
 - f. Complete, step-by-step procedures for printing reports and entering manual data.
 - g. Complete, step-by-step procedures for performing system or selected file backup and restoration including archiving historical data. Include recommended archiving schedule for historical data.
 - h. Operational description for operating HMI computer equipment and peripherals including printers, CD-ROMs, removable bulk storage devices, UPS, etc. Description shall include procedures for typical maintenance and troubleshooting tasks.
 - i. A complete glossary of terms and definition of acronyms.
 - j. List of personnel to be contacted for warranty and emergency services, including name, address, telephone number, pager or cell phone number, fax number, and email address
- 3. Include these manuals as part of 13300 "Final System Documentation". This required information is in addition to any requirements of Section 13300.

1.04 MAINTENANCE

- A. Refer to section 13300.

1.05 WARRANTY:

- A. Refer to Section 13300 and supplement that with the requirements below.
- B. All application work shall be warranted in accordance with Section 01740

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 GENERAL

- A. The system specified herein shall perform the following generalized functions:
 - 1. The system shall allow the operator to control and monitor equipment at the pressure reducing valve and flow metering station.
 - 2. Perform real-time process control, including proportional integral derivative control action, sequencing, process calculations, etc.

3. Collect, calculate, and store accurate, reliable operating information for present and future uses.
4. Assist remote site operating personnel by noting and communicating off normal operating conditions and equipment failures.
5. Provide trending for all analog values.
6. Provide control system diagnostics.
7. The system shall allow the operator to manually control (by keyboard entry and mouse type pointing device) the status of pumps, valves, etc. (i.e., on off, open close, setpoint value, etc.) when viewing the appropriate graphic screen on the HMI.

3.02 CONTROLLER PROGRAMS

- A. All applications programs shall be developed in a structured manner and shall follow an intuitive arrangement so that an instrumentation technician with basic programming knowledge will be able to understand. Programs shall utilize standard program templates or subroutines for repetitive logic such as equipment control, flow total calculations, equipment runtime calculations.
- B. Make changes to the application programs and software configuration, based on comments during the submittals, the factory tests, the field tests, and during the commissioning process to meet the design intent, at no additional cost to the Owner.

3.03 GRAPHIC DISPLAYS - GENERAL

- A. All displays shall contain and continuously update the displayed process variables, date and time of day. All process values shall be displayed in engineering units. All displays shall incorporate references to both instrumentation tag numbers and equipment numbers. All process variables shall be displayed on their associated display(s) with correct engineering units. Process variables shall display their associated data quality flags.
- B. All operator commands related to controlling field devices or system attributes shall require multiple keystrokes or mouse actions to protect against inadvertent operations. The operator shall receive confirmation of the selected point to be controlled, at which time a cancellation of the control can be affected.
- C. Process graphic displays, shall be based on the P&ID's, site plan drawings, mechanical drawings and electrical drawings included in these Contract Documents. The graphic displays shall depict process flow streams, process structures, and all major items of process equipment and control devices in a schematic format.
- D. All main graphical screens shall include a title bar, main graphic area, navigational buttons, and alarm summary bar. Title bar shall be displayed on the top of each screen and include display name, description and time/date. The main graphical area shall contain primary screen data in graphical format. Navigational buttons shall include a minimum of main menu, trends, main alarm summary, and security log in. The alarm summary bar shall display the last three valid alarms on the bottom of each screen.

- E. Animation shall be provided to mimic level changes in tanks or vessels, and to mimic rotation of rotating equipment when running. Valve colors shall change when opened and closed.
- F. Unless specifically noted, all timers, setpoints, alarm actuation levels, etc., shall be adjustable from the operator interface.
- G. The system shall show field conditions with text that can alternate (i.e., OPEN/CLOSE, START/STOP, HIGH/LOW) and change color correspondingly. Field devices that are tri state must be represented in three conditions.
- H. Conditions in the field designated as alarm conditions shall report to the operator workstation, actuate an audible alarm, and provide a visual blinking image on the associated graphic page. All alarms and events should be displayed on the screen and archived.
- I. All interlocks that affect equipment operation shall be identified both by alarm and by HMI indication.
- J. All analog inputs shall be checked for out of range (via high and low limit checks) and alarmed.
- K. All process flow streams shall be labeled and color coded using the project color schedule in Division 9. All structures and equipment shall be identified by name and appropriate equipment and loop tags.
- L. Color coding for equipment status and alarms shall be as follows:
 - 1. Red for on or open.
 - 2. Green for off or closed.
 - 3. Active, unacknowledged alarms are indicated by flashing amber.
 - 4. Active, acknowledged alarms are indicated solid amber.
- M. Automatically record all alarm and events should any of the following sequences or events occur:
 - 1. Date/Time entry
 - 2. Limit changes
 - 3. Any commanded or uncommanded change of any point
 - 4. Alarm conditions
 - 5. PLC activation or deactivation
 - 6. Operator login or logout activity

3.04 SECURITY

- A. The system shall be configured and implemented with security to prevent unauthorized access. The system shall allow authorized changes to system operation through defined user accounts and password verification.
- B. Coordinate with Owner user account information, including login name and password for each account.
- C. Security levels of "display only", "operator mode", "supervisor mode", and "engineer mode" shall be available through assignable passwords. On system startup, the "display only" security level shall automatically be entered. In the "display only" mode, information is available to be displayed on the screen but no changes may be made. In the "operator mode", changes may be made to process set points, times, etc.; however, the overall control concepts may not be modified. In the "supervisor mode", all operator functions can be modified and any special reports or critical process set points (data can be modified; however, the overall control concepts may not be modified). In the "engineer mode" level, all user modifiable parameters of the system shall be available for modification.

END OF SECTION

SECTION 13310

CONTROL SYSTEM & RADIO TELEMETRY EQUIPMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. For additional Scope of Work, refer to specification section 13300.
- B. The new pressure reducing station and flow metering station requires a communication link to connect to the existing system SCADA system for monitoring. The communication links are to be established using the existing frequency and technology in use by the City for monitoring. The PCSS shall configure and program the new RTU to allow communication to the existing system.
- C. The Contractor shall furnish and install all radio telemetry equipment hereinafter specified to perform the intended function. Work shall include all necessary materials, Equipment, labor and services.
- D. All Equipment furnished under this Specification Section shall be the responsibility of the Contractor. The Contractor shall assume responsibility for the complete radio telemetry including radios, antennas, and all cabling and surge suppression. This shall include system testing and installation.

1.02 RELATED WORK

- A. Refer to Section 13300.

1.03 COORDINATION MEETINGS

- A. Refer to Section 13300.

1.04 SUBMITTALS

- A. Refer to Section 13300.
- B. Survey Report

1.05 REFERENCE STANDARDS

- A. Refer to Section 13300.
- B. The design, testing, assembly, and methods of installation of the wiring materials, electrical equipment, and accessories proposed under this contract shall conform to the National Electrical Code and to applicable state and local requirements. UL listing and labeling shall be adhered to under this contract.
- C. Any equipment that does not have a UL, FM, CSA, or other approved testing laboratory label shall be furnished with a notarized letter signed by the supplier stating that the equipment

furnished has been manufactured in accordance with the National Electric Code and OSHA requirements.

- D. Any additional work needed resulting from any deviation from the codes or local requirements shall be at no additional cost to the Owner.

1.06 QUALITY ASSURANCE

- A. Refer to Section 13300.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 13300.

1.08 MAINTENANCE

- A. Test Equipment – The following shall be provided:

- 1. Refer to Section 13300.

- B. Spare Parts - The following shall be provided:

- 1. Refer to Section 13300.

1.09 FINAL SYSTEM DOCUMENTATION

- A. Refer to Section 13300.

PART 2 PRODUCTS

2.01 SYSTEM REQUIREMENTS

- A. Configure a system consisting of a 150-174 MHz radio located at the pressure reducing station and flow metering station which will communicate with the existing system.
- B. The RTU panel shall include all equipment; radio, transmission line, power supply, wiring, operator interface terminal and connectors required for operation.
- C. The RTU is to perform under conditions ranging between minus 30 degrees C and plus 60 degrees C, and humidity range of 0 to 95 percent, non-condensing.

2.02 REMOTE TELEMETRY UNIT

- A. RTU shall be a pre-engineered product :
 - 1. Serial communication port with built-in support for Modbus RTU, Modbus TCP and DNP protocols
 - 2. 10/100 Mbps Ethernet communication port
 - 3. Report-by-exception communications as a standard feature
 - 4. Modbus Store and Forward capability

5. I/O Configuration shall at the minimum meet the following:
 - a. Qty. (16) Digital Inputs (DI)
 - b. Qty. (4) Digital Outputs (DO)
 - c. Qty. (8) Analog Inputs (AI)
6. All digital outputs shall be solid state, open drain MOSFET and shall operate on a 10-30 VDC external source, capable of sinking 400 mA @ 30VDC
7. All analog inputs shall have 14-bit resolution with 250Ω input impedance and shall be externally sourced, single ended inputs.
8. Power: 120 VAC
9. UPS shall be selected to accommodate appropriate input and output voltages.
10. 150-174 MHz Radio, as specified in Section 2.03
11. RTU shall be provided with operator interface terminal for monitoring and controlling parameters.
12. RTU shall be Siemens LC3000.

2.03 RADIO SPECIFICATION

- A. The 150-174 MHZ radios shall operate under FCC Part 15 rule for licensed radio operation in MHZ band to match Owner existing frequency.
- B. The following general requirements shall be met by the radio:
 1. The radio shall use existing license frequency:
 - a. 154.45625 MHZ
 2. Agency Approvals: FCC Part 15.247, FM
 3. Environmental: Full performance minus 30 to plus 60C
 4. Power Requirements: The radio shall be supplied with converters for operation at 120 Vac.
 5. Data Latency: The radio shall not add more than 10 ms to each data transmission due to radio and data control overhead.
- C. The radio transmitter shall meet the following requirements:
 1. Frequency Range: 150-174 MHZ
 2. Output Power: 30 dbm, continuous duty cycle

- 3. Frequency Stability: Plus/minus 2.5 parts per million
- 4. Bandwidth Modulation: Meets FCC part 15.247
- 5. Transmitter Keying: Data activated

D. The Radio shall allow the following configurations:

- 1. Access Point.
- 2. Remote Dual Gateway
- 3. Configurable by customer as access point or dual gateway (serial and Ethernet/IP connections)
- 4. Remote Serial Gateway through serial ports connections
- 5. Remote Ethernet Bridge using Ethernet connection with multidrop capability

E. Physical Interface

- 1. Ethernet 10BaseT, RJ-45
- 2. Serial RS-232/V.24, DB-9F, DCE
- 3. Antenna TNC connector (female)
- 4. LEDs LAN, Com1, Com2, Power, Link

F. Protocols

- 1. IP (DHCP, ICMP, UDP, TCP, ARP)
- 2. Multidrop protocols including Modbus RTU and Modbus TCP

2.04 RADIO DIAGNOSTIC SOFTWARE

- A. Radio configuration and diagnostics system shall be furnished with the radio system. This diagnostic software shall be manufactured by the radio manufacturer. The system shall provide configuration capabilities to set up and modify, if necessary, the operating parameters of each radio, and provide diagnostic features to test system performance. The system shall be integral to each radio and include a centralized computer software package for a Personal Computer running Windows operating system.
- B. The radio system shall include diagnostic capabilities that enable the user to reconfigure the system in the field. Diagnostics must also monitor system communications and provide statistics on communications performance and throughput.

2.05 ANTENNAS AND MASTS

- A. Antenna and mast shall be provided and configured for radio telemetry. Antenna shall be yagi-directional Antenna frequency range shall be 150-174 MHZ.
- B. The antennas shall be fabricated of 6061/T6 aluminum rod and seamless drawn pipe, anodized for maximum reliability and corrosion resistance. The hardware and fastenings shall be stainless steel. Rated wind velocity shall be 150 mph (nominal); 180 mph (max). Yagi-directional antennas shall be model number TY-900 as manufactured by SCALA or Approved Equal.
- C. Antenna mast shall be self-supporting. Mast manufacturers shall be Hapco, RTA Series; Valmont, or approved equal.
- D. Antenna mast shall be fabricated of 2" stainless steel.
- E. Antenna to be removed shall remain property of the owner.

2.06 ANTENNA CABLE ASSEMBLY

- A. Antenna cable assemblies shall be provided and installed between the antenna and the radio. The cable shall be configured so as to be compatible with the radio and antenna to be furnished under this Contract. Cable lengths will be determined by coordinating with the Owner as to the antenna, mast, and tower locations and the location of the enclosures in which the radio is installed.
- B. Each antenna cable assembly shall consist of foam-insulated coaxial cable, connectors, grounding kit, surge protector, jumper cables, and tower clamps as required for a complete operational communications link.
- C. Cable assemblies shall be provided and installed, complete with cable connector and fastening hardware for all antennas.
- D. Cable Size
 - 1. Less than 100 ft. (30m) in length: ½ inch (13mm) diameter minimum
 - 2. 100 ft. to 200 ft. (30m to 60m) in length: 7/8 inch (22mm) diameter minimum
 - 3. Greater than 200 ft. (60m) in length: 1-5/8 inch (41mm) diameter minimum
- E. Cable Installation
 - 1. The cable shall be grounded at three locations;
 - a. At the antenna location (ground to tower).
 - b. At the point the cable leaves the tower (ground to tower).
 - c. At the radio equipment location (ground to the existing system ground).
 - 2. Furnish and install ground rod and ground wire as shown on drawings.

3. Install surge protective devices at each end of all antenna cable provided.
4. Wrap all outdoor coaxial connectors with the cold shrink weatherproofing kit manufactured by Andrew Corporation. Provide one kit for each outdoor connection.
5. Provide grounding kits, two for each antennae installation (top and bottom), manufactured by Andrew Corporation.
6. Provide Snapstak™ Hanger (mounting clamps) for coax cable, two per every stand-off adapters (SA-38), for the cable supplied. Snapstak™ Hangers shall be manufactured by Andrew Corporation or approved equal.
7. Provide coax connectors, one on each end of Coax cable. Connectors shall be manufactured by Andrew Corporation or approved equal.
8. Furnish a single continuous piece of coaxial cable for the main runs of cable; splicing is not acceptable.
9. Radio antenna cable, manufactured by Andrew Corporation or equal, shall meet the following requirements:

Description

Part No.

HELIAX® Dielectric Coaxial Transmission Cable

LDF5-50A

10. Radio antenna cable size, as indicated above, is based on the estimated tower heights specified herein. The diameter of the coaxial cable shall be adjusted to the correct size based on the results of the radio path study but shall be of the same manufacture as the cables listed above.

2.07 RADIO PERFORMANCE

- A. RTU radio performance shall fulfill the following criteria:
 1. RSSI: Equal or greater than the indicated on the radio survey.
 2. Receive errors: Less than 5%
 3. Packets dropped: Less than 5%
 4. Packets received by zone: This value should be similar for the entire use zone with no more than 2% of reduction in the zone with less use
 5. Packet statistics: The difference between the wireless sent and received packets should be no more than 10% of their Ethernet (data) counterpart

2.08 LIGHTNING/SURGE PROTECTION

- A. Lightning surge protection shall be provided for all antenna installations, and shall be of the coaxial impulse suppressors combined with AC line protectors. Lightning surge protectors

shall be manufactured by Polyphaser or Approved Equal.

- B. The grounding of the antenna assemblies shall be checked for the antenna, mast, supports, and where applicable, towers.
- C. Grounding: Provide coaxial grounding kit for each radio.
- D. RF Surge Protector: Provide one in-line coaxial for each feed line near radio.
- E. Data line surge protection: Provide surge protection for the communication line.

PART 3 EXECUTION

3.01 GENERAL INSTALLATION

- A. The Contractor shall furnish labor, materials, equipment, and incidentals required to install the system in accordance with specification section 13300 and as specified herein. The Contractor shall configure and program the RTU to perform as defined by the contract documents.
- B. The Electrical Contractor shall be responsible for ensuring that field wiring for power and signal circuits is correct and wired in accordance with best industry practice. Also, the Electrical Contractor shall be responsible for providing all necessary system grounding to insure a satisfactory functioning installation.
- C. Install other equipment as shown in the Contract Drawings.
- D. Ground antenna cable to the mast at the top and bottom using factory supplied grounding kits.
- E. Weatherproof all antenna cable connections using butyl rubber tape.

3.02 TESTS (GENERAL)

- A. Refer to Section 13300.

3.03 OPERATIONAL READINESS TESTS (ORT)

- A. Refer to Section 13300.

3.04 FUNCTIONAL DEMONSTRATION TEST (FDT)

- A. Refer to Section 13300.

END OF SECTION

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SECTION 13340
INSTRUMENTATION AND CONTROLS – INSTRUMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This section covers the furnishing, installation, and services for instruments.
- B. Refer to Section 13300.

1.02 RELATED WORK

- A. Refer to Section 13300.

1.03 SUBMITTALS

- A. Submit complete documentation of all field instruments using ISA-S20 data sheet formats. Submit a complete Bill of Materials (BOM) or Index that lists all instrumentation equipment. The list shall be sorted by Loop Number. .
- B. Submit separate data sheets for each instrument including:
 - 1. Plant Equipment Number and ISA tag number per the drawings
 - 2. Product (item) name used herein and on the Drawings
 - 3. Manufacturer's complete model number
 - 4. Location of the device
 - 5. Input - output characteristics
 - 6. Range, size, and graduations in engineering units.
 - 7. Physical size with dimensions, enclosure NEMA classification and mounting details in sufficient detail to determine compliance with requirements.
 - 8. Materials of construction for enclosure and wetted parts.
 - 9. Instrument or control device sizing calculations where applicable
 - 10. Certified calibration data for all flow metering devices.
 - 11. Two-wire or four-wire device type as applicable.
- C. Submit catalog cuts for all instruments. Submit descriptive literature for each hardware component, which fully describes the units being provided.

- D. Submit index and data sheets in electronic format as well as hard copies on 8-1/2" x 11" formats. Electronic format shall be in Microsoft Excel or Word. Submit electronic copy on CD-ROM or DVD disk.

1.04 MAINTENANCE

- A. Refer to Section 13300.

1.05 INSTRUMENT TAGS

- A. A permanent stainless steel or other non-corrosive material tag firmly attached and permanently and indelibly marked with the instrument tag number, as indicated in the Drawings, shall be provided on each piece of equipment supplied under this Section and related sections. Equipment shall be tagged before shipping to the site.
- B. Provide 1/8-in by 3/8-in, Type 316 stainless steel button head machine screws.
- C. All supplied instrument transmitters and instrument transmitter elements shall have a stainless steel identification tag attached to each transmitter and element prior to shipment. Tag shall be attached via stainless steel chain or stainless steel wire (24 gauge min) to a non-removable part of the device. The tag size shall be a minimum of 1.5 square inches. Tag shall include the ISA alphanumeric instrument number as indicated in the P&ID, loop, and detail drawings. The alphanumeric instrument number shall be stamped into the tag and shall have a minimum of 3/16-in high alphanumeric characters.

1.06 APPROVALS/CERTIFICATIONS

- A. Instruments for hazardous locations shall have Factory Mutual (FM), Canadian Standards Association (CSA), and CENELEC approvals and certifications as specified herein and as indicated on the Drawings or in the Instrument Device Schedule. The instrument specifications in Part 2 state the Class, Division, and gas groups for FM/CSA approval, followed in parenthesis by the CENELEC certification; however, instruments provided are only required to have the approval/certification stated above. The instrument shall have a stainless steel tag identifying the relevant approval or certification.

PART 2 PRODUCTS

2.01 VENTURI FLOW TUBES

- A. Type:
 - 1. Pressure differential producing type utilizing pure static pressure sensed at the inlet and throat sections. Flow tubes with devices which employ entire or partial pitot effects, or which amplify the differential, are not acceptable.
- B. Function/Performance:
 - 1. Coefficient of Discharge: Greater than 0.98 and constant for pipe Reynolds numbers as low as 75,000.

2. Pressure: Each flow tube shall withstand hydrostatic pressure equal to that specified for the piping system in which the flow tube is to be installed.
3. Accuracy: Plus or minus 0.5 percent of the specified flow rate.
4. Differential Pressure: The beta ratio of the Venturi flowtube shall be selected to minimize unrecovered head loss, while providing a pressure differential of at least 1 inch (25 mm) of water column at the minimum specified flowrate.
5. Unrecovered Head Loss: Unless indicated on the drawings, supply of Venturi flowtubes having one of the standard beta ratios provided by the manufacturer will be acceptable, provided the unrecovered head loss is less than 10 percent of differential pressure.
6. Verify all pipe sizes and coordinate with the Contractor before ordering any flow elements.

C. Physical:

1. Body Material: Cast iron to ASTM A126 Class B or equivalent standard, finished with bitumastic paint.
2. Throat Liner: Bronze.
3. Flanges: ANSI Class 125 or DN flanges as required by the piping system where flow tubes are installed.
4. Construction: Internal cross sections shall be circular with no debris collecting cavities or annular chambers, but shall have static pressure connections at the inlet and throat. Vent and drain ports shall be included on a 90 degree plane to the metering tap on the inlet section.

D. Accessories/Documentation Required:

1. Provide manual vent cleaners where indicated in the Instrument Device Schedule.
2. The flow tube shall be factory calibrated. The calibration data shall be included in the O & M manual.
3. Prior to shipment of the flow tube, the supplier shall submit a certified report that the flow tube has been hydrostatically tested to 1.5 times the maximum working pressure of the pipeline where the flow tube is installed.
4. The supplier shall provide certified documentation from the as to the head loss in inches of water. The supplier shall also provide test data substantiating the value of the discharge coefficient with proof that the coefficient is independent of line size and beta ratio; test data indicating Reynolds number effect and installation effect data for the model of the Venturi flow tube proposed. All test data shall be provided from traceable national standards laboratories.
5. The contractor shall provide straightening vanes where indicated on the Drawings or in the Instrument Device. The vanes shall be of material suitable for the measured fluid and compatible with the piping system provided.

6. Provide an inspection port on all tubes 12-in (300 mm) and larger.
7. Where the flow tube is indicated to be used on potable water service, the interior cast iron surfaces shall be epoxy coated with Tnemec No. 46-272 Topox or an equal coating fully acceptable for potable water service.
8. One set of gaskets suitable for the installation indicated on the Drawings.

E. Manufacturer(s):

1. BIF Model 20181

2.02 DIFFERENTIAL PRESSURE TRANSMITTER FOR FLOW ELEMENTS

A. Type:

1. Microprocessor based, intelligent type to be used with either an orifice plate, venturi, or an averaging pitot tube

B. Function/Performance:

1. Range: Range of the transmitter shall be the standard range of the manufacturer closest to the differential pressure range to be metered.
2. Accuracy: 0.075 percent of span (linear output).
3. Operating Temperature: -4 to 176 degrees F.
4. Temperature Effect: Combined temperature effects shall be less than 0.2 percent of maximum span per 28 degrees C temperature change.
5. Static Pressure Effect: Effect on accuracy due to static pressure changes shall be negligible.
6. Output: 4-20 mA DC adjustable over the instrument range, with HART protocol. The output shall be proportional to the square root of the input differential pressure.
7. Stability: 0.05 percent of upper range limit for 1 year.
8. Display:
 - a. Digital indicator displaying flow in the engineering units indicated in the Instrument Device Schedule.
9. Diagnostics:
 - a. Self-diagnostics with transmitter failure driving output to above or below out of range limits.

- b. Simulation capability for inputs and loop outputs.
 - c. Test terminals available to ease connection for test equipment without opening the loop.
 - d. Registers to record minimum and maximum pressure and temperatures transmitter has been exposed to shall be available.
10. Over Range Protection: Provide positive over range protection to 150 percent of the maximum pressure of the system being monitored by the instrument.

C. Physical:

- 1. Enclosure: Shall be IP-68 rated for Submergence
- 2. Process Wetted Parts: Isolating diaphragm and other wetted metal parts shall be 316L stainless steel, unless otherwise indicated in the device schedule. Gaskets and O rings shall be Teflon.
- 3. Power Supply: 24 VDC loop power.
- 4. Sensor Fill Fluid: Silicone.

D. Power Requirements:

- 1. 24 VDC loop powered instrument.

E. Accessories Required:

- 1. Provide span and zero adjustment at each transmitter and through the handheld programming unit.
- 2. For air and clean water processes, provide a three valve manifold with each transmitter. The manifold shall be 316 stainless steel. Manifolds may be mounted directly to the instrument or separately mounted. Manifolds shall be by the instrument manufacturer or by D/A Manufacturing or Anderson Greenwood.
- 3. For dirty water or sludge applications, each transmitter shall be provide with integral remote armored capillary seals. The seal connection shall match the connection provide at the meter. The fluid in the seal shall meet the temperature requirements in which the meter is located.

F. Manufacturer(s):

- 1. Rosemount 3051.

2.03 GAUGE PRESSURE OR PRESSURE SENSING LEVEL TRANSMITTERS

A. Type:

- 1. Microprocessor based, intelligent type.

B. Function/Performance:

1. Range: Range of the transmitter shall be the standard range of the manufacturer closest to the pressure range to be metered.
2. Accuracy: 0.075 percent of span.
3. Operating Temperature: -20 to 80 degrees C.
4. Temperature Effect: Combined temperature effects shall be less than 0.2 percent of maximum span per 28 degrees C temperature change.
5. Output: 4-20 mA DC linear with pressure or level, with HART protocol. Zero adjustable over the range of the instrument provided calibrated span is greater than the minimum calibrated span.
6. Stability: 0.05 percent of upper range limit for 1 year.
7. Display: Digital indicator displaying pressure or level in the engineering units indicated in the Instrument Device Schedule.
8. Diagnostics:
 - a. Self-diagnostics with transmitter failure driving output to above or below out of range limits.
 - b. Simulation capability for inputs and loop outputs.
 - c. Test terminals available to ease connection for test equipment without opening the loop.
 - d. Registers to record minimum and maximum pressure and temperatures transmitter has been exposed to shall be available.
 - e. Run-time clock available to determine usage for warranty purposes. 5-year warranty on this clock reading is included.
9. Over Range Protection: Provide positive over range protection to 150 percent of the maximum pressure of the system being monitored by the instrument.
10. If required to meet the range or suppression/elevation requirements, a differential pressure transmitter shall be provided.

C. Physical:

1. Enclosure: NEMA 4X (IP66), explosion proof, approved for Class I, Division 1, Groups C and D (EEx d IIC T5).
2. Process Wetted Parts: Isolating diaphragm and other wetted metal parts shall be 316L stainless steel, unless otherwise indicated in the device schedule. Gaskets and O rings shall be Teflon.

3. Power Supply: 24 VDC loop power.

4. Sensor Fill Fluid: Silicone.

D. Accessories Required:

1. Provide span and zero adjustment at each transmitter and through the handheld programming unit.
 - a. Configuration of the transmitter may be accomplished using the local display and pushbuttons without the use of an external programming device.
 - b. NOTE: Siemens, ABB and Foxboro have this capability
2. For each transmitter provide a 316 stainless steel block & bleed shut off valve. Valves may be mounted directly to the instrument or separately mounted. Valves shall be by the instrument manufacturer or by D/A Manufacturing or Anderson Greenwood.

E. Manufacturer(s):

1. Rosemount 3051CG.

2.04 SPARE PARTS AND ACCESSORIES

- A. General requirements for spare parts are specified in section 13300.
- B. The following field Instrument related Spare Parts shall be furnished:
 1. One flow indicating transmitter for each type of flow element provided.
 2. One pressure transmitter for each type provided.
- C. The following accessories shall be furnished:
 1. All mounting hardware required for pipe stand, surface, or other mounting shall be provided.
 2. Each instrument shall be provided with a manufacturer installed stainless steel tag identifying the instrument tag number.

PART 3 EXECUTION

3.01 GENERAL

- A. See execution requirements in Section 13300.
- B. Unless specifically indicated, direct reading or electrical transmitting instrumentation shall not be mounted on process piping. Instrumentation shall be mounted on instrument racks or stands. All instrumentation connections shall be provided with shutoff and drain valves. For differential pressure transmitters, 5-valve manifolds for calibration, testing and blow down service shall

also be provided. For chemical or corrosive fluids, diaphragm seals with flushing connections shall be provided.

END OF SECTION

SECTION 15062

DUCTILE IRON PIPE AND FITTINGS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required, install, and test ductile iron pipe and fittings as shown on the Drawings and as specified herein.
- B. Mechanical piping included under this section shall include all piping and fittings installed above grade, in utility tunnel or gallery and shall exclude yard (buried) piping.
- C. Mechanical piping shall be installed as shown on the Drawings. Provide pipe supports, hangers and couplings as required to achieve a complete pipe system.
- D. Where the word "pipe" is used, it shall refer to pipe, fittings, or appurtenances unless otherwise noted.

1.02 RELATED WORK

- A. Valves and Appurtenances are included in Section 15100.
- B. Buried piping is included in Division 02.

1.03 SUBMITTALS

- A. Submit to the ENGINEER, in accordance with Section 01300, shop drawings and product data required to establish compliance with the Section. Submittals shall include at least the following:
 - 1. Product data for all pipe materials and fittings proposed for use on the project.
 - 2. Tabulated layout drawings showing actual pipe lengths, diameters, fittings and appurtenances.
 - 3. Prior to shipment of pipe, submit a certified affidavit of compliance from the pipe MANUFACTURER stating that the pipe, fittings, gaskets, linings and exterior coatings for this project have been manufactured and tested in accordance AWWA and ASTM standards and requirements specified herein.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A377 - Standard Index for Specification for Ductile-Iron Pressure Pipe
 - 2. ASTM C150 - Standard Specification for Portland Cement.
- B. American National Standards Institute (ANSI)
 - 1. ANSI B1.1 - Unified Inch Screw Threads (UN and UNR Thread Form).
 - 2. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.
 - 3. ANSI B18.2 - Square and Hex Bolts and Screws Inch Series Including Hex Cap Screws and Lag Screws.

- C. American Water Works Association (AWWA)
 - 1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 - 2. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3-In Through 48-In (75mm Through 1200mm) for Water and Other Liquids.
 - 3. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
 - 4. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
 - 5. AWWA C150 - Thickness Design of Ductile-Iron Pipe.
 - 6. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast for Water or Other Liquids.
 - 7. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
 - 8. AWWA C606 - Grooved and Shouldered Joints.
 - 9. AWWA C651 - Disinfecting Water Mains.
- D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. Each length of ductile iron pipe supplied for the project shall be hydrostatically tested at the point of manufacture to 500 psi for a duration of 10 seconds per AWWA C151. Testing may be performed prior to machining bell and spigot. Failure of ductile iron pipe shall be defined as any rupture of the pipe wall. Certified test results shall be furnished in duplicate to the ENGINEER prior to time of shipment.
- B. All ductile-iron pipe and fittings to be installed under this project shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. Furnish in duplicate to the ENGINEER sworn certificates of such tests and their results prior to the shipment of the pipe.
- C. All pipe and fittings to be installed under this Contract may be inspected at the plant for compliance with this Section by an independent testing laboratory selected by the OWNER, at the OWNER's expense.
- D. Inspection of the pipe and fittings will also be made by the ENGINEER or representative of the OWNER after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the specified requirements, even though sample pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job.
- E. All pipe and fittings shall be permanently marked with the following information:
 - 1. MANUFACTURER, date.
 - 2. Size, type, class, or wall thickness.
 - 3. Standard produced to (AWWA, ASTM, etc).

1.06 DELIVERY, STORAGE AND HANDLING

- A. See Section 01610 for general requirements.
- B. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe or coatings. Under no circumstances shall the pipe be dropped or skidded against each other. Slings, hooks, or pipe tongs shall be padded and used in such a manner as to prevent damage to the exterior surface or internal lining of the pipe.

- C. Materials, if stored, shall be kept safe from damage. The interior of all pipe, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times.
- D. Pipe shall not be stacked higher than the limits recommended by its MANUFACTURER. The bottom tier shall be kept off the ground on timbers, rails, or concrete. Stacking shall conform to MANUFACTURER's recommendations.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Pipe
 - 1. Ductile iron pipe shall conform to AWWA C115 and C110. Flanged pipe shall be Special Thickness Class 53 as per AWWA C150. Pipe shall be supplied in standard lengths as much as possible.
 - 2. Ductile iron pipe shall be as manufactured by U.S. Pipe and Foundry Company, Inc., American Cast Iron Pipe Company, or equal.
- B. Joints
 - 1. Ductile iron pipe shall have flanged joints. Flanges shall be flat face type, unless otherwise noted. Flanges shall be faced and drilled per ANSI B16.1 Class 125. Flanges must be suitable for the specified test pressure per Section 02616.
 - 2. Flange gasket shall be full face type EPDM per AWWA C111 to provide positive sealing for the flanged ductile iron joints. Thickness shall be 1/8-in unless otherwise indicated.
 - 3. Assembly bolts and nuts shall be low-carbon alloy steel conforming to ASTM A307 Grade B with hex heads and conforming to ANSI B18.1 and B18.2. Bolt length shall be such that after joints are assembled, the bolts shall protrude through the nuts, but not more than 1/2-in.
 - 4. Flanged coupling adaptors shall be Smith-Blair Type 913 with Type 907 Restraint Plates and Rods, Dresser Style 128-W with Style 441 Tie Plates and Rods, or equal. Tie rods and nuts shall be 304 SS. Anchor studs will not be permitted.
- C. Fittings
 - 1. Pipe fittings shall be flanged ductile iron. Fittings shall meet the requirements of AWWA C110 as applicable. Fittings shall have a minimum pressure rating of 250 psi.
- D. Interior Lining
 - 1. Ductile iron pipe and fittings shall have a cement mortar lining in accordance with AWWA C104.
- E. Exterior Coatings
 - 1. Unless otherwise specified, all pipe and fittings furnished under this section shall be shop-primed with urethane primer system (3.0 to 5.0 mils DFT) finish painted in the field with an applicable paint system as specified under Division 9. Surface preparation and application thereof shall be in conformance with applicable provisions of Division 9.
- F. Thermal Insulation
 - 1. Insulation shall be provided as indicated on the Drawings.

PART 3 – EXECUTION

3.01 PIPE INSTALLATION

A. General

1. All piping and fittings shall be installed true to alignment and rigidly supported. Anchorage shall be provided where required. Any damage to linings shall be repaired to the satisfaction of the ENGINEER before the pipe is installed. Each length of pipe shall be cleaned out before installation. All of MANUFACTURER's recommendations shall be complied with.
2. The deflection at joints shall not exceed that recommended by the pipe MANUFACTURER. Fittings, in addition to those shown on the Drawings, shall be provided, if required, in areas where conflict exists with the existing facilities.
3. When pipe cutting is acceptable to the ENGINEER, the cutting shall be done by abrasive saw, leaving a smooth cut at right angles to the axis of the pipe. Any damage to the lining shall be repaired to the satisfaction of the ENGINEER. Field cut ends shall be sealed with approved epoxy in accordance with MANUFACTURER's instructions.
4. Ductile iron and fittings shall be installed in accordance with requirements of AWWA C600 modified.

B. Jointing

1. Flanged joints shall be made using gaskets, bolts, bolt studs with a nut on each end, or studs with nuts where the flange is tapped. The number and size of bolts shall conform to the same ANSI Standard as the flanges.
2. Bolts in flanged joints or mechanical joints shall be tightened alternately and evenly.
3. Sleeve type couplings and grooved joints using split ring couplings shall be installed in accordance with the procedures recommended by their respective MANUFACTURERS.

C. All pipe and appurtenances connected to equipment shall be supported in such a manner as to prevent any strain being imposed on the equipment. When MANUFACTURERS have indicated requirements that piping loads shall not be transmitted to their equipment, submit a certification stating that such requirements have been complied with.

D. Sleeves of proper size shall be installed for all pipes passing through floors or walls. Sleeves shall be installed as shown on the Drawings. Where indicated on the Drawings or required for liquid or gas-tightness, the pipe shall be sealed with a mechanical seal similar to Link-Seal as manufactured by Thunderline Corporation, or equal.

E. Sleeves and wall pipes shall have thrust collar located at the mid-depth of wall.

F. Concrete inserts for hangers and supports shall be furnished and installed as recommended by the MANUFACTURER as shown on the Drawings or as specified herein. The inserts shall be set in accordance with the requirements of the piping layout and their locations verified from approved piping layout drawings and the structural drawings.

3.02 TESTING

A. All piping shall be subject to acceptance tests. Provide all necessary utilities, labor and equipment for flushing and testing and dispose all waste after the test including water.

B. All pipe and fittings shall be pressure tested in accordance with Section 02616.

- C. Correct any leakage and repair any damage to the pipe and pipe appurtenances or to any structures resulting from, or caused by tests. All leaks shall be repaired and lines retested.

3.03 CLEANING

- A. Clean all of the pipe by flushing with water or other means to remove all dirt, stones, pieces of wood, or other material which may have entered during the construction period. All debris shall be removed from the pipeline. The lowest segment outlet shall be flushed last to assure debris removal.

3.04 PIPE MARKING

- A. All exposed piping, exterior and interior, shall be identified by painted legend markers, directional arrow markers and number markers as required. Pipe marking colors shall contrast with pipe color for ease of visibility. Pipe marking shall match the existing markings. Letters and markers 1-1/8-in in width shall be installed on pipes under 3-in in diameter. Markers 2-1/2-in in width shall be installed on pipes 3-in in diameter and larger. Legend markers, directional arrow markers and number markers shall be placed as directed by the ENGINEER. Markers shall be located where pipes pass through walls or floors, at piping intersections and maximum 15-ft spacing on piping runs.

END OF SECTION

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SECTION 15100

VALVES AND APPURTENANCES

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install complete and ready for operation and test all non-buried valves as shown on the Drawings and as specified herein.
- B. The equipment specified in this section includes the types of valves listed below and located above ground or exposed in vaults.
 - 1. General Requirements
 - 2. Valve Actuators – Manual
 - 3. Butterfly Valves
 - 4. Gate Valves (2.5 Inches In Diameter And Smaller)
 - 5. Resilient Seated Gate Valves (3 Inches In Diameter And Larger)
 - 6. Tapping Sleeves and Valves
 - 7. Line Stops
 - 8. Valve Boxes
 - 9. Corporation Stops
 - 10. Air Release Valves
 - 11. Ball Valves

1.02 RELATED WORK

- A. Piping and disinfection for potable water systems is included in the respective Sections of Divisions 2 and 15.
- B. Instrumentation, not specified herein, is included in Division 13.
- C. Electrical work is included in Division 16.
- D. Certain items similar to those specified in this Section may be specified to be furnished and installed with individual equipment or systems. In case of a conflict, those individual equipment or system requirements shall govern.
- E. Valve operators shall be mounted at the factory on the valves as specified herein, as part of the work of this Section.

1.03 SUBMITTALS

- A. Submit to the Engineer, in accordance with Section 01300, materials required to establish compliance with this Section.
 - 1. Valve tag number.
 - 2. The manufacturer and supplier.
 - 3. The address at which equipment will be fabricated or assembled.
 - 4. Drawings showing assembly details, materials of construction and dimensions.
 - 5. Descriptive literature, bulletins and/or catalogs of the equipment.
 - 6. The total weight of each item.

7. A complete bill of materials.
8. Additional submittal data, where noted with individual pieces of equipment.

B. Test Reports

1. Provide certified hydrostatic test data, per manufacturer's standard procedure or MSS-SP-61 for all valves.

C. Certificates

1. For each valve specified to be manufactured, tested and/or installed in accordance with AWWA and other standards, submit an affidavit of compliance with the appropriate standards, including certified results of required tests and certification of proper installation.

D. Manufacturer's Installation and Application Data

E. Operating and Maintenance Data

1. Operating and maintenance instructions shall be furnished to the ENGINEER as provided in Section 01730. The instructions shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions and other information required to instruct operating and maintenance personnel unfamiliar with such equipment.

1.04 REFERENCE STANDARDS

A. ASTM International

1. ASTM A48 - Standard Specification for Gray Iron Castings.
2. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
3. ASTM A240 - Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels.
4. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.
5. ASTM A436 - Standard Specification for Austenitic Gray Iron Castings.
6. ASTM A536 - Standard Specification for Ductile Iron Castings.
7. ASTM B30 - Standard Specification for Copper-Base Alloys in Ingot Form.
8. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings

B. American Water Works Association (AWWA)

1. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C504 - Rubber-Seated Butterfly Valves
3. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service
4. AWWA C550 - Protective Epoxy Interior Coatings for Valves and Hydrants
5. AWWA C800 - Underground Service Line Valves and Fittings

C. American National Standards Institute (ANSI)

1. ANSI B1.20.1 - Specifications, Dimensions, Gauging for Taper and Straight Pipe Threads (except dry seals).
2. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings
3. ANSI B16.10 - Face-to-Face and End-to-End Dimensions of Valves
4. ANSI B16.104 - Butterfly Valves

D. American Iron and Steel Institute (AISI)

E. National Electrical Manufacturers Association (NEMA)

F. Underwriters Laboratories (UL)

G. Factory Mutual (FM)

H. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. Qualifications

1. Valves and appurtenances shall be products of well established firms who are fully experienced, minimum 10 years, reputable and qualified in the manufacture of the particular equipment to be furnished.
2. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with this Section as applicable.
3. All units of the same type shall be the product of one manufacturer.
4. All 480 volt motor actuators shall be the product of one manufacturer. CONTRACTOR shall coordinate this requirement with vendors who supply actuated valves as part of systems specified in Division 11 and 15.

B. Certifications

1. The manufacturers shall furnish an affidavit of compliance with Standards referred to herein as specified in Paragraph 1.03C above. Refer to PART 3 for testing required for certain items in addition to that required by referenced standards.

C. Provide the services of a qualified and factory-trained service representative of the manufacturer to provide operational and maintenance instruction, for a 1 day, 8 hour period for each type of the following equipment:

1. Air release valves.

D. Inspection of the units may also be made by the ENGINEER or other representative of the Owner after delivery. The equipment shall be subject to rejection at any time due to failure to meet any of the specified requirements, even though submittal data may have been accepted previously. Equipment rejected after delivery shall be marked for identification and shall be removed from the job site at once.

1.06 SYSTEM DESCRIPTION

- A. All of the equipment and materials specified herein are intended to be standard for use in controlling the flow of water, wastewater, sludge, air, and chemicals as noted on the Drawings.
- B. Valves, appurtenances and miscellaneous items shall be installed as shown on the Drawings and as specified, so as to form complete workable systems.

1.07 DELIVERY, STORAGE AND HANDLING

A. Reference is made to Division 01 for additional information.

B. Packing and Shipping

1. Care shall be taken in loading, transporting and unloading to prevent injury to the valves, appurtenances, or coatings. Equipment shall not be dropped. All valves and appurtenances shall be examined before installation and no piece shall be installed which is found to be defective. Any damage to the coatings shall be repaired as acceptable to the Engineer.
2. Prior to shipping, the ends of all valves shall be acceptably covered to prevent entry of foreign material. Covers shall remain in place until after installation and connecting piping is completed.
 - a. All valves 3-in and larger shall be shipped and stored on site until time of use with wood or plywood covers on each valve end.
 - b. Valves smaller than 3-in shall be shipped and stored as above except that heavy cardboard covers may be used on the openings.
 - c. Rising stems and exposed stem valves shall be coated with a protective oil film which shall be maintained until the valve is installed and put into use.
 - d. Any corrosion in evidence at the time of acceptance by the Owner shall be removed, or the valve shall be removed and replaced.

C. Storage and Protection

1. Special care shall be taken to prevent plastic and similar brittle items from being directly exposed to the sun, or exposed to extremes in temperature, to prevent deformation. See the individual piping sections and manufacturer's information for further requirements.

1.08 MAINTENANCE

- A. Special tools and the manufacturer's standard spare parts, if required for normal operation and maintenance, shall be supplied with the equipment in accordance with Section 01730 and where noted, as specified herein. Tools shall be packaged in a steel case, clearly and indelibly marked on the exterior to indicate equipment for which tools are intended.
- B. Provide one Operations and Maintenance manual for each type of valve and operator supplied under this specification in accordance with Section 01730.
- C. Included within the Operations and Maintenance manuals, provide a list of all spare and replacement parts with individual prices and location where they are available.

PART 2 – PRODUCTS

2.01 MATERIALS AND EQUIPMENT – GENERAL

- A. Reference is made to Division 1 for additional requirements, including nameplates, provisions for temporary pressure gauges, protection against electrolysis and anchor bolts.
- B. The use of a manufacturer's name and/or model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- C. Valves and appurtenances shall be of the size shown on the Drawings or as noted and as far as possible equipment of the same type shall be identical and from one manufacturer.
- D. Valves and appurtenances shall have the name of the maker, nominal size, flow directional arrows, working pressure for which they are designed and standard referenced, cast in raised letters or via riveted stainless steel nameplate upon some appropriate part of the body.

- E. Unless otherwise noted, items shall have a minimum working pressure the same working pressure as the pipe they connect to, and suitable for the pressures noted where they are installed.
- F. Joints, size and material - unless otherwise noted or required by the Engineer:
 - 1. Except where noted, all joints referred to herein shall be of the same type, nominal diameter, material and with a minimum rating equal to the pipe or fittings they are connected to.
 - 2. Valves and appurtenances shall be of the same nominal diameter as the pipe or fittings they are connected to.
 - 3. All valves exposed to view, or in vaults:
 - a. 3-in and smaller - threaded ends- unless noted otherwise herein or on the Drawings.
 - b. 4-in and larger - flanged ends.
- G. Provide all special adaptors as required to ensure compatibility between valves, appurtenances and adjacent pipe.
- H. No alternative materials will be considered for approval unless complete documentation is provided regarding their satisfactory long-term use in similar conditions; in addition, the consideration of any substitution will be considered only if the superiority of the proposed materials is the intent of the substitution, and only if sufficient evidence is provided to document that superiority.

2.02 VALVE ACTUATORS – MANUAL

- A. All valve actuators shall conform to AWWA C504 and shall be furnished by the valve supplier.
- B. Actuators shall be capable of seating and unseating the disc against the full design pressure and velocity, as specified for each class, into a dry system downstream, and shall transmit a minimum torque to the valve. Actuators shall be rigidly attached to the valve body.
- C. Unless otherwise shown, all valves 8-inch diameter and larger shall be equipped with gear actuators. Actuators shall be fully enclosed.
- D. Gearing shall be machine-cut steel designed for smooth operation. Bearings shall be permanently lubricated with bronze bearing bushings provided to take all thrusts and seals to contain lubricants. Housings shall be sealed to exclude moisture and dirt, allow the reduction mechanisms to operate in lubricant, and be of the same material as the valve body.
- E. Actuators shall be self-locking type and shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering.
- F. Manual actuators for above-grade valves shall be equipped with handwheel, position indicator, and mechanical stop-limiting locking devices to prevent over travel of the disc in the open and closed positions. Handwheels shall turn counterclockwise to open valves. Actuators shall be designed to produce the required torque with a maximum pull of 40 ft-lbs on the handwheel or chainwheel.
- A. Buried butterfly valves 8-inch in diameter and larger shall be furnished with buried gear service actuators, extension stem, square operating nut, and valve box. Buried gear service actuators shall be assembled to the valve by the valve manufacturer and shall comply with AWWA C-504.
- H. Actuator components shall withstand an input of 450 foot pounds for 30" and smaller and 300 foot pounds for larger than 30" at extreme actuator positions without damage.

2.03 BUTTERFLY VALVES

- A. Valves shall be manufactured in strict accordance with AWWA C504. Valves shall be bubble tight at rated pressures. Valve discs shall rotate 90 degrees from full closed to open. Buried gear actuators shall be assembled to the valve by the valve manufacturer. The valve/operator shall be tested as a complete assembly by the valve manufacturer. The manufacturer shall have produced AWWA butterfly valves for a minimum of 5 years.
- B. Valve bodies shall be constructed of cast iron ASTM A126, Class B and have an interior epoxy coating (min. 6 mils DFT). Exterior coatings shall be as specified in Paragraph 2.11.
- C. Buried valves shall be mechanical joint end conforming to ANSI C111, unless otherwise indicated on the Drawings. Valves located above ground shall have Class 150 flange joints. Flange drilling shall conform to ANSI B16.1, Class 125.
- D. Valve discs for 12-inch and smaller valves shall be Type 316 stainless steel. For valves larger than 12-inch, discs shall be constructed of cast iron conforming to ASTM A-48 Class 40, or ductile iron conforming to ASTM A-536 Grade 65-45-12, and shall have epoxy coating (min. 6 mils DFT)..
- E. Rubber valve seats shall be EPDM and mounted to the valve body. For 20-inch and smaller flanged valves, the EPDM seat shall fully line the interior of the valve.
- F. Valve shafts shall be Type 304 stainless steel, ASTM A276 and shall be of a diameter not less than those listed in AWWA C504, Class 150B.
- G. Shaft seals shall be furnished where the shaft projects thru the valve body. Shaft seals shall be standard split-v type packing or of an O-ring design.
- H. Valves shall be fitted with sleeve type bearings contained in the trunions of the valve body. Bearing material shall be nylon for valves thru 20-in and fiberglass with teflon lining for valves 24-in and larger.
- I. Valve manufacturer shall furnish and mount operator suitable for buried service. Operators shall be self-locking and suitable for submergence to 20-ft. A 2-in square operating nut shall be furnished. Operator stops shall be capable of withstanding an input of 450 ft-lbs.
- J. All valves shall be hydrostatically and leak tested.
- K. Valve class shall be AWWA Class 150B with operators sized for bi-directional flow.
- L. Butterfly valves shall be manufactured by Pratt or DeZurik.

2.04 GATE VALVES (2.5 INCHES IN DIAMETER AND SMALLER)

- A. Valves Gate valves 2.5-in diameter and smaller shall have screwed ends and shall be bronze body. Gate valves 3-in diameter shall be flanged end, iron or bronze body. Gate shall be brass, bronze, or Type 304 stainless steel solid wedge; union bonnet; silicon bronze rising-stem; equal to Jenkins Figure 47CUJ, division of Crane Valve Group; Lunkenheimer Figure 3127, Cincinnati Valve Co, Fairbanks Figure U-0252, or equal. Model numbers referenced above are for screwed ends, flanged shall be equal construction with appropriate end connections.

2.05 RESILIENT SEATED GATE VALVES (3 INCHES IN DIAMETER AND LARGER)

- A. Valves 3-in through 36-in shall be non-rising stem type and manufactured in accordance with AWWA C509 and as specified herein. Valves shall be manufactured by American, M&H, Kennedy, or McWane. No others shall be accepted.
- B. Valve body shall be ASTM A536 ductile iron with fusion bonded epoxy coating.
- C. Valves shall be provided with a minimum of two O-ring stem seals.
- D. Bonnet and gland bolts and nuts shall be either ASTM A 126, Class B. All ferrous surface inside and out shall have a fusion-bonded epoxy coating. The hot-dip process in accordance with ASTM A153 is not acceptable. Allen-wrench type bonnet and gland fastening shall not be acceptable and will be rejected.
- E. Wedges shall be constructed of ASTM A536 ductile iron and totally encapsulated in vulcanized EPDM.
- F. The word "OPEN" and an arrow indicating direction to open shall be cast on each valve body or operator.
- G. Operating nut for all gate valves shall be 2-in square.
- H. Extension stems shall be fabricated from solid steel. Stems shall not be smaller in diameter than the valve stem. Equip stem with wrench nut. Ensure all stem connections are pinned.
- I. Thrust collars and stems shall be integrally cast (not pinned on) and shall feature copper alloy valve stems.
- J. Buried valves shall have mechanical joint ends compliant with AWWA C111 unless otherwise noted on the Drawings.
- K. Gearing shall be required for gate valves 14-in diameter and larger, and shall be in accordance with AWWA C509 Part 4.4.9.

2.06 TAPPING SLEEVES AND TAPPING VALVES

- A. Tapping sleeves shall be of ductile iron, designated for working pressure not less than 200 psi. Armored end gaskets shall be provided for the full area of the sleeve flanges. Sleeves shall be as manufactured by Kennedy, M&H, or Clow. Nuts and bolts shall be ASTM A 126, Class B. All ferrous surface inside and out shall have a fusion-bonded epoxy coating.
- B. Tapping valves shall conform to the requirements specified above for gate valves except that one end shall be flanged and one mechanical. Tapping valves shall be provided with an oversized opening to permit the use of full size cutters.

2.07 LINE STOPS

- A. Temporary line stops shall be provided, installed, and removed where required to isolate sections of existing mains to allow installation of new fittings and valves.

- B. Line stop sleeves shall be mechanical joint split cast-iron units rated for 150 psi working pressure.
- C. Line stops shall have ANSI B 165-1, 125 lb. outlet flanges. The CONTRACTOR shall determine the outside diameter of the existing main before ordering the sleeve.
- D. Completion plugs used for line-stopping shall be manufactured from ASTM-36 grade material as a minimum. Completion plugs shall be designed with a groove for the placement of an O-Ring that will aid in the permanent sealing of the line-stop fitting to permit the recovery of our temporary valve used in the line-stop procedure.
- E. Line-stopping completion plug on mains 16" and above will be designed with a reduced branch outlet.
- F. Minimum blind flange thickness of the cover plate shall comply with AWWA C-207.
- G. The temporary line-stopping valve shall be supplied for the duration of the line-stopping procedure.
- H. A service saddle to purge the pressure from the main once the line-stopping heads are in place shall be used. The service saddle will be utilized to re-pressurize the main allowing equal pressure on both sides of the line-stopping head in order to extract the head from the main. The CONTRACTOR shall check for any leaks in the modifications prior to the heads being extracted.
- I. Line Stops shall be Rangeline, TD Williams, or approved equal.

2.08 VALVE BOXES

- A. All gate, butterfly and plug valves shall be provided with extension shafts, operating nuts and valve boxes as follows:
 - 1. Extension shafts shall be carbon steel and the operating nut shall be 2-in square. Shafts shall be designed to provide a factor of safety of not less than four. Operating nuts shall be pinned to the shafts.
 - 2. Top of the operating nut shall be located 2-in below the rim of the valve box.
 - 3. Valve boxes shall be as manufactured by Clow, Mueller, Tyler or equal and shall be a heavy-pattern cast iron, three-piece, telescoping type box with dome base suitable for installation on the buried valves. Inside diameter shall be at least 4-1/2-in. Barrel length shall be adapted to the depth of cover, with a lap of at least 6-in when in the most extended position. Covers shall be cast iron with integrally-cast direction-to-open arrow, and the word "WATER" shall also be integrally cast. Aluminum or plastic are not acceptable. A means of lateral support for the valve extension shafts shall be provided in the top portion of the valve box.
 - 4. The upper section of each box shall have a top flange of sufficient bearing area to prevent settling. The bottom of the lower section shall enclose the stuffing box and operating nut of the valve and shall be oval.
 - 5. All fasteners shall be Type 304 stainless steel.

2.09 CORPORATION STOPS

- A. 3/4" through 2" corporation stops shall be ball valve type, meeting AWWA Standard C800-01, Sec. 4.2.3 (High Pressure), withstanding working pressures up to 300 psi. The body, ball, operating stem, T-head, and service line connector shall be manufactured from red brass and conform to ASTM B62 and/or ASTM B584, UNS No. C83600. The ball shall be fluorocarbon

coated and shall float on two EPDM seats and be watertight in both directions. The operating stem and nut shall be one piece, held in place by a mating machined flange on the stem and in the body. The operating stem shall have an EPDM O-ring to provide a watertight seal against the body.

- B. Inlet threads shall be AWWA Taper, except where used with service clamps, where threads shall be IPS threads. All thread types and diameters shall conform to AWWA C800. The inlet threads will be integral to the body. The waterway diameter shall be approximately equivalent to the nominal size of the stop, and shall accommodate the maximum cutter size established by AWWA C800. The outlet shall be a compression connection meeting AWWA C800 Sec. 4.4.9.
- C. Corporation Stops shall be FB Style Ballcorp, as manufactured by The Ford Meter Box Company, Inc., Wabash, Indiana, or equal. Where corporation stops are used with plastic pipe, a brass companion flange shall be provided on the outlet of each corporation stop.

2.10 AIR RELEASE VALVES

- A. Air release valves shall be installed to release any small accumulations of air which may collect while pipe is in operation and under pressure.
- B. The small orifice assembly air release valve shall automatically release air accumulations from the pipe while under positive pressure. When the valve body fills with air, the float ball shall fall to open the small orifice and exhaust the air to atmosphere. When the air has been exhausted, the float ball shall be buoyed up and tightly close the small orifice.
- C. The small orifice assembly shall be furnished with cast iron body and cover (ASTM A126-B) or ductile iron suitable for field test pressure as specified in Section 01445. The float ball shall be constructed of stainless steel and attached to a stainless steel lever mechanism. A resilient, Buna-N seat shall be attached to the lever mechanism for drop-tight closure.
- D. Valves shall be provided with a vacuum check to prevent air from re-entering the line. Fittings shall be threaded unless otherwise shown on the Drawings.
- E. Air release valve vents shall be covered with stainless steel screen.
- F. Separate air release valves shall be manufactured by APCO Model 200A, or equal.

2.11 BALL VALVES

- A. Valves shall be bronze, resilient seated, full port, threaded two piece bolted body type valves. Manual valves shall have locking levers. The body and cap shall be of brass, ASTM B30, the ball and stem of Type 316 stainless steel and the seats and seals of glass filled TFE. The balls shall be full floating, non-lubricated. Valve seats shall be easily accessible and replaceable.
- B. Valves shall be Jamesbury Series 2000 Style 21 as manufactured by Metso Automation; or equal.

2.12 SURFACE PREPARATION AND SHOP COATINGS

- A. Notwithstanding any of these specified requirements, all coatings and lubricants in contact with potable water shall be certified per NSF Standard 61 for contact with potable water.
- B. If not specified herein, coatings shall comply with the requirements of Section 09901 and 09902. In case of a conflict, the requirements of this Section govern.
- C. If the manufacturer's requirement is not to require finished coating on any interior surfaces, then manufacturer shall so state and no interior finish coating will be required, if acceptable to the Engineer.
- D. The exterior ferrous metal surfaces of above-grade valves, operators, and floor-stands shall be thoroughly cleaned of all scale, dirt, grease or other foreign matter and thereafter one shop coat of an approved rust-inhibitive primer such as Inertol Primer No. 621 shall be applied in accordance with the instructions of the paint manufacturer or other primer compatible with the finish coat to be provided in the field.
- E. Exterior surfaces of buried valves shall be blast cleaned in accordance with SSPC SP-6 and given two shop coats of an approved two-component coal tar epoxy paint.
- F. Unless otherwise noted, interior ferrous surfaces of all valves shall be given a shop finish of epoxy conforming to AWWA C550 with a minimum thickness of 6 mil.
- G. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable rust-resistant coating. Mounting surfaces shall be especially coated with a rust preventative.
- H. Special care shall be taken to protect uncoated items and plastic items, especially from environmental damage.

2.13 FACTORY INSPECTION AND TESTING

- A. Factory inspection, testing and correction of deficiencies shall be done in accordance with the referenced standards and as noted herein.
- B. See Division 1 for additional requirements. Also refer to PART 1, especially for required submission of test data to the Engineer.
- C. In addition to all tests required by the referenced standards, the following shall also be factory tested:
 - 1. Pressure regulating valves shall be factory tested at the specified pressures and flows.
 - 2. Butterfly valves shall be factory tested to demonstrate drop tight closure at the specified conditions.
 - 3. All types of air and vacuum valves.

PART 3 – EXECUTION

3.01 INSTALLATION – GENERAL

- A. All valves and appurtenances shall be installed per the manufacturer's instructions in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the ENGINEER before they are installed.

- B. Install all brackets, extension rods, guides, the various types of operators and appurtenances as shown on the Drawings, or otherwise required. Before setting these items, check all Drawings and figures which have a direct bearing on their location. The CONTRACTOR shall be responsible for the proper location of valves and appurtenances during the construction of the work.
- C. All materials shall be carefully inspected for defects in construction and materials. All debris and foreign material shall be cleaned out of openings, etc. All valve flange covers shall remain in place until connected piping is in place. All operating mechanisms shall be operated to check their proper functioning and all nuts and bolts checked for tightness. Valves and other equipment which do not operate easily, or are otherwise defective, shall be repaired or replaced at no additional cost to the Owner.
- D. Where installation is covered by a referenced standard, installation shall be in accordance with that standard, except as herein modified, and the CONTRACTOR shall certify such. Also note additional requirements in other parts of this Section.
- E. Unless otherwise noted, joints for valves and appurtenances shall be made up utilizing the same procedures as specified under the applicable type connecting pipe joint and all valves and other items shall be installed in the proper position as recommended by the manufacturer. CONTRACTOR shall be responsible for verifying manufacturers' torquing requirements for all valves.

3.02 INSTALLATION OF MANUAL OPERATIONAL DEVICES

- A. Unless otherwise noted, all operational devices shall be installed with the units of the factory, as shown on the Drawings or as acceptable to the ENGINEER to allow accessibility to operate and maintain the item and to prevent interference with other piping, valves and appurtenances.
- B. For manually operated valves 3-in in diameter and smaller, valve operators and indicators shall be rotated to display toward normal operation locations.
- C. Floor boxes, valve boxes, extension stems and low floor stands shall be installed vertically centered over the operating nut, with couplings as required and the elevation of the box top shall be adjusted to conform to the elevation of the finished floor surface or grade at the completion of the Contract. Boxes and stem guides shall be adequately supported during concrete placement to maintain vertical alignment.

3.03 INSPECTION, TESTING AND CORRECTION OF DEFICIENCIES

- A. See also Division 1. Take care not to over pressure valves or appurtenances during pipe testing. If any unit proves to be defective, it shall be replaced or repaired to the satisfaction of the Engineer.
- B. Functional Test: Prior to plant startup, all items shall be inspected for proper alignment, quiet operation, proper connection and satisfactory performance. After installation, all manual valves shall be opened and closed in the presence of the ENGINEER to show the valve operates smoothly from full open to full close and without leakage. Valves equipped with electric, pneumatic or hydraulic actuators shall be cycled 5 times from full open to full closed in the presence of the ENGINEER without vibration, jamming, leakage, or overheating. Pressure control and pressure relief valves shall be operated in the presence of the ENGINEER to show they perform their specified function at some time prior to placing the piping system in operation and as agreed during construction coordination meetings.

- C. The various pipe lines in which the valves and appurtenances are to be installed are specified to be field tested. During these tests any defective valve or appurtenance shall be adjusted, removed and replaced, or otherwise made acceptable to the Engineer.
- D. Various regulating valves, strainers, or other appurtenances shall be tested to demonstrate their conformance with the specified operational capabilities and any deficiencies shall be corrected or the device replaced or otherwise made acceptable to the Engineer.

3.04 CLEANING

- A. All items including valve interiors shall be inspected before line closure, for the presence of debris. At the option of the Engineer, internal inspection of valve and appurtenances may be required any time that the likelihood of debris is a possibility. All pipes and valves shall be cleaned prior to installation, testing disinfection and final acceptance.

3.05 DISINFECTION

- A. Disinfection of valves and appurtenances on all potable water lines and where otherwise noted, shall be as noted in Paragraph 1.02B above.

END OF SECTION

SECTION 16050
ELECTRICAL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials and equipment required to install complete and make operational, electrical and process instrumentation systems as specified, as shown on the Drawings.
- B. The work shall include furnishing and installing the following:
 - 1. Conduit, wire and field connections for all motors, motor controllers, control devices, terminal boxes, power panels and electrical equipment furnished herein and under other Divisions of these Specifications.
 - 2. Conduit, wiring, terminations, mounting equipment, hardware, and labor for installation of all field mounted instruments specified herein and under other Divisions of these Specifications. This includes process instrumentation primary elements, transmitters, local indicators, and lightning and surge protection equipment wiring at process instrumentation transmitters. Install vendor furnished cables specified under other Divisions of these Specifications.
 - 3. Grounding System
 - 4. Underground System
- C. The Contractor shall maintain the existing process in operation at all times. Temporary power, control, and instrumentation connections as required shall be provided by the Contractor at no additional expense to the Owner. All temporary wiring shall be in accordance with the NEC. Any 480V temporary equipment feeders shall be installed in conduit. The Contractor shall provide to the Engineer details, methods, materials etc. prior to making temporary connections. Furnish and install all equipment and materials including control equipment, motor starters, branch and feeder circuit breakers, panelboards, transformers, etc., for temporary power.
- D. Each bidder or their authorized representatives shall, before preparing their proposal, visit all areas of the existing structures in which work under this bid is to be performed and inspect carefully the present installation. The submission of the proposal by this bidder shall be considered evidence that they have visited the site, structures and noted the locations and conditions under which the work will be performed and that they takes full responsibility for a complete knowledge of all factors governing his/her work.
- E. All power interruptions to electrical equipment shall be at the Owner's convenience with 72 hours (minimum) notice. Each interruption shall have prior approval.
- F. The work shall include complete testing of all equipment and wiring at the completion of work and making any minor correction changes or adjustments necessary for the proper

functioning of the system and equipment. All workmanship shall be of the highest quality; substandard work will be rejected.

- G. The Contractor shall coordinate with the Power Company as needed to service and energize the new service. The Contractor shall pay all fees and charges as required, including those to obtain temporary and permanent service.

1.02 RELATED WORK

- A. Excavation and backfilling, including gravel or sand bedding for underground electrical work is included in Division 2.
- B. Cast in place concrete work is included in Division 3.
- C. Refer to Process Mechanical Drawings for the exact location of mechanical, instrumentation and process equipment.

1.03 SUBMITTALS

- A. Submit, in accordance with Section 01300, shop drawings for equipment, materials and other items furnished under Division 16.
 - B. Check shop drawings for accuracy and contract requirements prior to submittal. Shop drawings shall be stamped with the date checked and a statement indicating that the shop drawings conform to Specifications and Drawings. This statement shall also list all exceptions to the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.
 - C. The Engineer's check shall be for conformance with the design concept of the project and compliance with the Specifications and Drawings. Errors and omissions on approved shop drawings shall not relieve the Contractor from the responsibility of providing materials and workmanship required by the Specifications and Drawings.
 - D. All dimensions shall be field verified at the job site and coordinated with the work of all other trades.
 - E. Material shall not be ordered or shipped until the shop drawings have been approved. No material shall be ordered or shop work started if shop drawings are marked "APPROVED AS NOTED - CONFIRM," "APPROVED AS NOTED - RESUBMIT" or "NOT APPROVED."
 - F. Operation and Maintenance Data
- 1. Submit operations and maintenance data for equipment furnished under this Division, in accordance with Section 01730. The manuals shall be prepared specifically for this installation and shall include catalog data sheets, drawings, equipment lists, descriptions, parts lists, etc, to instruct operating and maintenance personnel unfamiliar with such equipment.

1.04 CONTRACT PERFORMANCE REQUIREMENTS

- A. Electric equipment, materials and installation shall comply with the latest edition of the National Electrical Code (NEC) and with the latest edition of the following codes and standards:
 - 1. National Electrical Safety Code (NESC)
 - 2. Occupational Safety and Health Administration (OSHA)
 - 3. National Fire Protection Association (NFPA)
 - 4. National Electrical Manufacturers Association (NEMA)
 - 5. American National Standards Institute (ANSI)
 - 6. Insulated Cable Engineers Association (ICEA)
 - 7. Instrument Society of America (ISA)
 - 8. Underwriters Laboratories (UL)
 - 9. Factory Mutual (FM)
 - 10. National Electrical Testing Association (NETA)
- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 PRIORITY OF THE CONTRACT DOCUMENTS

- A. If, during the performance of the work, the Contractor finds a conflict, error or discrepancy between or among one or more of the Sections or between or among one or more Sections and the Drawings, furnish the higher performance requirements. The higher performance requirement shall be considered the equipment, material, device or installation method which represents the most stringent option, the highest quality or the largest quantity.
- B. In all cases, figured dimensions shall govern over scaled dimensions, but work not dimensioned shall be as directed by the Engineer and work not particularly shown, identified, sized, or located shall be the same as similar work that is shown or specified.
- C. Detailed Drawings shall govern over general drawings, larger scale Drawings take precedence over smaller scale Drawings, Change Order Drawings shall govern over Contract Drawings and Contract Drawings shall govern over Shop Drawings.
- D. If the issue of priority is due to a conflict or discrepancy between the provisions of the Contract Documents and any referenced standard, or code of any technical society, organization or association, the provisions of the Contract Documents will take precedence if they are more stringent or presumptively cause a higher level of performance. If there is any conflict or discrepancy between standard specifications, or

codes of any technical society, organization or association, or between Laws and Regulations, the higher performance requirement shall be binding on the Contractor, unless otherwise directed by the Engineer.

- E. In accordance with the intent of the Contract Documents, the Contractor accepts the fact that compliance with the priority order specified shall not justify an increase in Contract Price or an extension in Contract Time nor limit in any way, the Contractor's responsibility to comply with all Laws and Regulations at all times.

1.06 SERVICE AND METERING

- A. The power company serving this project is Florida Power & Light (FPL). Service will be obtained at 120/240 Volts, 1 Phase, 3 Wire, 60 Hz, to the service entrance equipment as shown on the drawings. Contractor shall pay all fees and charges as required to obtain temporary and permanent service. Coordinate with FPL to provide and meet requirements for these services. Upon activation of permanent service, the Owner shall pay monthly power company charges for permanent service. Monthly power company charges for temporary power service shall be paid by the Contractor. Contractor will coordinate with Power Company for both temporary and permanent service. Power Company contact is David Alvarez, telephone (941)927-4260, email: David.Alvarez@fpl.com.

- B. The power company will be responsible for the following work:

- 1. Furnishing meter.
- 2. Furnishing and installing power pole, secondary riser and point of service handhole
- 3. Terminating conductors within the point of service handhole.

- C. The Contractor shall be responsible for the following work:

- 1. Obtain an estimate from the power company for the work and include the cost of the power company work in the Bid Price.
- 2. Make all arrangements with the power company for obtaining electrical service.
- 3. Furnishing and installing a power company approved meter base and enclosure.
- 4. Installing FPL provided meter.
- 5. Furnishing and installing conduits and cables from FPL point of service handhole to the service entrance equipment.
- 6. Submit shop drawings for the following items to the Engineer and Power Company for approval:
- 7. Meter base and enclosure.
- 8. Metering instrument and installation.

1.07 ENCLOSURE TYPES

- A. Unless otherwise specified, electrical enclosures shall be rated NEMA 4X.

1.08 HAZARDOUS AREAS

- A. Equipment, materials and installation in areas designated as hazardous shall comply with National Electrical Code Articles 500, 501, 502 and 503.
- B. Equipment and materials installed in hazardous areas shall be UL listed for the appropriate hazardous area classification.

1.09 CODES, INSPECTION AND FEES

- A. Equipment, materials and installation shall comply with the requirements of the local authority having jurisdiction.
- B. Obtain all necessary permits and pay all fees required for permits and inspections.

1.10 TESTS AND SETTINGS

- A. Test systems and equipment furnished under Division 16 and repair or replace all defective work and equipment. Refer to the individual equipment sections for additional specific testing requirements.
- B. Make adjustments to the systems and instruct the Owner's personnel in the proper operation of the systems.
- C. In addition to the specific testing requirements listed in the individual sections, the following minimum tests and settings shall be performed.
 - 1. Mechanical inspection, testing and settings of circuit breakers, disconnect switches, protection relays, overload relays, control circuits and equipment for proper operation.
 - 2. Check the full load current draw of each motor.
 - 3. Check power and control power fuse ratings. Replace fuses if they are found to be of the incorrect size.
 - 4. Check motor nameplates for correct phase and voltage. Check bearings for proper lubrication.
 - 5. Check rotation of motors prior to testing the driven load. Disconnect the driven equipment if damage could occur due to wrong rotation. If the rotation is for the driven equipment is not correct, disconnect the motor lead connections at the motor terminal box and reconnect for proper rotation.
 - 6. Check interlocking, control and instrument wiring for each system and/or part of a system to prove that the system will function properly as indicated by control schematic and wiring diagrams.

7. Inspect each piece of equipment in areas designated as HAZARDOUS to insure that equipment of proper rating is installed.
 8. Verify all terminations at transformers, equipment, panels and enclosures by producing a 1, 2, 3 rotation on a phase sequenced motor when connected to "A," "B" and "C" phases.
 9. Test the grounding system using the three point fall in potential method.
 10. Test all 600 Volt wire insulation with a meg-ohm meter after installation. Make tests at not less than 500V. Submit a written test report of the results to the Engineer.
- D. Testing shall be scheduled and coordinated with the Engineer at least two weeks in advance. Provide qualified test personnel, instruments and test equipment.

1.11 SIZE OF EQUIPMENT

- A. Investigate each space in the structure through which equipment must pass to reach its final location. Coordinate shipping splits with the manufacturer to permit safe handling and passage through restricted areas in the structure.
- B. The equipment shall be kept upright at all times during storage and handling. When equipment must be tilted for passage through restricted areas, brace the equipment to insure that the tilting does not impair the functional integrity of the equipment.

1.12 RECORD DRAWINGS

- A. As the work progresses, legibly record all field changes on a set of project contract drawings, hereinafter called the "record drawings."
- B. Record drawings shall accurately show the installed condition of the following items:
 1. One-line Diagram(s).
 2. Raceways and pullboxes.
 3. Conductor sizes and conduit fills.
 4. Panel Schedule(s).
 5. Control Wiring Diagram(s).
 6. Underground raceway and duct bank routing.
 7. Plan view, sizes and location power panels.
- C. Submit a schedule of control wiring raceways and wire numbers, including the following information:
 1. Circuit origin, destination and wire numbers.
 2. Field wiring terminal strip names and numbers.

- D. As an alternate, point-to-point connection diagrams showing the same information may be submitted in place of the schedule of control wiring raceways and wire numbers.
- E. Submit the record drawings and the schedule of control wiring raceways and wire numbers (or the point-to-point connection diagram) to the Engineer.

1.13 EQUIPMENT INTERCONNECTIONS

- A. Review shop drawings of equipment furnished under other Divisions of this Specification and prepare coordinated wiring interconnection diagrams or wiring tables. Submit copies of wiring diagrams or tables with Record Drawings.
- B. Furnish and install all equipment interconnections.

1.14 MATERIALS AND EQUIPMENT

- A. Materials and equipment shall be new.
- B. Material and equipment of the same type shall be the product of one manufacturer and shall be UL listed.
- C. Provide Quality Control in accordance with Section 01400.
- D. Warrant all equipment furnished under Division 16 in accordance with Section 01740. Refer to individual equipment sections for additional warranty items.

1.15 EQUIPMENT IDENTIFICATION

- A. Identify equipment (disconnect switches, control stations, etc) furnished under Division 16 with the name of the equipment it serves. Control and power panels, junction or terminal boxes, transfer switches, etc, shall have nameplate designations as shown on the Drawings.
- B. Nameplates shall be engraved, laminated plastic, not less than 1/16-in thick by 3/4-in by 2-1/2-in with 3/16-in high white letters on a black background.
- C. Nameplates shall be bonded to all enclosure types using an epoxy or similar permanent waterproof adhesive. Two sided foam adhesive tape is not acceptable. Where the equipment size does not have space for mounting a nameplate the nameplate shall be permanently fastened to the adjacent mounting surface.

1.16 INTERPRETATION OF DRAWINGS

- A. Unless specifically stated to the contrary, the Drawings are not intended to show exact locations of conduit runs. Coordinate the conduit installation with other trades and the actual supplied equipment.
- B. Install each 3 phase circuit in a separate conduit unless otherwise shown on the Drawings.
- C. Unless otherwise approved by the Engineer, conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.

- D. Where circuits are shown as "home-runs" all necessary fittings and boxes shall be provided for a complete raceway installation. Where home-runs indicate conduit is to be installed concealed or exposed the entire branch circuit shall be installed in the same manner. Unless otherwise indicated install branch circuit conduits exposed in process/industrial type spaces and concealed in finished spaces.
- E. Verify the exact locations and mounting heights of lighting fixtures, switches and receptacles prior to installation.
- F. Except where dimensions are shown, the locations of equipment, fixtures, outlets and similar devices shown on the Drawings are approximate only. Exact locations shall be determined by the Contractor and approved by the Engineer during construction. Obtain information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.
- G. Circuit layouts are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting and other electrical systems shown.
- H. Redesign of electrical or mechanical work, which is required due to the Contractor's use of an alternate item, arrangement of equipment and/or layout other than specified herein, shall be done by the Contractor at his/her own expense. Redesign and detailed plans shall be submitted to the Engineer for approval. No additional compensation will be provided for changes in the work, either his/her own or others, caused by such redesign.
- I. It is the intent of these Specifications that the Electrical Systems shall be suitable in every way for the service required. All materials and all work that may be implied as being incidental to the work of this Section shall be furnished at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 CONDUITS AND FITTING

- A. Rigid Aluminum Conduit
 - 1. Rigid aluminum conduit shall be 6063 alloy and shall be as manufactured by American Conduit by SAPA, Wheatland Tube, AFC Co., or equal.
- B. Rigid Nonmetallic Conduit
 - 1. PVC conduit shall be rigid polyvinyl chloride schedule 80 as manufactured by Carlon; An Indian Head Co.; Kraloy Products Co., Inc.; Highland Plastics Inc. or equal.
- C. Liquidtight Flexible Metal Conduit, Couplings and Fittings
 - 1. Liquidtight flexible metal conduit shall be Sealtite, Type UA, manufactured by the Anaconda Metal Hose Div.; Anaconda American Brass Co.; American Flexible Conduit Co., Inc.; Universal Metal Hose Co. or equal.

2. Fittings used with liquidtight flexible metal conduit shall be of the screw-in type as manufactured by the Thomas & Betts Co.; Crouse-Hinds Co. or equal.

D. Flexible Couplings

1. Flexible couplings shall be type ECGJH as manufactured by the Crouse-Hinds Co.; Appleton Electric Co.; Killark Electric Manufacturing Co. or equal.

E. Boxes and Fittings

1. Explosion-proof boxes shall be designed for Class 1, Group D, Division 1 hazardous locations. They shall be cast aluminum, with stainless steel hinged covers and stainless steel hardware and bolts; Type EJB-N4 as manufactured by the Crouse-Hinds Co.; Appleton Electric Co.; Adalet-PLM or equal.
2. Cast aluminum boxes and fittings shall be copper free aluminum with cast aluminum covers and stainless steel screws as manufactured by the Killark Electric Co.; Crouse-Hinds Co.; Appleton Electric Co.; or equal.
3. Cast aluminum device boxes shall be Type FD. All cast aluminum boxes and fittings shall be copper-free aluminum with cast aluminum covers and stainless steel screws as manufactured by the Killark Electric Co.; Crouse-Hinds Co.; L. E. Mason Co. or equal.
4. Cast aluminum fittings (C's, T's, LB's, etc.) shall be of the mogul design (with rollers) as manufactured by Appleton Electric Co.
5. Conduit hubs shall be of the grounding type as manufactured by Myers Electric Products, Inc. or equal.
6. Conduit wall seals for new concrete walls below grade shall be O.Z./Gedney Co., Type WSK; Spring City Electrical Manufacturing Co., Type WDP or equal.
7. Conduit wall seals for cored holes shall be Type CSML as manufactured by the O.Z./Gedney Co. or equal.
8. Conduit wall and floor seals for sleeved openings shall be Type CSMI as manufactured by the O.Z./Gedney Co. or equal.
9. Combination expansion-deflection fittings embedded in concrete shall be Type XD as manufactured by the Crouse-Hinds Co.; O.Z./Gedney Co.; Spring City Electrical Mfg. Co. or equal.
10. Combination expansion-deflection fittings installed exposed shall be Type XJ as manufactured by Crouse-Hinds Co.; O.Z. Gedney Co.; Spring City Electrical Mfg. Co. or equal.
11. Explosion proof fittings shall be as manufactured by the Crouse-Hinds Co.; Appleton Electric Co.; O.Z./Gedney Co. or equal.
12. Conduit sealing bushings shall be O.Z./Gedney, Type CSB or equal.

13. Elbows and couplings shall be aluminum.

F. Conduit Mounting Equipment

1. 316 Stainless steel channel with 316 stainless steel hardware (hangers, rods, backplates, beam clamps, fasteners, anchors, nuts, washers, etc.) shall be used in process areas, as shown on the drawings, in areas designated "WET", "DAMP" and "CORROSIVE" on the Drawings and in outdoor locations. All channel and hardware shall be resistant to the chemicals present in the area in which it is used.
2. Expansion anchors (minimum 3/8" diameter) shall be equal to Kwik-Bolt as manufactured by the McCulloch Industries, Minneapolis, MI; Wej-it by Wej-it Expansion Products, Inc., Bloomfield, CO; or Kwik-Bolt II as manufactured by the Hilti Fastening Systems, Inc, Tulsa, OK. The length of expansion bolts shall be sufficient to place the wedge portion of the bolt a minimum of 1-in behind the steel reinforcement. Apply anti-seize compound to all nuts and bolts. Supports installed without the approved compound shall be dismantled and correctly installed, at no cost to the Owner.

G. Wall and Floor Slab Opening Seals

1. Wall and floor slab openings shall be sealed with "FLAME-SAFE" as manufactured by the Thomas & Betts Corp.; Pro Set Systems; Neer Mfg. Co.; Specified Technologies, Inc. or equal.

2.02 WIRE, CABLE AND ACCESSORIES

- A. Wires and cables shall be of annealed, 98 percent conductivity, soft drawn copper.
- B. All conductors shall be stranded, except that lighting and receptacle wiring may be solid.
- C. Except for control, signal and instrumentation circuits, wire smaller than No. 12 AWG shall not be used.
- D. Wire for lighting, receptacles and other circuits not exceeding 150 Volts to ground shall be NEC Type THHN/THWN as manufactured by Okonite Co.; Southwire Co.; Pirelli Corp., or equal.
- E. Wire for circuits over 150 Volts to ground shall be NEC type XHHW-2 for sizes up to No. 4/0 AWG and Type RHW for sizes greater than No. 4/0 AWG as manufactured by Okonite Co.; Southwire Co., or equal.
- F. Wire for control, status and alarm circuits shall be No.14 AWG NEC type XHHW-2, 600 V, stranded as manufactured by Okonite Co.; Southwire Co., or equal.
- G. Process instrumentation wire shall be twisted pair, 600 V, cross linked polyethylene insulated, aluminum tape shielded, polyvinyl chloride jacketed type "XLP" as manufactured by the Rockbestos Co., or equal.
- H. Cable for 4-20 mA instrumentation, potentiometer, RTD and similar analog circuits shall be multi-conductor twisted and shielded.

1. Single pair cable:
 - a. Conductors: 2 No. 16 AWG stranded and twisted
 - b. Insulation: XLP
 - c. Shield: 100 percent tape with drain wire
 - d. Jacket: PVC with UL and manufacturers identification
2. Three conductor (triad) cable:
 - a. Conductors: 3 No. 16 AWG stranded and twisted
 - b. Insulation: XLP
 - c. Shield: 100 percent tape with drain wire
 - d. Jacket: PVC with UL and manufacturers identification
 - e. Multiple pair cables (where shown on the Drawings):
 - f. Conductor: Multiple 2 No. 16 AWG stranded and twisted
 - g. Insulation: XLP
 - h. Shield: Individual pairs and overall shielded with 100 percent tape and drain wire
 - i. Jacket: PVC with UL manufacturers identification
- I. Splices for power wiring shall be compression type connectors insulated with a heat shrink boot or outer covering and epoxy filling. Splice kits shall be as manufactured by Raychem; Ideal Industries; 3M Co. or equal.
- J. Motor connections shall be ring type mechanical compression terminations installed on the branch circuit wires and the motor leads and secured with bolt, nut and springwasher. Connections shall be insulated with a Raychem Type RVC, roll-on stub insulator or equal.
- K. Termination connectors for control wiring shall be of the locking fork-end (upturned leg ends) type as manufactured by Ideal Industries; 3M Co.; Panduit Corp. or equal.
- L. Splices for control wiring shall be insulated compression type connectors of the expanded vinyl insulated parallel or pigtail type as manufactured by Ideal Industries; 3M Co.; Panduit Corp. or equal.
- M. Termination connectors for shielded instrumentation wiring shall be of the locking fork-end (upturned leg ends) type as manufactured by Ideal Industries; 3M Co.; Panduit Corp. or equal.
- N. Wire markers shall be "Omni-Grip" as manufactured by the W.H. Brady Co.; Thomas & Betts Co.; 3M Co. or equal.
- O. Wire and cables with diameters exceeding the capacity of the "Omni-Grip" shall be marked with pre-printed, self-adhesive vinyl tapes as manufactured by the W.H. Brady Co.; Panduit Corp. or equal.

2.03 MISCELLANEOUS EQUIPMENT

- A. Disconnect Switches
 1. Disconnect switches shall be heavy-duty, quick-make, quick-break, visible blades, 600 Volt, 3 Pole with full cover interlock, interlock defeat and flange mounted operating handle.

2. NEMA 4X enclosures shall be 316 stainless steel.
3. NEMA 7 enclosures shall be cast aluminum.
4. Switches shall be as manufactured by the Square D Co.; Cutler Hammer Co.; General Electric Company; Siemens Company or equal.

B. Polyethylene Warning Tape

1. Warning tape shall be red polyethylene film, 6-in minimum width.
2. Warning tape shall be W.H. Brady Co., Catalog No. 91296 or equal.

C. Equipment Mounting Stands

1. Field mounted instruments, disconnects, power panels, etc, shall be mounted on 316 stainless steel stands as specified herein or as shown on the Drawings.
2. Where clearance requirements for stands may not be maintained, the Engineer may direct equipment to be wall-mounted adjacent to the motor or device, but in no case shall the distance from the motor or device to the control station exceed 3-ft.

D. Panelboards

1. Panelboards shall be in accordance with the Underwriter Laboratories, Inc. "Standard for Panelboards" and "Standard for Cabinets and Boxes" and shall be so labeled where procedures exist. Panelboards shall also comply with NEMA Standard for Panelboards and the National Electrical Code.
2. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.
3. 120/240 Volt, single phase, 3 Wire and 120/208 Volt, 3 Phase, 4 Wire panelboards shall be Sentron Type P1 as manufactured by Siemens; Type NQOD by Square D Co.; Type Pow-R-Line C by Cutler-Hammer; or Type AQ as manufactured by the General Electric Co.
4. NEMA 3, 4 and 12 panelboards shall be type DVP or DHP as required by voltage application; manufactured by the Crouse-Hinds Company or equal.
5. Rating
 - a. All panelboards shall be rated for the intended voltage.
 - b. Circuit breaker panelboards shall be fully rated for the specified circuit breaker fault current interrupting capacity. Series connected short circuit ratings will not be acceptable.
6. Buses
 - a. Bus bars for the mains shall be of copper. Full size neutral bars shall be included. Phase bussing shall be full height without reduction. Cross connectors shall be copper.
 - b. Neutral bussing shall have a suitable lug for each outgoing feeder requiring a neutral connection.

- c. Spaces for future circuit breakers shall be bussed for the maximum device that can be fitted into them.
 - d. Equipment ground bars shall be furnished.
- 7. Circuit Breakers
 - a. Panelboards shall be equipped with circuit breakers.
 - b. Circuit breakers shall be molded case, bolt-in type.
 - c. Each circuit breaker used in 120/240 Volt panelboard shall have an interrupting capacity of not less than 10,000 amperes, RMS symmetrical.
 - d. Circuit breakers shall be as manufactured by the panelboard manufacturer.
- E. Surge Protective Devices (SPD)
 - 1. SPDs shall be UL 1449, 3rd Edition listed.
 - 2. All SPDs on the entire project must be provided by the same SPD manufacturer to ensure commonality and ease of Owner maintenance.
 - 3. Panelboard SPDs shall be:
 - a. SPD shall be a multi-stage non-parallel protector. SPD's minimum surge current capacity shall be 250kA per phase (L-N plus L-G) and 125kA per mode (L-N, L-G, L-L and N-G).
 - b. SPD shall be non-modular design. SPD shall provide the following monitoring features: dry contacts and audible alarm. SPD shall utilize a NEMA 12 enclosure or better.
 - c. SPDs shall be as manufactured by Surge Suppression Inc. – SDL Series, LEA International Inc – S1 Series, Current Technology – CGP Series, Liebert ACV-III Series, or approved equal.

2.04 UNDERGROUND SYSTEM

- A. All concrete and reinforcing steel shall be as specified in Division 3, but the responsibility of furnishing and installing the material shall be that of this Section.
- B. All trenching and surface restoration shall be as specified in Division 2, but the responsibility of furnishing and installing the material shall be that of this Section.
- C. Raceways shall be polyvinyl chloride conduit encased in concrete except that rigid aluminum conduit shall be used for 600 Volt shielded wire and data highway wiring.
- D. Handholes shall be precast concrete, heavy-duty type, designed for a Class H-20 wheel load and conform to ASTM C478. Precast units shall be as manufactured by Chase Precast Corp.; American Precast Co. or equal and constructed to dimensions as shown on the Drawings.
- E. Handhole frames and covers shall be cast iron, heavy duty type for Class H-20 wheel loading.

2.05 GROUNDING

- A. Ground rods shall be 3/4-in by 10-ft copper clad steel and constructed in accordance with UL 467. The minimum copper thickness shall be 0.25 mm. Ground rods shall be Copperweld or equal.
- B. Grounding conduit hubs shall be malleable iron type similar to Thomas & Betts Co.; Cat No. 3940 (3/4-in conduit size) by Burndy; O.Z./Gedney Co. or equal, and of the correct size for the conduit.
- C. Waterpipe ground clamps shall be cast bronze saddle type, similar to Thomas & Betts Co. Cat. No. 2 (1/2-in, 3/4-in, or 1-in size) or equal by Burndy; O.Z./Gedney Co. or equal, and of the correct size for the pipe.
- D. Buried grounding connections shall be by Cadweld process, or equal exothermic welding system.

PART 3 EXECUTION

3.01 SLEEVES AND FORMS FOR OPENINGS

- A. Provide and place all sleeves for conduits penetrating floors, walls, partitions, etc. Locate all necessary slots for electrical work and form before concrete is poured.
- B. Exact locations are required for stubbing-up and terminating concealed conduit. Obtain shop drawings and templates from equipment vendors or other subcontractors and locate the concealed conduit before the floor slab is poured.
- C. Where setting drawings are not available in time to avoid delay in scheduled floor slab pours, the Engineer may allow the installations of such conduit to be exposed. Requests for this deviation must be submitted in writing. No additional compensation for such change will be allowed.
- D. Seal all openings, sleeves, penetration and slots.

3.02 CUTTING AND PATCHING

- A. Cutting and patching shall be done in a thoroughly workmanlike manner and be in compliance with modifications and repair to concrete. Sawcut concrete and masonry prior to breaking out sections.
- B. Core drill holes in concrete floors and walls as required.
- C. Install work at such time as to require the minimum amount of cutting and patching.
- D. Do not cut joists, beams, girders, columns or any other structural members.
- E. Cut opening only large enough to allow easy installation of the conduit.
- F. Patching to be of the same kind and quality of material as was removed.

- G. The completed patching work shall restore the surface to its original appearance or better.
- H. Patching of waterproofed surfaces shall render the area of the patching completely waterproofed.
- I. Remove rubble and excess patching materials from the premises.
- J. When existing conduits are cut at the floor line of wall line, they shall be filled with grout of suitable patching material.

3.03 INSTALLATION

- A. Any work not installed according to the Specifications shall be subject to change as directed by the Engineer. No extra compensation will be allowed for making these changes.
- B. Electrical equipment shall be protected at all times against mechanical injury or damage by water. Electrical equipment shall not be stored outdoors. Electrical equipment shall be stored in dry permanent shelters. Do not install electrical equipment in its permanent location until structures are weather-tight. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and tested as directed by the Engineer, or shall be replaced at no additional cost at the Engineer's discretion.
- C. Equipment that has been damaged shall be replaced or repaired by the equipment manufacturer, at the Engineer's discretion.
- D. Repaint any damage to factory applied paint finish using touch-up paint furnished by the equipment manufacturer. The entire damaged panel or section shall be repainted per the field painting specifications in Section 09902, at no additional cost to the Owner.
- E. Coordinate the conduit installation with other trades and the actual supplied equipment.
- F. Install each 3 phase circuit in separate conduit.
- G. Unless otherwise approved by the Engineer, conduit installed interior to the building shall be installed exposed; conduit installed exterior to the building shall be concealed.
- H. Verify the exact locations and mounting heights of switches and receptacles prior to installation.
- I. Exact locations of electrical equipment shall be determined by the Contractor and approved by the Engineer during construction. Obtain information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.
- J. Mount boxes for surface mounted panelboards so there is at least 1/2-in air space between the box and the wall.
- K. Connect panelboard branch circuit loads so that the load is distributed as equally as possible between the phase busses.

- L. Type circuit directories giving location and nature of load served. Install circuit directories in each panelboard.
- M. Install markers on the front cover of all panelboards which identify the voltage rating. Markers shall be made of self sticking B-500 vinyl cloth printed with black characters on an Alert Orange background, 2-1/4-in high by 9-in wide, Style A as manufactured by W.H. Brady Co. or equal.
- N. Install a 1-in by 3-in laminated plastic nameplate with 1/4-in white letters on a black background on each panelboard. Nameplate lettering shall be as shown on the Drawings. Nameplates shall be stainless steel screw mounted.

3.04 RACEWAYS, BOXES AND FITTINGS

A. Raceway Applications

- 1. Except where otherwise shown on the Drawings, or specified, all wiring shall be in rigid aluminum conduit.
 - 2. Schedule 80 PVC conduit shall be used where shown on the Drawings and in chemical rooms, chlorinator rooms and chlorine storage areas or areas designated "CORROSIVE" on the Drawings.
 - 3. Rigid aluminum conduit or Schedule 80 PVC shall be used underground. Where schedule 80 PVC is used all elbows shall be rigid aluminum.
 - 4. All conduit of a given type shall be the product of one manufacturer.
- B. Unless otherwise specified herein or shown on the Drawings, all boxes shall be metal.
- C. Exposed switch, receptacle and lighting outlet boxes and conduit fittings shall be cast aluminum.
- D. Concealed switch, receptacle and lighting outlet boxes shall be pressed steel. Welded seamed boxes will not be permitted.
- E. Terminal boxes, junction boxes and pull boxes shall have NEMA ratings suitable for the location in which they are installed, as specified in this Section.
- F. Combination expansion-deflection fittings shall be used where conduits cross structure expansion joints. Refer to Structural Drawings for expansion joint locations. Provide bonding jumpers around fittings.
- G. Conduit wall seals shall be used where underground conduits penetrate walls or at other locations shown on the Drawings.
- H. Conduit sealing bushings shall be used to seal conduit ends exposed to the weather and at other locations shown on the Drawings.

- I. No conduit smaller than 3/4 inch electrical trade size shall be used, nor shall any have more than the equivalent of three 90 degree bends in any one run. Pull boxes shall be provided as required or directed.
- J. No wire shall be pulled until the conduit system is complete in all details; in the case of concealed work, until all rough plastering or masonry has been completed; in the case of exposed work, until the conduit system has been completed in every detail.
- K. The ends of all conduits shall be tightly plugged to exclude dust and moisture during construction.
- L. Conduit supports, other than for underground raceways, shall be spaced at intervals of 8-ft or less, as required to obtain rigid construction.
- M. Single conduits shall be supported by means of aluminum one-hole pipe clamps in combination with aluminum one-screw back plates, to raise conduits from the surface. Multiple runs of conduits shall be supported on trapeze type hangers with steel horizontal members and threaded hanger rods. The rods shall be not less than 3/8-in diameter. Surface mounted panel boxes, junction boxes, conduit, etc, shall be supported by spacers to provide a minimum of 1/2-in clearance between wall and equipment.
- N. Conduit hangers shall be attached to structural steel by means of beam or channel clamps. Where attached to concrete surfaces, concrete expansion anchors shall be provided.
- O. All conduits on exposed work, within partitions and above suspended ceilings, shall be run at right angles to and parallel with the surrounding wall and shall conform to the form of the ceiling. No diagonal runs will be allowed. Bends in parallel conduit runs shall be concentric. All conduit shall be run perfectly straight and true.
- P. Conduit terminating in pressed steel boxes shall have double locknuts (aluminum) and insulated grounding bushings.
- Q. Conduit terminating in gasketed enclosures shall be terminated with grounding type conduit hubs.
- R. Conduits containing equipment grounding conductors and terminating in sheet steel boxes shall have insulated throat grounding bushings with lay-in type lugs.
- S. Conduits shall be installed using threaded fittings unless otherwise specified herein.
- T. Liquidtight flexible metal conduit shall be used for all motor terminations, the primary and secondary of transformers, generator terminations and other equipment where vibration is present.
- U. Flexible couplings shall be used in hazardous locations for all motor terminations and other equipment where vibration is present.
- V. Aluminum fittings and boxes shall be used with aluminum conduit. Aluminum conduit shall not be imbedded in concrete containing chlorides, unwashed beach sand, sea water, or coral bearing aggregates. Aluminum conduit shall be isolated from other metals with heat shrink tubing (Raychem or equal) or plastic-coated hangers. Strap wrenches shall be

used for tightening aluminum conduit. Pipe wrenches, channel locks, chain wrenches, pliers, etc. shall not be used.

- W. All threads on aluminum conduit and fittings shall be cleaned and coated with No-Oxide compound before installing.
- X. Aluminum conduit installed in concrete or below grade shall be completely covered with two (2) coats of bitumastic paint or with heat shrink tubing (Raychem or equal).
- Y. Where conduits pass through openings in walls or floor slabs, the remaining openings shall be sealed against the passage of flame and smoke.
- Z. PVC conduit to non-metallic and metallic box connections shall be made with sealing rings, with a stainless steel retainer as manufactured by Thomas & Betts Co.
- AA. Conduit ends exposed to the weather shall be sealed with conduit sealing bushings.
- BB. Expansion fittings shall be used on exposed runs of PVC conduit where required for thermal expansion. Installation and number of fittings shall be as provided per the NEC and approved by the PVC conduit manufacturer.
- CC. All conduit entering or leaving a motor control center, switchboard or other multiple compartment enclosure shall be stubbed up into the bottom horizontal wire-way or other manufacturer designated area, directly below the vertical section in which the conductors are to be terminated.
- DD. Conduit sealing and drain fittings shall be installed in areas designated as NEMA 7.
- EE. Spare conduits and conduit stub-outs for future construction shall be provided with threaded PVC end caps at each end.
- FF. No unbroken run shall exceed 300 feet in length. This length shall be reduced by 75 feet for each 90 degree elbow.
- GG. Aluminum conduit entering manholes and below grade pull boxes shall be terminated with grounding type bushings and connected to a 5/8" x 10' rod with a #6 bare copper wire.
- HH. Underground circuits shall be installed directly to the respective motor control centers, lighting panels, etc., except stainless steel pull boxes shall be wall mounted on structures to eliminate excessive bends. With prior written approval, below grade pull boxes may be used. Splices shall not be made in above or below grade pull boxes unless otherwise indicated on the plans and approved in writing by the Engineer.
- II. All conduits shall have a 4-inch concrete housekeeping pad at all slab and grade penetrations. The housekeeping pad shall have 45 degree, 3/4-inch chamfer at all exposed edges.
- JJ. All risers from underground, concrete pads, floors, etc. shall be provided with heat shrink tubing (Raychem Co. or equal) from a point 1 foot-0-inch below bottom of slab or grade to a point not less than 6 inches above grade or surface of slab.

- KK. Existing conduits are to be reused only where specifically noted on the drawings. Mandrels shall be pulled through all existing conduits which will be reused and through all new conduits 2-in in diameter and larger prior to installing conductors.
- LL. 3/16-in polypropylene pull lines shall be installed in all new conduits noted as spares or designated for future equipment.
- MM. Where no size is indicated for junction boxes, pull boxes or terminal cabinets, they shall be sized in accordance with the requirements of NEC Article 314.
- NN. Conduits shall not cross pipe shafts, access hatches or vent duct openings. They shall be routed to avoid such present or future openings in floor or ceiling construction.
- OO. The use of running threads is prohibited. Where such threads are necessary, a 3-piece cast aluminum union shall be used.
- PP. Conduits passing from heated to unheated spaces, exterior spaces, refrigerated spaces, cold air plenums, etc, shall be sealed with "Duxseal" as manufactured by Manville or seal fitting to prevent the accumulation of condensation.
- QQ. All field cut ends of hot dipped galvanized mounting channel shall be cleaned and painted with cold galvanizing compound before installation.
- RR. All underground control and instrumentation conduits shall be separated from power conduits by a minimum of 12 inches unless specifically noted otherwise. Crossing of control and instrumentation conduits with power conduits shall be kept to a minimum and where they must cross they shall cross at 90 degree angles.

3.05 WIRE, CABLE AND ACCESSORIES

- A. Uniquely identify all wires, cables and each conductor of multi-conductor cables (except lighting and receptacle wiring) at each end with wire and cable markers.
- B. Use lubrications to facilitate wire pulling. Lubricants shall be UL approved for use with the insulation specified.
- C. All wire shall be color coded or coded using electrical tape in sizes where colored insulation is not available. Where tape is used as the identification system, it shall be applied in all junction boxes, and other accessible intermediate locations as well as at each termination.
- D. The following coding shall be used:

<u>System</u>	<u>Wire</u>	<u>Color</u>
240/120 Volts	Neutral	White
1-Phase, 3-Wire	Line 1	Black
	Line 2	Red

- E. Power conductors: Terminations shall be die type or set screw type pressure connectors as specified. Splices (where allowed) shall be die type compression connector and

waterproof with heat shrink boot or epoxy filling. Aluminum conductors (where specified) shall employ terminations and splices specifically designed for aluminum conductors.

- F. Control Conductors: Termination on saddle-type terminals shall be wired directly with a maximum of two conductors. Termination on screw type terminals shall be made with a maximum of two spade connectors. Splices (where allowed) shall be made with insulated compression type connectors.
- G. Instrumentation Signal Conductors (including graphic panel, alarm, low and high level signals): terminations same as for control conductors. Splices allowed at instrumentation terminal boxes only.
- H. Except where permitted by the Engineer no splices will be allowed in manholes, handholes or other below grade located boxes.
- I. Splices shall not be made in push button control stations, control devices (i.e., pressure switches, flow switches, etc), conduit bodies, etc.
- J. Instrumentation cables shall be installed in rigid aluminum raceways as specified. All circuits shall be installed as twisted pairs or triads. In no case shall a circuit be made up using conductors from different pairs or triads. Triads shall be used wherever three wire circuits are required.
- K. Terminal blocks shall be provided at all instrument cable junction and all circuits shall be identified at such junctions.
- L. Shielded instrumentation wire, shall be run without splices between instruments, terminal boxes, or panels.
- M. Shields shall be grounded as recommended by the instrument manufacturer and isolated at all other locations. Terminal blocks shall be provided for inter-connecting shield drain wires at all junction boxes. Where individual circuit shielding is required, each shield circuit shall be provided with its own block.

3.06 MOTORS

A. Installation

- 1. Motor Connections: All motors shall be connected to the conduit system by means of a short section 18-inch minimum of liquid tight conduit unless otherwise indicated.
- 2. Low Voltage: For wire sizes #8 AWG and larger, long barrel tin-plated copper compression (hydraulically pressed) type connections (Burndy Co., or equal) shall be installed on the branch circuit wires and the motor leads. Bolted connections shall utilize products which are rated for vibration applications (bolt, nut and spring washer). All connections shall be insulated with heavy duty heat shrinkable material (Raychem Corp. or equal).

B. Tests and Checks

1. The following tests shall be performed on all motors after installation but before putting motors into service.
 - a. The Contractor shall megger (1000 volts DC) each motor winding before energizing the motor, and, if insulation resistance is found to be low, shall notify the Engineer and shall not energize the motor. The following table gives minimum acceptable insulation resistance in megohms at various temperatures and for various voltages with readings being taken after one (1) minute of megger test run.

<u>Winding Temperature</u>		<u>Degrees Voltage</u>	
<u>F</u>	<u>C</u>	<u>115 V.</u>	<u>230 V.</u>
37	3.9	60	108
50	10	32	60
68	20	13	26
86	30	5.6	11
104	45	2.4	4.5
122	50	1	2
140	60	0.50	0.85

- b. The Contractor shall check all motors for correct clearances and alignment and for correct lubrication, and shall lubricate if required in accordance with Manufacturer's instructions. The Contractor shall check direction of rotation of all motors and reverse connections if necessary. The correction for wrong rotational direction shall be made at the motor.
 - c. All tests shall meet the requirements of, but not be limited to, IEEE 43, 85 and 112. Efficiency tests for IEEE 112 shall include Method B.
 - d. The Contractor shall provide to the Engineer a typed list of all motors 1 HP and larger listing the no load motor current and voltage and the full load current and voltage. Any phase current imbalance greater than 10% shall be reported to the Engineer.
2. Field testing and commissioning shall be done in accordance with the latest revision of the "Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems" published by the InterNational Electrical Testing Association (NETA Standard ATS).

3.07 UNDERGROUND SYSTEM

- A. Install raceways to drain away from buildings.
- B. Reinforce raceway banks when conduits pass over newly excavated pipes.
- C. The minimum cover for raceway banks shall be 24-in unless otherwise permitted by the Engineer.
- D. Swab all raceways clean before installing cable.
- E. Plug spare raceways and seal them watertight at all manholes, buildings and structures.
- F. Seal the ends of raceways and make watertight at all handholes, buildings and structures.

3.08 GROUNDING

- A. The service entrance equipment ground bus shall be grounded to a ¾-inch ground rod and to the ground as indicated on the Drawings. Run grounding electrode conductors in Schedule 80 PVC conduits and seal conduits watertight. If the connections are painted, disassemble them and re-make them with new fittings.
- B. Install equipment grounding conductors with all feeders and branch circuits.
- C. Bond all steel building columns in new structures together with ground wire in rigid conduit and connect to the distribution equipment ground bus.
- D. Ground wire connections to structural steel columns shall be made with long barrel type one-hole heavy duty copper compression lugs, bolted through 1/2-in maximum diameter holes drilled in the column web, with stainless steel hex head cap screws and nuts.
- E. Seal exposed connections between different metals with No-Oxide Paint Grade A or equal.
- F. Lay all underground grounding conductors slack and, where exposed to mechanical injury, protect by pipes or other substantial guards. If guards are iron pipe, or other magnetic material, electrically connect conductors to both ends of the guard. Make connections as specified herein.
- G. Care shall be taken to ensure good ground continuity, in particular between the conduit system and equipment frames and enclosures. Where necessary, jumper wires shall be installed.
- H. All grounding type receptacles shall be grounded to the outlet boxes with a No. 12 THW green conductor connected to the ground terminal of the receptacle and fastened to the outlet box by means of a grounding screw.
- I. Test the grounding system. Resistance to ground testing shall be performed during dry season. Submit test results in the form of a graph showing the number of points measured (12 minimum) and the numerical resistance to ground.
- J. Testing shall be performed before energizing the distribution system.
- K. Notify the Engineer immediately if the resistance to ground for any building or system is greater than five ohms.

END OF SECTION



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