

SECTION 01010

SUMMARY OF WORK

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Work to be performed under this Contract shall consist of furnishing all tools, equipment, materials, supplies, and manufactured articles; for furnishing all transportation and services, including fuel, power, water, and essential communications; and for the performance of all labor, work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The Work shall be complete, and all work, materials, and services not expressly shown or called for in the Contract Documents which may be necessary for the complete and proper construction of the Work in good faith shall be performed, furnished, and installed by the Contractor as though originally so specified or shown, at no increase in cost to the Owner.
- B. Prior to construction, the Contractor shall verify locations (horizontal and vertical) of existing utilities. The utility verifications consist of excavation to verify tie-in points and to locate potential conflicts that may affect the Work. The Contractor will be responsible for the coordination of this Work with the associated utility owners and permitting agencies having jurisdiction over the specific locations to be verified. Florida One Call shall be contacted by the Contractor a minimum of 48 hours prior to any excavation.

1.02 SCOPE

- A. The work associated with the Town of Jupiter U.S. 1 / S.R. 5 Bridges, Watermain Relocation project will consist of abandoning existing watermains on two FDOT low level bridges along U.S. 1 adjacent to Burt Reynolds Park and installing new subaqueous crossings as detailed below:
 - 1. The installation of two sections of 12" HDPE pipe via horizontal directional drilling under both the north and south channels of Lake Worth Creek along U.S. 1 north of Coastal Way and south of A1A in the vicinity of Burt Reynolds Park.
 - 2. Installation of 10" and 12" PVC watermain, fittings, mechanical restraints, thrust blocks, air release valves, subaqueous crossing test pits, isolation gate valves, wet taps, and all pipeline flushing, pigging, hydrostatic testing and disinfection in order to provide complete functioning systems under both channels of Lake Worth Creek.
- B. It is the intent of the Owner to obtain complete and working installations under this Contract and any items of labor, materials, or equipment which may reasonably be assumed as necessary to accomplish this Work shall be supplied whether or not specifically shown on the Drawings or described herein. Maintenance of existing operations is mandated throughout the construction period.

- C. The Contractor shall not operate any valves (existing or new) without Owner's (Town of Jupiter Utilities) approval and assistance.

1.03 WORK BY OTHERS

- A. The Contractor shall cooperate fully with all utility forces of the Owner or other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the Work, and shall schedule the Work so as to minimize interference with said relocation, altering, or rearranging of facilities.
- B. When two or more contracts are being executed at same time on the same or adjacent land in such manner that work on one contract may interfere with that on another, the Owner shall determine the sequence and order of the work. When the territory of one contract is the necessary or convenient means of access for the execution of another contractor, such privilege of access or any other reasonable privilege may be granted by the Owner to Contractor.

1.04 LOCATION OF THE PROJECT

The project is located north of Coastal Way and south of A1A along U.S. Hwy 1 adjacent to Burt Reynolds Park in Jupiter, Florida.

1.05 CONTRACT DOCUMENTS

The work to be performed is shown on the set of Contract Drawings and Specifications prepared by the Town of Jupiter Utilities Department entitled:

Town of Jupiter Utilities
JW 09-20
U.S. 1 / S.R. 5 Bridges, Watermain Relocation Plans

1.06 CONTRACTOR FURNISHED MATERIAL AND EQUIPMENT

- A. All equipment, materials, instruments, or devices incorporated in this project shall be new and unused, unless indicated otherwise in the Contract Documents and shall be the products of reliable manufacturers who, unless otherwise specified, have been regularly engaged in the manufacture of such material and equipment for at least five years. Procedures and additional requirements regarding manufacturer's experience and substitutions are included in Section 01300 entitled "Submittals".

1.07 ITEMS SPECIFIED ON DRAWINGS

- A. Certain items of material and/or equipment, and their installation may be specified on the Drawings and not mentioned in the Specifications. Such items are to be considered as both shown on the Drawings and noted in the Specifications and be provided by the Contractor in accordance with the specification on the Drawings.

1.08 FIELD LAYOUT OF WORK

- A. All Work under this Contract shall be constructed in accordance with the lines and grades shown on the Contract Drawings or as directed by the Owner. Elevations of existing ground, structures, and appurtenances are believed to be reasonably correct but are not guaranteed to be absolute and therefore are presented only as an approximation. Any error or apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the stake-out survey shall be referred immediately to the Owner or Engineer for interpretation or correction.
- B. All survey work for construction control purposes shall be made by the Contractor at his expense.
- C. The Contractor shall establish all base lines for the location of the principal component parts of the Work together with benchmarks and grade stakes adjacent to the Work. Based upon the information provided by the Contract Drawings, the Contractor shall develop and make all detailed surveys necessary for construction. Information and location of existing bench marks are indicated on the Drawings.
- D. The Contractor shall have the responsibility to carefully preserve the benchmarks, reference points, and stakes. In case of destruction thereof by the Contractor or resulting from his negligence, he shall be held liable for any expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points, and stakes.
- E. Existing or new control points, property markers, and monuments that will be established or are destroyed during the normal causes of construction shall be re-established by the Contractors, and all reference ties recorded therefore shall be furnished to the Engineer. All computations necessary to establish the exact position of the Work shall be made and preserved by the Contractor.
- F. The Owner may check all or any portion of the Work, and the Contractor shall afford all necessary assistance to the Owner in carrying out such checks. Any necessary corrections to the Work shall be performed immediately by the Contractor as part of its responsibilities for the accuracy or completeness of his Work.

1.09 OWNER USE OF THE PROJECT SITE

- A. The Owner may use all of the existing facilities during any time within the period of construction for the conduct of the Owner's normal operations. The Contractor shall cooperate with the Owner to minimize interference with the Contractor's operations and to facilitate the Owner's operations.

1.10 CONTRACTOR USE OF PROJECT SITE

- A. The Contractor's use of the project site shall be limited to his construction operations for this project only, including on-site storage of materials, on-site fabrication facilities, and field offices.

- B. Contractor is expected to work between the hours of 7:00 a.m. and 5:00 p.m. EST, Monday through Friday. All work requiring inspections or Owner coordination shall occur between 8:00 am and 4:00 pm EST, Monday through Friday. Requests for approval to work on Saturdays, Sundays, or Town observed holidays must be submitted by the Contractor in writing to the Owner and subsequently approved by the Owner in writing at least 72 hours in advance of the period proposed for work outside of the normal work hours stated above. The Contractor's written submittal shall also set forth the proposed schedule for the work in order to give the Owner ample time to arrange for his personnel to be at the site of the Work if necessary. The Contractor shall pay for all engineering and inspection services (including TOJ personnel overtime) and other additional expenses incurred for approved project work outside of the normal work hours. Such expenses shall be a subsidiary obligation of the Contractor and will be paid to the Owner via a deductive change order equal to the amount of overtime pay expended, and no extra payment shall be made by the Owner on account of such overtime work.
- C. The Contractor shall abide by all local noise ordinances. Any violation of a noise ordinance shall be corrected immediately by the Contractor at his sole expense.

1.11 PARTIAL UTILIZATION OF THE WORK BY OWNER

- A. The Contractor is hereby advised that the Owner may accept the responsibility for the maintenance and protection of a specific portion of the project if utilized prior to completion. However, the Contractor shall retain full responsibility for satisfactory operation of the total project.

1.12 PRE-CONSTRUCTION VIDEO

- A. The Contractor shall video the entire project site including all concrete and asphalt pavements, curbs, fencing, vegetation and any other improvements to remain. The original and two copies of the video shall be turned over and approved by the Owner prior to mobilization of construction activities. The video shall be recorded in DVD format by a professional videographer specializing in pre-construction videos. The video shall be narrated and clearly identify existing site conditions prior to construction. It is in the contractor's best interest to ensure that the conditions of the facilities prior to construction are well documented.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 -- GENERAL

1.01 GENERAL

- A. Payments to the Contractor shall be made on the basis of the Proposal bid items as full and complete payment for furnishing all materials, labor, tools, and equipment and for performing all operations necessary to complete the Work included in the Contract Documents. Such compensation shall also include payments for any loss or damages arising directly or indirectly from the Work, from any discrepancies between the actual quantities of work and those shown in the Contract Documents, or from any unforeseen difficulties which may be encountered during the prosecution of the Work until the final acceptance by the Owner.
- B. The prices stated in the proposal include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, and labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the Work as shown on the plans and specified herein. The Basis of Payment for an item at the price shown in the Proposal shall be in accordance with its description of the item in this Section and as related to the Work specified and as shown on the Drawings. Unit prices where used will be applied to the actual quantities furnished and installed in conformance with the Contract Documents.
- C. The Contractor's attention is called to the fact that the quotations for the various items of Work are intended to establish a total price for completing the Work in its entirety. Should the Contractor feel that the cost of any item of Work has not been established by the Schedule of Values or Measure and Payment, he shall include the cost for that Work in the other Bid Items so that his proposal for the project does reflect his total price for completing the Work in its entirety.

1.02 MEASUREMENT

- A. The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service, and accepted by the Owner in accordance with the Schedule of Payment Values as described in Section 01300 entitled "Submittals" unless otherwise specified. A representative of the Owner shall witness all field measurements.

1.03 PAYMENT ITEMS

- A. Item No. 1 – General Conditions/Contract Administration: The work included in this Item consists of the cost of complying with all general conditions of the construction contract and contract administration which includes: the costs of bonds and any required insurance as outlined in the Contract Documents; the cost of preparing, submitting and processing all shop drawings/submittals as outlined in the Contract Documents and any other requirements in the General Conditions. Payment will be made on a lump sum basis based on the percentage of the item completed and accepted by Owner.

- B. Item No. 2 – Indemnification: In recognition of Contractor's indemnification obligations, the Owner will pay to the Contractor the specific consideration of one hundred dollars (\$100.00). Payment of said specific consideration shall be made at the time of the payment of the first progress estimate and the Contractor shall acknowledge payment of this consideration by letter to the Owner after receipt of the progress payment.
- C. Item No. 3 – Mobilization/ Demobilization (may not exceed 10% of Total Bid): The work included in this Item consists of preparatory/final work and operations in mobilizing/demobilizing for beginning/ending work, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to/from the project site and for the establishment/de-establishment of the temporary environmental controls, provisions, state and local laws, regulations and any other pre-construction/post-construction expense (including pre-construction video, sanitary facilities, noise abatement provisions, etc.) necessary for the start /end of the work. Payment will be made on a lump sum basis based on the percentage of the item completed and accepted by Owner.
- D. Item No. 4 – Shop Drawings: The work included in this Item consists of the cost of preparing, submitting and processing all shop drawings/submittals as outlined in the Contract Documents. The Contractor shall submit to the Owner for review and acceptance a list of the anticipated submittals for the entire project, no later than ten (10) days after the date of Notice to Proceed. Initiation for payment of this bid item will not occur until the list of submittals is approved and accepted by the Owner. Failure to include an item on the anticipated submittal list does not relieve the Contractor from his responsibility to submit on the item. Payment will be made on a lump sum basis based on the percentage of the item completed and accepted by Owner.
- E. Item No. 5 – Maintenance of Traffic: The work included in this Item consists of maintenance of traffic including all labor, equipment and material required to meet the latest edition of FDOT Index 600, specification Section 01570, plan notes, submittal of MOT's to appropriate agencies for approval, implementation of maintenance of traffic plans, and maintenance of access to roadways and properties in service during construction activities. All labor, materials, and equipment shall be provided as needed to provide acceptable MOT for the life of the project. Payment will be made on a lump sum basis based on the percentage of the item completed and accepted by Owner.
- F. Item No. 6 – Bacteriological Sampling & Testing: The work included in this Item consists of bacteriological sampling and testing and is inclusive of all costs and work associated with collecting and testing bacteriological samples. The cost to install and maintain sample points shall be included in Items 18 and 19. If Contractor utilizes the Town of Jupiter Utilities Laboratory for bacteriological sampling and testing, there will be no cost associated with this pay item. If the Contractor utilizes an approved State Department of Health Laboratory (DOH Certified), payment will be made for the number of passing tests accepted by Owner. The Contractor will be responsible to pay for all failing tests.
- G. Item No. 7 – Horizontal Directional Drill 12" HDPE Pipe: The work included in this Item consists of all installation, labor and material costs for furnishing and installing high density polyethylene (HDPE) pipe by horizontal directional drilling including but not limited to: all unloading, stringing, trench excavation, temporary excavation, sheeting, shoring, dewatering; directional bore access and receiving pits; drilling equipment, pipe and fittings;

HDPE/PVC adapter fittings; providing, containing and disposing of drilling fluid; surveying/recording pipe alignment and depth; providing equipment and material to fusion weld pipe; protecting and supporting existing utilities; and all other labor, equipment and/or materials necessary for a complete HDPE pipe installation as intended by the Contract Documents. Payment will be made on a per linear foot basis for pipe installed and accepted by Owner as measured between the HDPE/PVC adapter fittings along the horizontal alignment of the pipe.

- H. Item No. 8 - Frac-Out Plan: The work included in this item consists of all labor materials, personnel, and equipment needed to implement a Frac-Out plan as required by the project permits and included on the Directional Bore Details Sheet of the Contract Drawings including but not limited to submitting to the Owner and permitting agencies for approval a written Frac-Out plan, adding dye to the drilling fluid, a vactor truck on site during drilling and an Environmental Scientist/Biologist on site during drilling under the River; a diver on-call (to be on site within 60 minutes) and a barge (on site within 24 hours) to transport the vactor truck and implement the Release Procedure and Drilling Mud Containment Plan within 24 hours in the event a Frac-out is confirmed. The Contractor will only be paid for the diver and the barge if they are used. A break down of the cost of this pay item shall be supplied to the Owner with the detailed schedule of values during the submittal process. Payment shall be made based on the level of activity needed to comply with the Frac-out plan.
- I. Item No. 9 - 12" C-900 PVC Pipe DIP: The work included in this Item consists of installation of 12" PVC C-900 watermain including, but not limited to furnishing, unloading, stringing, survey, layout, trench excavation, temporary excavation, sheeting, shoring, dewatering, pipe bedding material, ductile iron fittings, temporary/permanent plugs, deflecting as necessary, laying, restraining devices, thrust blocks, anchoring, backfilling, compacting, complying with the State of Florida Trench Safety Act, flushing, pressure testing, and disinfecting. Payment will be made per linear foot of pipe installed measured horizontally, including fittings, and accepted by Owner.
- J. Item No. 10 - 10" C-900 PVC Pipe and Fittings: The work included in this Item consists of installation of 10" C-900 PVC watermain including, but not limited to, furnishing, unloading, stringing, trench excavation, temporary excavation, sheeting, shoring, dewatering, pipe bedding material, fittings, temporary/permanent plugs, deflecting as necessary, laying, restraining devices, thrust blocks, anchoring, backfilling, compacting, and complying with the State of Florida Trench Safety Act, flushing, pressure testing and disinfection of pipe. Payment will be made per linear foot of pipe installed and measured horizontally including fittings and accepted by the Owner.
- K. Item No. 11 – Tie-In to Existing 10" DIP Watermain: The work included in this Item consists of but is not limited to all labor, equipment and material for trench excavation, temporary excavation, sheeting, shoring, dewatering, pipe bedding material, fittings, temporary/permanent plugs, coordination with Town of Jupiter Utilities for water shut offs restraining devices, concrete thrust blocks, fittings, cutting existing pipe, draining existing main, tying to existing main, backfill; compaction, and compliance with the State of Florida Trench Safety Act, and all appurtenant and miscellaneous items of work required to tie-in the newly installed watermain to existing DIP watermain. Payment will be made for each tie-in installed, completed, witnessed, and accepted by Owner.

- L. Item No. 12 – 10"X10" Wet Tap: The work included in this Item consists of furnishing and installing 10" x 10" Tapping Sleeves and valves including, but not limited to excavation, backfill, compaction, tapping the pipe, restraining devices, concrete thrust blocks, pressure testing, valve boxes, concrete pads for valve boxes with identification disc, painting the valve box cover and all appurtenant and miscellaneous items of work required to complete the Work. Payment will be made at the Contract Unit price for the number of installed, complete, witnessed, and accepted by the Owner.
- M. Item No. 13 – 10" Gate Valve: The work included in this Item consists of furnishing and installing a 10" restrained joint (RJ) gate valve including, but not limited the to valve, restraining devices, valve box, concrete pad for valve box with identification disc, painting the valve box cover and all appurtenances necessary to complete the Work. Payment will be made at the Contract Unit price for the number of valves installed, complete and accepted by the Owner.
- N. Item No. 14 – 10" Gate Valve Insertion: The work included in this Item consists of furnishing and inserting a 10" restrained joint (RJ) gate valve into a live (pressurized) potable watermain without service interruption including but not limited to excavation, backfill, compaction, furnishing and installing the valve, restraining devices, valve box, concrete pad for valve box with identification disc, painting the valve box cover and all tools, equipment and appurtenances necessary to complete the Work. Payment will be made at the Contract Unit price for each valve inserted, completed, witnessed, and accepted by the Owner.
- O. Item No. 15 – Remove and Dispose of Buried 10" DIP: The work included in this Item consists of cutting and removing buried 10" DIP watermain and includes but is not limited to excavation, clean backfill, backfilling, grading, compaction, isolation of piping to be removed, draining of water from pipe to be removed, and disposal of piping to be removed, restraint of adjacent existing pipe to be removed. Payment will be made at the Contract Unit price per linear foot of 10" ductile Iron pipe removed, disposed of and accepted by Owner.
- P. Item No. 16 – Remove and Dispose of 10" DIP from Bridges: The work included in this Item consists of cutting and removing the 10" DIP from the FDOT low level concrete bridges and includes but is not limited to cutting and disposing of pipe, anchors, straps, brackets, valves and other miscellaneous watermain material attached to the bridges. Payment will be made at the Contract Unit price per linear foot of 10" ductile Iron pipe removed, disposed of and accepted by Owner.
- Q. Item No. 17 – Abandon and Grout in Place 10" DIP Watermain: The work included in this Item consists of separating the existing 10" DIP watermain abandoned in place including, but not limited to excavation, backfill, compaction, isolation of piping to be abandoned, thrust restraint, evacuation and disposal of liquid from piping to be abandoned, grouting abandoned watermain with light weight concrete, capping ends of abandoned watermain, cleanup, restoration, coordination and all other work and materials required for complete abandonment of the 10" DIP watermain. Payment will be made at the Contract Unit price per linear foot of 10" ductile iron pipe watermain abandoned, grouted in place and accepted by Owner.
- R. Item No. 18 – Air Release Valve and Box: The work included in this Item consists of furnishing and installing easily accessible Air Release Valve (ARV) and fiberglass box in accordance with the plans including but not limited to the service saddle, corp. stop, HDPE or PVC and all other appurtenances necessary to provide a complete and operational ARV.

In addition, this Item shall also include the labor, materials, and equipment needed to install easily accessible sample points (in accordance with FDEP regulations) for the purpose of bacteriological sampling. Payment will be made at the Contract Unit price for each air release valve installed, complete and accepted by the Owner.

- S. Item No. 19 – Subaqueous Crossing Test Pit with ARV: The work included in this Item consists of furnishing and installing an easily accessible subaqueous crossing test pit with an air release valve and fiberglass box in accordance with the detail including but not limited to the service saddles, corp. stops, HDPE and all other appurtenances necessary to provide a complete and operational subaqueous crossing test pit with ARV. In addition, this Item shall also include the labor, materials, and equipment needed to install easily accessible sample points (in accordance with FDEP regulations) for the purpose of bacteriological sampling. Payment will be made at the Contract Unit price for each subaqueous crossing test pit with ARV installed, complete and accepted by the Owner.
- T. Item No. 20 – 2" Water Service: The work included in this Item consists of furnishing and installing a 2" water service from the watermain through the meter/backflow to the existing connection location including, but not limited to tapping saddle, corporation stop, 2" HDPE tubing or PVC pipe to extend to meter, curb stop, meter box, meter ball valve, meter adapters, backflow prevention device and certification, brass nipples, bushings, branches, Schedule 40 PVC to the existing connection, excavation, compaction, backfill, sprinkler system repairs, and surface restoration, resulting from water service installation, connection, testing, removal and disposal of existing water service materials, and other appurtenances required for a complete and operational installation. Payment will be made at the Contract Unit Price for each 2" water service installed, complete, and accepted by the Owner.
- U. Item No. 21 – Asphalt Driveway Repair: The work included in this Item consists of repairing an existing asphalt driveway cut as a result of abandoning the existing 10" DIP watermain and shall include, but not be limited to, saw cutting, removal, and disposal of the existing asphalt driveway material, excavation, preparation of subgrade, baserock, grading, compaction, prime coat, asphalt (Town pays for all passing density and asphalt tests, Contractor pays for failing tests), restoration and all other work and materials necessary for a complete asphalt repair. Payment will be made at the Contract Unit price per square yard of asphalt installed, complete, and accepted by the Owner.
- V. Item No. 22 – Required Restoration: The work included in this Item consists of all restoration work included in the project, including, but not limited to providing additional fill, removal and disposal of excess fill, grading, fine grading, sodding and watering, repair of irrigation systems, landscaping replacement, sidewalk repair / replacement and all other restoration as necessary to restore project areas to condition as existed prior to construction or better. Payment will be made at the Contract Lump Sum price for restoration based on the percentage completed, and accepted by the Owner. Final payment will not be made on this item until all newly installed sod is established and accepted by Owner.
- W. Item No. 23 – Electronic Record Drawings/GPS Data: The work included in this Item consists of the costs of preparing, submitting, and obtaining Owner approval of electronic as-built drawings, including GPS coordinates for all valves, fittings, meter boxes, fire hydrants, etc., and other data as may be required in the Contract Documents. Payment will be made on a lump sum basis based on the percentage of the item completed and accepted by Owner. Payment for this item will not be made until final record drawings (signed and sealed by a Florida registered surveyor) have been received and accepted by

Owner. Substantial completion on the Contract will not be granted or achieved until record drawings are submitted and accepted by the Owner. Failure to provide acceptable record drawings by the Contract Substantial Completion date will result in accumulating liquidated damages.

- X. Item No. 24 - Unidentified Utility Allowance: The work included in this Item is related to underground utility work not identified or reasonably anticipated through the Contract Documents. The amount for this item shall not exceed \$15,000. This is an allowance, and any work to be completed under this Item must be specifically approved in writing by the Owner, including the mutually agreed upon cost of said work. Any work completed by the Contractor without the Owner's prior written approval under this pay item will not be approved for payment.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01030

HURRICANE PREPAREDNESS

PART 1 -- GENERAL

1.01 HURRICANE PREPAREDNESS PLAN

- A. The Contractor's attention is drawn to the possibility of hurricane or severe storm conditions occurring at the site of work during the course of Contract Work.
- B. Within fourteen (14) days of the date of the Notice to Proceed, the Contractor shall submit to the Engineer and Owner a Hurricane Preparedness Plan. The plan should outline the necessary measures which the Contractor proposes to perform at no additional cost to the Owner in case of a hurricane or severe weather warning.
- C. In the event of inclement weather, or whenever the Owner shall direct, the Contractor shall, and will, cause Subcontractors to protect carefully the Work and all materials and equipment from experiencing damage or causing injury by extreme weather. Work and materials damaged shall be removed and replaced at the expense of the Contractor.
 - 1. Hurricane Watch: Upon designation of a hurricane watch, the Contractor shall be responsible for removing all loose supplies and equipment from the job site that may pose a danger. Contractor may provide the Owner with alternatives to removing the equipment and materials from the site, provided that the methods are reasonable considering the impending threat of storm. The Owner does not need to approve the alternative method should he feel it is not in the best interest of the Town. In addition, the Contractor shall remove all bulkheads and plugs in pipelines that would impede drainage in the case of flooding. Structures that may be in danger of floatation shall be flooded. The Contractor shall also cooperate with the Owner in protecting any other structures at the site from receiving poor quality runoff resulting from activities.
 - 2. Hurricane Warning: No mobile "temporary facility" shall be staffed during a hurricane warning. Contractor facilities meeting these criteria shall be evacuated. Reasonable steps shall be taken to protect all such facilities and their contents from damage and to avoid the facility from causing damage to the surroundings.
- D. The Contractor may be required to backfill excavations depending on the severity of the approaching storm or the expected amount of rainfall. Additionally, erosion protection and inlet protection will be required depending on the site conditions at the time of the Hurricane Watch.

E. Contractor shall be responsible to securely tie down large items and remove small lighter items from the job site upon notification to do so by the Owner. Equipment with booms or high rise pieces shall be lowered and secured.

- END OF SECTION -

SECTION 01200

PROJECT MEETINGS

PART 1 -- GENERAL

1.01 PRECONSTRUCTION

- A. A preconstruction meeting will be held to acquaint representatives of the Owner and various agencies with those in responsible charge of the Contractor's activities for the project. The meeting will cover such subjects as the following: insurance certificates; permits and licenses; construction schedules; cost breakdown and application for payments; material deliveries, storage and payments; shop drawings and submittals; job-site inspection by the Owner's representative; safety and emergency action procedures; field offices, security and other housekeeping procedures; and other appropriate matters.

1.02 PROGRESS

- A. Progress meetings shall be held on a weekly basis as required for the purpose of coordinating and expediting the Work. The Contractor's project manager and site superintendant, as a part of his obligations under the Contract, shall attend in person. Subcontractors shall attend as needed and requested by the Owner. The Owner will conduct such meetings and will issue meeting minutes to all attendees.
- B. In addition, the Owner or Contractor may call for special job site meetings for the purpose of resolving unforeseen problems or conflicts which may impede the construction schedule. The Owner will prepare a brief summary report of the decisions or understandings concerning each of the items discussed at the meeting. The Owner may request the attendance of subcontractors and Owner's consultants at these meetings.
- C. At weekly progress meetings, the Contractor shall submit to the Owner for review a current four week progress schedule. This schedule submission shall include a three week look ahead schedule and reflect the status of the Work performed during the preceding week.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01300

SUBMITTALS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. This Section specifies the means of all submittals. All submittals, whether their final destination is to the Owner, Engineer, or other representatives of the Owner, shall be directed through the Owner. A general summary of the types of submittals and the number of copies required is as follows:

<u>Copies to Engineer</u>	<u>Type of Submittal</u>
6	Construction schedule
4	Schedule of payment items
4	Schedule of submittals
4	Progress estimates
4	Shop drawings
4	Certificates of compliance
2	Warranties
2*	Product samples
2	O&M manuals
7**	Record drawings

* Unless otherwise required in the specific Section where requested.

** Four certified original blacklines; one set mylar and two CD's containing the record drawings in electronic/AutoCAD Release 2007 format and Adobe PDF.

1.02 SUBMITTAL PROCEDURES

- A. Transmit each submittal with a form acceptable to the Owner, clearly identifying the project, the submittal number, the Contractor, the items included in the submittal corresponding specification sections and drawing sheet numbers, and other pertinent information specified in other parts of this Section. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed Work.
- B. Revise and resubmit submittals as required. Identify all changes made since previous submittals. Resubmittals shall be noted as such.
- C. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.03 CONSTRUCTION SCHEDULE

- A. The Construction Schedule shall be prepared in the form of a horizontal bar chart showing in detail the proposed sequence of the Work and identifying construction activities for each major component, structure or facility. The schedule shall be time scaled, identifying the first day of each week, with the estimated date of starting and completion of each stage of the Work in order to complete the project within the Contract time. The schedule shall sufficiently detail and identify items such as Shop Drawings and tie-ins to existing watermain. Precedence activities shall be clearly identified to indicate an overall project critical path. The Contractor shall plan and allow for rain days / inclement weather in the Construction Schedule. No time extension or additional compensation will be given to the Contractor by the Owner for rain days or inclement weather.
- B. The Construction Schedule shall be revised to reflect comments by the Owner and Engineer and updated monthly, or as many times as the schedule changes depicting progress to the last day of the contract. Five (5) copies shall be distributed at the first construction meeting of each month or as many times as the schedule changes.
- C. Changes to the schedule shall be accompanied by a letter of explanation with appropriate reference and revision date on the schedule.
- D. Contractor is responsible for determining the sequence of activities, the time estimates of the detailed construction activities, and the means, methods, techniques, and procedures to be employed. The Construction Schedule shall represent the Contractor's best judgement of how he will prosecute the Work in compliance with the Contract requirements. Contractor shall ensure that the Construction Schedule is current and accurate and is properly and timely monitored, updated, and revised as project conditions and the Contract Documents may require. The Owner may require a certain order in which activities should be sequenced to accommodate maintaining water service to customers. In this case the Contractor shall determine the sequence of activities based upon the Owner's requirements.
- E. Contractor shall consult with his Subcontractors and Suppliers relating to the preparation of his construction plan and Construction Schedule. Subcontractors shall receive copies of those portions of Contractor's Construction Schedule which relate to their work and shall be continually advised of any updates or revisions to the Construction Schedule as the Work progresses.
- F. When Contractor submits his Construction Schedule to the Owner or makes any proposed updates or revisions to such Schedule, it will be assumed by the Owner that Contractor has consulted with and has the concurrence of his Subcontractors and Suppliers. Contractor shall be solely responsible for ensuring that all Subcontractors and Suppliers comply with the requirements of the Construction Schedule for their portions of the Work.
- G. Notwithstanding anything contained herein to the contrary, the Owner and Engineer shall not in any way be responsible for the Construction Schedule, nor the manner, means, timing, or sequencing of the Work and shall have no liability to Contractor, Owner, or any other party for same, as the Owner and Engineer have not participated in the generation of any Construction Schedule. Contractor hereby releases the Owner and Engineer from all such liability.

- H. The Construction Schedule shall be submitted by the Contractor in accordance with Section 01300 entitled "Submittals". The Contractor shall plan and allow for rain days / inclement weather in the Construction Schedule. No time extension or additional compensation will be given to the Contractor by the Owner for rain days or inclement weather.

1.04 SHOP DRAWINGS, PROJECT DATA AND SAMPLES

- A. General: A Shop Drawing Submittal Schedule shall be provided by the Contractor within ten (10) days of the Notice to Proceed.
- B. The Contractor shall furnish for review four (4) copies of Shop Drawings, project data, samples and other submittal items required by the Contract Documents. Owner will have fourteen (14) days to review and return shop Drawings to Contractor with approved and/or comments indicated in red. Two (2) copies shall be returned to the Contractor stamped "Furnish as Submitted" or "Furnish as Corrected". Where major corrections are indicated, two (2) copies will be returned stamped "Revise and Resubmit", and a new submittal is required (10 copies).
- C. The review of the Contractor's submissions shall in no way relieve the Contractor of any of his responsibilities under the Contract. An acceptance of a submission shall be interpreted to mean that there are no specific objections to the submitted material, subject to conformance with the Contract Drawings and Specifications.
- D. All submissions shall be dated and properly referenced to the Specifications Section and Contract Drawing number.
- E. Shop Drawings and Project Data within practical limits shall be submitted as a single complete package for any operating system and shall include all items of equipment and mechanical units involved in the functioning of such system. Where applicable, the submission shall include elementary wiring diagrams showing circuit functioning and necessary interconnection wiring diagrams for construction.
- F. All submissions shall bear the Contractor's stamp certifying that they have been checked for conformance and accuracy. Submissions without the Contractor's stamp of approval will not be reviewed by the Owner and will be returned to the Contractor.
- G. For any submission containing any departure from the Contract Documents, the Contractor shall include proper explanation in his letter of submittal.
- H. Work on fabricated or special items shall not commence until the required submission information has been reviewed and accepted.
- I. Standard items shall not be assembled or shipped until the required submission information has been reviewed and accepted.
- J. Prior review actions shall not relieve the Contractor of the responsibility of correcting errors, deviations, and/or omissions discovered at a later date.
- K. Shop Drawings: Shop Drawings include, but are not limited to, layout drawings, installation drawings, construction drawings, certified and interconnecting wiring

diagrams, etc. The Contractor shall be responsible for security of all the information, details, dimension, drawings, etc. necessary to prepare submission drawings required and necessary under this Contract and to fulfill all other requirements of his Contract. The Contractor shall secure such information, details, drawings, etc. from all possible sources including the Contract Drawings, drawings prepared by subcontractors, Owner, Engineer's, manufacturers, suppliers, etc.

- L. Submission drawings shall accurately and clearly present the following:
 - 1. All working and installation dimensions
 - 2. Arrangement and sectional views
 - 3. Units of equipment in the proposed position for installation, details of required attachments and connections, and dimensioned locations between units and in relation to the structures
 - 4. Necessary details and information for making connections between the various trades including but not limited to, power supplies and interconnection wiring between units, accessories, appurtenances, etc.
- M. Product Data: Where manufacturer's publications in the form of catalogs, brochures, illustrations, or other data sheets are submitted in lieu of prepared shop drawings, such submission shall specifically indicate the particular item offered. Identification of such items and relative pertinent information shall be made with indelible ink. Submissions showing only general information will not be accepted.
- N. Product data shall include materials of construction, dimensions, performance characteristics, capacities, wiring diagrams, piping and controls, etc.
- O. Samples: Contractor shall furnish for review all samples as required by the Contract Documents or requested by the Owner.
- P. Samples shall be of sufficient size or quantity to clearly illustrate the quality, type, range of color, finish, or texture and shall be properly labeled to show the nature of the Work where the material represented by the sample will be used.
- Q. Samples shall be checked by the Contractor for conformance to the Contract Documents before being submitted to the Owner and shall bear the Contractor's stamp certifying that they have been so checked. Transportation charges on samples submitted to the Owner shall be prepaid by the Contractor.
- R. Owner's review will be for compliance with the Contract Documents, and his comments will be transmitted to the Contractor with reasonable promptness.
- S. Accepted samples will establish the standards by which the completed Work will be judged.

1.05 RECORD DRAWINGS

- A. The Contractor shall keep and maintain, at the job site, one record set of Drawings. On these, it shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the original Contract Drawings, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities. Said record drawings shall be supplemented by detailed sketches as necessary or directed to fully indicate the Work as actually constructed. These master record drawings of the Contractor's representation of as-build conditions, including all revisions made necessary by addenda and change orders shall be maintained up-to-date during the progress of Work.
- B. Progress record drawings shall be received with each application for payment. Failure to maintain the record drawings up-to-date shall be grounds of withholding monthly progress payments until such time as the record drawings are brought up-to-date.
- C. Record drawings shall be accessible to the Owner at all times during the construction period.
- D. Final payment will not be acted upon until the final certified record drawings have been delivered to and accepted by the Owner. Final record drawings shall show as-built information overlain on design drawings including horizontal and vertical data and electronic GPS coordinate, as indicated in this specification. Where actual construction differs from design, designed components shall be hatched through indicating that they were not constructed in that location. Horizontal dimensions and vertical elevation shall be shown on the record drawings.
- E. Record Drawings must be submitted and accepted by the Owner before substantial completion can be achieved. Failure to provide acceptable drawings by the Contract Substantial Completion date will result in accumulating liquid damages.
- F. The complete set of Record Drawings finalized and submitted for Substantial Completion shall conform to the construction records of the Contractor. This set of Record Drawings shall consist of corrected drawings showing the reported location of the Work. The information submitted by the Contractor and incorporated into the Record Drawings will be assumed to be correct, and the Owner will not be responsible for the accuracy of such information, and for any errors or omissions which may appear on the Record Drawings as a result.
- G. Record Drawings must contain GPS coordinates per "Town of Jupiter Guide for Development, Design and Construction Standards".
- H. The information submitted by the Contractor in the record drawings shall be certified by a land surveyor registered in the State of Florida.
- I. The record drawings shall show the exact location of all structures and mains within the right-of-way or easement, size and type of material of mains, all deflection points (vertical and horizontal), top pipe elevations, stationing at 100-foot increments, and exact dimensions and locations of all fittings and valves.

1.06 WARRANTIES

- A. Original warranties, called for in the Contract Documents, shall be submitted to the Owner. When warranties are required, they shall be submitted prior to request for payment. The Contractor warrants the work performed under this contract for a period of one year from the date of final completion.
- B. When advance copies of warranties are requested, they shall be submitted with, and considered as, Shop Drawings.

1.07 CERTIFICATES

- A. Copies of certificates of compliance and test reports shall be submitted for requested items to the Owner prior to request for payment.

1.08 SCHEDULE OF PAYMENT VALUES

- A. The Contractor shall submit a separate Schedule of Payment Values for the Bid Package in accordance with Section 01025 entitled "Measurement and Payment" for all items in the proposal that are to be paid for on a lump sum basis. The schedule shall contain the installed value of the component parts of Work for the purpose of making progress payments during the construction period.
- B. The schedule shall be given in sufficient detail for the proper identification of the Work accomplished. Each item shall include its proportional share of all costs including the Contractor's overhead, contingencies, and profit. The sum of all scheduled items shall equal the total value of the Contract.
- C. For payments on acceptable stored material items, the Contractor shall also submit a separate list covering the cost of materials, delivered and unloaded with taxes paid, in accordance with Section 01025 entitled "Measurement and Payment". In addition, the listing shall also include the installed value of the item with coded reference to the Work items in the individual Schedule of Payment Values.
- D. The Contractor shall expand or modify the above schedule and materials listing as required by the Owner's initial or subsequent reviews.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01400

TESTING AND INSPECTION

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Owner will employ and pay for the services of an independent geotechnical testing laboratory for required testing as specified by the Owner. Contractor will be responsible to coordinate testing with laboratory and notify Owner a minimum of 24 hours before tests are scheduled to be conducted. Owner's representative must be present for all testing operations. Contractor will pay for failing tests. Owner will pay for passing tests. Contractor's failure to have Town representative present for testing will result in Contractor paying for that test and Owner may require re-test in his presence.
- B. The work or actions of the testing laboratory shall in no way relieve the Contractor of his obligations under the Contract. The laboratory testing work will include such inspections and testing required by the Contract Documents, existing laws, codes, ordinances, etc. The testing laboratory will have no authority to change the requirements of the Contract Documents, nor perform or approve any of the Contractor's Work.
- C. The Owner will bear the cost of all tests, inspections, or investigations undertaken for the purpose of determining conformance with the Contract Documents if such tests, inspections, or investigations are not specifically required by the Contract Documents and if conformance is ascertained thereby. Whenever nonconformance is determined by the Engineer or Owner as a result of such tests, inspections, or investigations, the Contractor shall bear the full cost thereof or shall reimburse the Owner for said cost. The cost of any additional tests and investigations, which are ordered by the Engineer or Owner to ascertain subsequent conformance with the Contract Documents, shall be borne by the Contractor.
- D. Any work requiring inspection or observation by the Owner shall be scheduled to occur between the hours of 7am to 4pm, Monday-Friday. No work shall be scheduled for weekends or Town observed holidays. Contractor will be responsible to pay for Town personnel overtime resulting from his work.
- E. See Section 15995, Pipeline Testing and Disinfection, for required waterline testing and inspections.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01500

CONSTRUCTION CONSIDERATIONS

PART 1 -- GENERAL

1.01 CUTTING AND PATCHING

- A. The Contractor shall perform all cutting and patching of his Work that may be required to make its several parts come together properly and fit it to receive or be received by such other work. The Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and shall only cut or alter work with the written consent of the Owner and of the other contractors whose work will be affected.

1.02 ABANDONMENT AND SALVAGE OF EXISTING FACILITIES

- A. General: The Scope of Work requires the Contractor to interface with existing piping which will be abandoned as part of the Work. Prior to beginning any Work associated with existing facilities to be abandoned, the Contractor shall inform the Owner of his intent so that all arrangements can be made with the Owner for isolating pipelines (where possible). The Contractor shall not proceed without written authorization from the Owner.
- B. Pipelines: The Contractor shall abandon, salvage, or otherwise remove existing pipelines or segments of existing pipelines shown to be abandoned in place, salvaged, or removed as part of the Contract Work. Unless otherwise indicated in the Contract Documents, all piping shown on the Drawings to be abandoned shall be abandoned in place, capped and filled with flowable fill. Abandon-in-place shall be defined as installing plugs or other permanent closure, as reviewed and accepted by the Owner, on all termination's, open ends, or ends of pipe designated as being cut, capped, and anchored in an acceptable manner. The pipe will remain buried unless otherwise noted.
- C. Piping indicated on the Drawings as being removed, or any piping to be abandoned which interferes with new structures or piping, shall be excavated and removed using methods which will not disturb adjacent piping or other facilities. All pipe materials shall be subject to salvage by the Owner as defined below. Any remaining piping on both ends of pipe segments removed shall be abandoned in place, per the above definition. After piping has been removed, the Contractor shall backfill the excavated area in accordance with requirements set forth in other Sections of these Specifications.

1.03 REHABILITATION

- A. Certain areas of existing structures, piping, conduits, and the like will be affected by Work necessary to complete modifications under this Contract. The Contractor shall be responsible to rehabilitate those areas affected by its construction activities.
- B. Where new piping is to be connected to existing piping, the existing piping shall be cut square, and the ends shall be properly prepared for the connection as shown on the Drawings. Any damage to the lining and coating of the existing piping shall be repaired by the Contractor.

- C. Disposal of Debris: All debris, materials, piping, and miscellaneous waste products from the Work described in this Section shall be removed from the project as soon as possible. They shall be disposed of in accordance with applicable federal, state, and local regulations. The Contractor is responsible for determining these regulations and shall bear all costs or retain any profit associated with disposal of these items.

1.04 INSTALLATION OF NEW PIPE

- A. Contractor shall have on hand sufficient personnel, proper equipment, and machinery of ample capacity to facilitate the Work.
- B. Contractor shall be responsible for locating, aligning and leveling new pipe and shall employ a licensed surveyor to set all lines and levels of equipment to the accuracy required.
- C. Complete manufacturer's installation instructions including permissible tolerances shall be furnished in duplicate with each component of the pipeline.
- D. The new pipeline shall be installed in accordance with the Shop Drawings; inclusive of manufacturer's specifications, drawings, and tolerances; and under the direct supervision of the required manufacturer's engineer. No instructions shall be issued that are contrary to written Specifications without prior written approval by the Owner's Engineer.

1.05 OBSTRUCTIONS

- A. All water pipes, storm drains, sanitary sewers, force mains, gas or other pipe, telephone or power cables, or conduits and all other obstructions, whether or not shown, shall be temporarily supported across utility line excavations. The Contractor shall be responsible for any damage to any such pipes, conduits, or structures. Approximate locations of known water, sanitary, drainage, power, and telephone installations along route of new pipelines or in the vicinity of new Work are shown, but must be verified in the field by the Contractor. The Contractor shall uncover these pipes, ducts, cables, etc., carefully, by hand, prior to installing new lines. Any discrepancies or differences found shall be brought to the attention of the Owner in order that necessary changes may be made to permit installation of new Work. These conditions are supplemental to general requirements elsewhere in the Contract Documents.

1.06 SITE CONDITIONS

- A. The Contractor acknowledges that he has investigated prior to bidding and satisfied himself as to the conditions affecting the Work, including but not restricted to those bearing upon transportation, disposal, handling, and storage of materials, availability of labor, water, electric power, roads, uncertainties of weather, canal stages, tides, water tables or similar physical conditions at the site, the conformation and conditions of the ground, and the character of equipment and facilities needed preliminary to and during prosecution of the Work. The Contractor further acknowledges that he has satisfied himself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, or any contiguous site, as well as from information presented

by the Drawings and Specifications made a part of this Contract, or any other information made available to him prior to receipt of Bids. Any failure by the Contractor to acquaint himself with the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the Work. The Owner assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the Owner.

1.07 DIFFERING SITE CONDITIONS

- A. The Contractor shall promptly and before such conditions are disturbed, notify the Owner in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in this contract, or (2) unknown physical conditions at the site of an unusual nature which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for this contract. The Owner will promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the Work under this contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the Contract modified in writing accordingly

1.08 PROTECTION OF PROPERTY

- A. The Contractor shall protect all property that may be affected by his Work or operations. The location and extent of underground and covered facilities are not guaranteed and the Contractor is cautioned to proceed with care in order to prevent the undermining or damage to existing structures, piping, or facilities.
- B. The Contractor shall take all measures necessary to protect new and existing mechanical equipment from dust and debris. All protective measures shall be furnished, installed, lighted, ventilated, maintained, and removed at the Contractor's cost.
- C. When Town water is being used, the supply source shall be protected against contamination in accordance with existing codes and regulations. Connection to Town water must be coordinated with Owner.
- D. In the event that any of the Contractor's activities disrupt or endanger any facilities, he shall at his own expense make all necessary repairs or replacements necessary to correct the situation to the satisfaction of the Owner. Such work shall progress continuously to completion on a 24 hours per day, 7 days per week basis. The Contractor shall be responsible for the services of repair crews on call 24 hours per day for emergencies that arise involving Work under this Contract.

1.09 WEATHER CONDITIONS

- A. Work that may be affected by inclement weather shall be suspended until proper conditions prevail. In the event of impending storms the Contractor shall take necessary precautions to protect all Work, materials, and equipment from exposure. The Owner reserves the right, to order that additional protective measures over and beyond those proposed by the Contractor, be taken to safeguard all components of the project. The Contractor shall not claim any compensation for such precautionary measures so ordered, nor claim any compensation from the Owner for damage to the Work from the elements of weather.

1.10 FIRE PROTECTION

- A. The Contractor shall take all necessary precautions to prevent fires at or adjacent to the Work, including his own buildings and trailers. Adequate fire extinguisher and hose line stations shall be provided throughout the work area.

1.11 SAFETY AND HEALTH REQUIREMENTS

- A. The Contractor shall comply in every respect with all Federal, State, and local safety and health regulations. Copies of the Federal Regulations may be obtained from the U.S. Department of Labor, Occupational Safety and Health Administration, 3200 East Oakland Park Boulevard, Room 204, Bridge Building, Fort Lauderdale, Florida 33300.
- B. The Contractor shall provide all barricades and flashing warning lights or other devices necessary to warn pedestrians and area traffic.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01510

UTILITIES AND SERVICES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall provide utilities and services for his own operations. These shall include electrical power, water, ventilation, sanitary facilities, and telephone service. The Contractor shall furnish, install, and maintain all temporary utilities during the contract period including removal upon completion of the Work. Such facilities shall comply with regulations and requirements of the National Electrical Code, OSHA, Florida Power and Light, and applicable Federal, State, and local codes, etc. In addition, the Contractor shall provide the utilities and services identified in Articles 1.02 through 1.08 of this Section.

1.02 TEMPORARY POWER

- A. The Contractor shall arrange with Florida Power and Light (FPL) for construction period service and pay all costs for the installation, equipment, and electrical power. The Contractor shall arrange and pay for a separate feeder to supply power from off-site directly from FPL service to the Contractor's temporary power system. In addition to providing for a safe construction period the Contractor shall provide safe and adequate artificial lighting system for work areas which do not have sufficient natural light. Temporary lighting shall be maintained during non-working periods if the area is subject to access by the public or other agency.

1.03 TEMPORARY WATER

- A. The Owner will make available water used for construction, flushing, and testing purposes. Water will be available from a hydrant located nearest to the vicinity of the work. The Contractor shall provide and maintain all piping, fittings, adapters, and valving required to convey water from the designated hydrant to the construction site. It is the Contractor's responsibility to **purchase** and obtain a temporary hydrant meter from the Jupiter Utilities Department. There will be no charge to the Contractor for water usage unless it is determined by the Owner that the Contractor is being wasteful with the water. Water service may not be readily available in this area, so the Contractor should plan accordingly.

1.04 TEMPORARY VENTILATION

- A. The Contractor shall provide and maintain adequate ventilation for a safe working environment. In addition, forced air ventilation shall be provided for the curing of installed materials, for humidity control, and for the prevention of hazardous accumulations of dust, gases, or vapors.

1.05 TEMPORARY SANITARY FACILITIES

- A. The Contractor shall provide and maintain adequate and clean sanitary facilities for the construction work force and visitors. The facilities shall comply with local codes and regulations and be situated at approved locations.

1.06 TEMPORARY TELEPHONE SERVICE

- A. The Contractor shall provide telephone services for his own operations or supply his project manager and site superintendent / foreman with a cellular phone. Contractor shall provide Owner with contact information of project manager and foreman.

1.07 SECURITY

- A. The Contractor shall care for and protect against loss or damage of all material to be incorporated in the construction including the existing structures, equipment, and materials for the duration of the Contract and shall repair or replace damaged or lost materials and damage to structures.

1.08 ACCESS TO THE SITE

- A. Access to the site which is required by the Contractor for his operations shall be obtained and maintained by the Contractor at his expense.
- B. Traffic routes between storage areas and construction sites shall be maintained in good condition, clear of all materials, equipment, excavated materials, etc., for the duration of the Contract.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01520

MAINTENANCE OF FACILITIES AND SEQUENCE OF CONSTRUCTION

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall coordinate his Work so as not to impact any nearby public or private facilities. In performing the Work shown and specified, the Contractor shall plan and schedule his Work as outlined in Article 1.07 of this Section entitled "General Sequence Of Construction And Operation".

1.02 CONSTRUCTION SCHEDULE

- A. The Construction Schedule shall be submitted by the Contractor in accordance with Section 01300 entitled "Submittals".

1.03 USE OF FACILITIES BEFORE COMPLETION

- A. The Owner reserves the right to enter and use any portion of the constructed facilities before final completion of the whole Work to be done under the Contract.

1.04 CONNECTION OF EXISTING SYSTEMS

- A. All connections to existing systems shall be performed in such a manner that no damage and minimal interruption is caused to the existing installation. Upon completion of the installation and approval from the Palm Beach County Health Department, the Contractor shall schedule with the Owner tying in the new watermain to existing watermain. Any damage caused to existing installations shall be repaired or replaced by the Contractor, in a manner approved by the Owner, and at no additional cost to the Owner.

1.05 COORDINATION WITH UTILITY PERSONNEL

- A. Before commencing Work involving the removal of existing facilities or placement in operation of new facilities or tie-ins to existing facilities, the Contractor shall notify the Owner at least 36 hours in advance. The Owner shall be responsible for manipulating existing valves and for removing facilities from operation.
- B. Only the Owner's appointed representative can authorize the shutdown of portions of the utility facilities (water system). The Contractor shall, under no circumstances, interfere with any water system component without the Owner's authorization, and supervision.

1.06 COORDINATION WITH PRIVATE PROPERTY OWNER

- A. Work is directly adjacent to private properties. The Contractor shall coordinate Work with the Owner and shall avoid any impact to the adjacent property owners.

1.07 GENERAL SEQUENCE OF CONSTRUCTION AND OPERATION

- A. Work under the Contract shall be scheduled and performed in such a manner as to result in the least possible disruption to the public's use of roadways, driveways, and utilities. Utilities shall include but not be limited to water, sewerage, drainage structures, electrical, cable, and telephone service. Prior to commencing with the Work, the Contractor shall perform a location investigation of existing underground utilities and facilities in accordance with Section 01530 entitled "Protection of Existing Facilities".
- B. The outlined sequence of construction does not include all items necessary to complete the Work, but is intended to identify the sequence of critical events necessary to minimize disruption to the function of affected facilities. It shall be understood by the Contractor that the critical events identified are not all inclusive and that additional items of Work not shown may be required. The sequence of construction is a precedence requirement and does not attempt to schedule the Contractor's Work. It is intended only to indicate which activities must precede other activities in order to minimize interferences and disruptions.
- C. At no time shall the Contractor undertake to close off any pipelines, manipulate valves, or take any other action which would affect the operation of the existing system, except as specifically required by the Drawings and Specifications, until authorization is granted by the Owner and after proper notification.
- D. Temporary installations required to complete a particular aspect of the Work during the allotted time period shall be determined and implemented by the Contractor at no additional cost to the Owner. All such temporary installations shall be subject to the review and acceptance of the Owner.
- E. Sequence of certain major events and identification of time constraints for removing piping and equipment from active service are as follows:
 - 1. Phase I - Mobilization:
 - a. Mobilize for work – set up staging area; develop and submit pollution prevention plan, dewatering disposal submittal, construction schedule and Shop Drawing Schedule; obtain permits; and begin submitting Shop Drawings (except those requiring verification of facilities - for those items verification should precede submittals).
 - b. If needed, the Contractor may use TOJ property along U.S. Hwy 1 just north of the south segment of HDD on the west side of U.S.1 for storage of equipment and material, specifically the area outside of the fence on the north side of the concrete pad. The Contractor must install a security fence (6' chain link) to keep the area safe and to keep pedestrians from entering the storage area. The property must be restored to existing or better condition upon project completion.
 - 2. Phase II - Site Preparation:
 - a. Verify locations of facilities, elevations, dimensions, type of joints, manufacturer of equipment, etc., before ordering materials to complete the Work in accordance with the Contract Documents and field conditions.

- b. Obtain equipment and materials to implement approved pollution prevention plan, approved dewatering disposal plan and meet all permitting requirements related to pollution prevention and testing/dewatering water containment and disposal.
- c. Order pipe, valves, fittings and other long lead items so that materials may be delivered in a timely fashion without delay to construction.
- d. Obtain equipment for the work and provide the Town of Jupiter with information on personnel which will monitor and address possible frac-out of drilling fluid from Horizontal Directional Drilling in accordance with the Contract Documents and permitting requirements of ACOE/FDEP. These include but are not limited to having on site or access to a vac-truck, barge, diver and Environmental Scientist.
- e. Meet all preconstruction permit requirements as noted in the FDOT, PBCHD and ACOE/FDEP regulatory agency permits listed in the Appendices.

3. Phase III – Construction:

- a. Once Phase I and II are complete, the Contractor may proceed with the underground work.
- b. Horizontal Directional Drilling may start under one or both segments of Lake Worth Creek.
- c. Restrain existing 10" DIP and install thrust blocks as noted on the Drawings. Valve insertions may be performed. Town of Jupiter personnel must be present during the insertion process and TOJ personnel only may operate the valve to isolate the system.
- d. Restrain existing 10" DIP and install thrust blocks as noted on the Drawings. Tapping saddle and valve installation may proceed. Town of Jupiter personnel must be present during the tapping process. Pressure tests shall be completed on the tapping saddle and valve prior to the actual tap.
- e. Underground watermain pipe and fitting installation may proceed.

4. Phase IV - Testing and Disinfection:

- a. Once the HDD pipe is in place and essential portions of the underground pipe have been installed, the Contractor may proceed with testing and disinfection. The sequence of testing and disinfection shall be full bore flushing, pigging, pressure testing, disinfection then bacteriological testing.
- b. The Contractor shall install temporary piping for full bore flushing and pigging. When flushing is complete, remove all temporary piping and proceed with permanent construction.

- c. Pressure tests shall be completed for the following components of the Work:
 - each tapping sleeve;
 - complete system from tapping valve on the south side of the south channel of Lake Worth Creek through to the gate valve on the north side of the south channel of lake Worth Creek.
 - complete system from tapping valve on the north side of the north channel of Lake Worth Creek through to the end of new installation on the south side of the north channel of Lake Worth Creek.
 - d. Subsequent to passing pressure tests, the Contractor may proceed to setup sampling points at locations noted on the plans and any other piping needed to accomplish disinfection and bacteriological sampling, disinfect the pipe(s) and proceed with bacteriological sampling.
 - e. The Contractor may work in multiple areas subject to the constraints of Paragraph 1.07F. Watermains must be released by the Palm Beach County Health Department before they can be placed into service.
5. Phase V – Placing Watermains and Water Services into Service:
- a. Restrain existing 10" DIP and install thrust blocks as noted on the drawings.
 - b. The Contractor may install the two 2-inch water services on the south side of the north section as noted on the drawings.
 - c. Coordinate with Town of Jupiter personnel to isolate portions of the transmission system for tie-in.
 - d. Perform a tie-in on only one section of the project at one time, either the north or south crossing. Once one section is installed, inspected, approved, and operational then the Contractor may work on the other section. Neither Burt Reynolds Park nor the PBC Chamber of Commerce may be out of water service at any time.
6. Phase VI – Abandonment and Removal of Existing 10" DIP:
- a. The Contractor may proceed to abandon and grout the 10" DIP watermain noted on the drawings.
 - b. The Contractor may proceed to remove and dispose of the buried 10" DIP watermain noted on the drawings.
 - c. The Contractor may proceed to remove and dispose of the 10" watermain attached to the bridge that is noted on the drawings.
7. Phase VII - Final Sitework and Closeout:

- a. Restoration, final grading, sodding, miscellaneous Work, demobilization and related closeout activities as described in Section 01700 entitled "Project Closeout" may proceed.
- F. Other Construction Constraints: The Contractor shall comply with the following constraints during construction and utilize these constraints in determining a sequence of construction:
 1. Contractor must perform the construction in accordance with the three permits issued for this work. Permits are provided in the appendices and listed below:
 - a. Army Corp. of Engineers / Florida Department of Environmental Protection Environmental Resource Permit No. 50-0163498-001
 - b. Palm Bch. County Health Department Watermain Construction Permit No. 138279-274-DSGP
 - c. State of Florida Department of Transportation Utility Permit No. 2010-H-496-0009-9304C
 2. A pre-construction video of the areas to be affected by construction and adjacent surrounding areas must be provided to and accepted by the Owner prior to mobilization.
 3. Limit the stringing of pipe to no more than one (1) week in advance of installation. Pipe laid out in advance of the installation shall not restrict pedestrian or vehicular traffic or block driveways.
 4. All drives and approaches shall be restored to a useable condition at the end of each work day.
 5. Excavations in residential areas shall be backfilled, and temporary restoration shall be completed at the end of each work week. No open holes will be allowed over the weekend or holidays. All excavation shall be secured at the end of each work day to prohibit public access.
 6. Final restoration of roads, driveways, sidewalks, and all other paved areas shall be complete within 14 days of passing hydrostatic pipe tests for each segment tested.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION

3.01 COORDINATION WITH EXISTING UTILITIES AND OTHER AGENCIES

- A. The Contractor shall notify all utilities including Loxahatchee River District (LRD), FPL, Bell South, cable, etc. in writing, with a copy to the Owner, before construction is started and shall coordinate its activities with them. The Contractor shall cooperate with the owner's of utilities that may require temporary interruption of service in order to minimize the interruption. The Contractor shall call Sunshine One-Call Notification at 1-800-432-4770 a minimum of 48 hours prior to any excavation for location of existing underground facilities.

3.02 COOPERATION

- A. The Contractor shall allow representatives from the permitting agencies, Owner or their agents to enter the facilities being constructed under this Contract for the purpose of inspecting, constructing, installing, operating, maintaining, removing, repairing, altering, or replacing such equipment pipes, sewers, conduits, manholes, wires, or other structures and appliances which may be required to be installed at or in the Work. The Contractor shall cooperate with all of the aforesaid parties and shall allow reasonable provisions for the prosecution of any other work by the Owner, or others, to be done in connection with his Work or in connection with normal use of the facilities.

- END OF SECTION -.

SECTION 01530

PROTECTION OF EXISTING FACILITIES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this Contract. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.
- B. Contractor shall comply promptly with such safety regulations as may be prescribed by the Owner or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of, his employees. In the event of the Contractor's failure to comply, the Owner may take the necessary measures to correct the conditions or practices complained of, and all costs thereof will be deducted from any monies due the Contractor. Failure of the Engineer to direct the correction of unsafe conditions or practices shall not relieve the Contractor of his responsibility hereunder.
- C. In the event of any claims for damage or alleged damage to property as a result of work under this Contract, the Contractor shall be responsible for all costs in connection with the settlement of or defense against such claims. Prior to commencement of work in the vicinity of property adjacent to the work site, the Contractor, at his own expense, shall take such surveys as may be necessary to establish the existing condition of the property. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

1.02 PROTECTION OF WORK AND MATERIAL

- A. During the progress of the work and up to the date of final payment, the Contractor shall be solely responsible for the care and protection of all work and materials covered by the Contract.
- B. All work and materials shall be protected against damage, injury or loss from any cause whatsoever, and the Contractor shall make good any such damage or loss at his own expense. Protection measures shall be subject to the approval of the Owner.

1.03 BARRICADES, WARNING SIGNS AND LIGHTS

- A. Each Contractor shall provide and maintain such other warning signs and barricades in areas of and around their respective work as may be required for the safety of all those employed in the work, the Owner's operating personnel, or those visiting the site.

1.04 EXISTING UTILITIES AND STRUCTURES

- A. The term existing utilities shall be deemed to refer to both publicly-owned and privately-owned utilities such as electric power and lighting, telephone, water, gas, storm drains, process lines, sanitary sewers and all appurtenant structures.
- B. Where existing utilities and structures are indicated on the Drawings, it shall be understood that all of the existing utilities and structures affecting the work may not be shown and that the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.
- C. Prior to beginning any excavation work, the Contractor shall, through field investigations, determine any conflicts or interferences between existing utilities and new utilities to be constructed under this project. This determination shall be based on the actual locations, elevations, slopes, etc., of existing utilities as determined in the field investigations, and locations, elevation, slope, etc. of new utilities as shown on the Drawings. If an interference exists, the Contractor shall bring it to the attention of the Owner as soon as possible. If the Owner agrees that an interference exists, he shall modify the design as required. Additional costs to the Contractor for this change shall be processed through a Change Order as detailed elsewhere in these Contract Documents. In the event the Contractor fails to bring a potential conflict or interference to the attention of the Owner prior to beginning excavation work, any actual conflict or interference which does arise during the Project shall be corrected by the Contractor, as directed by the Owner, at no additional expense to the Owner.
- D. The work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Temporary connections shall be provided, as required, to insure there is no interruption of existing services. Any damage resulting from the work of this Contract shall be promptly repaired by the Contractor at his own expense in a manner approved by the Owner and further subject to the requirements of any authority having jurisdiction. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all costs thereof.
- E. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the Contractor. All such work shall be performed in a manner satisfactory to the Engineer and the respective authority having jurisdiction over such work. In the event the Contractor fails to provide proper support or protection to any existing utility, the Engineer may, at his discretion, have the respective authority to provide such support or protection as may be necessary to insure the safety of such utility, and the costs of such measures shall be paid by the Contractor.

PART 2 -- PRODUCTS - (NOT USED)

PART 3 -- EXECUTION - (NOT USED)

- END OF SECTION -

SECTION 01550

SITE ACCESS AND STORAGE

PART 1 -- GENERAL

1.01 SITE ACCESS

- A. The Contractor shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the Work. It shall be the Contractor's responsibility to construct and maintain any haul roads required for its construction operations.

1.02 TEMPORARY CROSSINGS

- A. Street Use: Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street, alleyway, or parking area during the performance of Work hereunder, and it shall so conduct its operations as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleys, ways, or parking areas. No street shall be closed to the public without first obtaining permission of the Owner and proper governmental authority. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise provided or shown. Toe boards shall be provided to retain excavated material if required by the Owner or the agency having jurisdiction over the street or highway. Fire hydrants on or adjacent to the Work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the Contractor to assure the use of sidewalks and the proper functioning of all gutters, sewer inlets, and other drainage facilities.
- B. Traffic Control: For the protection of traffic in public or private streets and ways, the Contractor shall provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights, and other safety devices in accordance with the requirements of the latest edition of Florida Department of Transportation Index 600 and "Manual of Uniform Traffic Control Devices, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations," published by U.S. Department of Transportation, Federal Highway Administration (ANSI D6.1).
- C. The Contractor shall take all necessary precautions for the protection of the Work and the safety of the public. All barricades and obstructions shall be illuminated at night, and all lights shall be kept burning from sunset until sunrise. The Contractor shall station such guards or flaggers and shall conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions. All signs, signals, and barricades shall conform to the requirements of the latest edition of Florida Department of Transportation Index 600 and Subpart G, Part 1926, of the OSHA Safety and Health Standards for Construction.
- D. The Contractor shall remove traffic control devices when no longer needed, repair all damage caused by installation of the devices, and shall remove post settings and backfill the resulting holes to match grade.

- E. Temporary Street Closure: If the closure of any street is required during construction, a formal application for a street closure shall be made to the authority having jurisdiction at least 30 days prior to the required street closure in order to determine necessary sign and detour requirements. Additionally it shall be the Contractor's responsibility to notify Palm Beach County School Board, local solid waste authority, TOJ Police Department, and the Palm Beach County Fire Department a minimum of 48 hours prior to closure.
- F. Temporary Driveway Closure: The Contractor shall notify the owner or occupant (if not owner-occupied) of the closure of the driveways to be closed more than one 8-hour work day, at least three (3) working days prior to the closure. The Contractor shall minimize the inconvenience and the time period that the driveways will be closed. The Contractor shall fully explain to the owner/occupant how long the Work will take and when closure is to start.

1.03 CONTRACTOR'S WORK AND STORAGE AREA

- A. Responsibility for protection and safekeeping of equipment and materials at or near the site will be solely that of the Contractor, and no claim shall be made against the Owner by reasons of any act of an employee or trespasser. Should an occasion arise necessitating access to an area occupied by stored equipment and/or materials, the Contractor shall immediately move them.
- B. Contractor shall coordinate with the Owner for the proper storage area location.
- C. The Contractor may use TOJ property along U.S. Hwy 1 just north of the south segment of HDD on the west side of U.S.1 for storage of equipment and material. There is an area outside the fence on the north side of the concrete pad. The Contractor must install a security fence (6' chain link) to keep the site safe and to keep pedestrians from entering the storage area. The property must be restored to existing or better condition upon project completion.
- D. Upon completion of the Contract, the Contractor shall remove from the storage areas all of its equipment, temporary fencing, surplus materials, rubbish, etc., and restore the areas as specified.

PART 2 – PRODUCTS - (Not Used)

PART 3 – EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01560

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Dust Control

1. Contractor shall take all necessary measures to control dust from his operations, and to prevent spillage of excavated materials on public roads.
2. Contractor shall remove all spillage of excavated materials, debris or dust from public roads by methods approved by the Owner.
3. Contractor shall sprinkle water at locations and in such quantities and at such frequencies as may be required by the Owner to control dust and prevent it from becoming a nuisance to the surrounding area.
4. Dust control and cleaning measures shall be provided at no additional cost to the Owner.

B. Pollution Prevention Plan

1. Contractor shall prepare a Stormwater Pollution Prevention Plan for submittal and approval of the Owner.

C. Noise Control

1. Contractor shall provide acoustical barriers so noise emanating from tools or equipment will not exceed legal noise levels.
2. Contractor shall propose a plan to mitigate construction noise and to comply with noise control ordinances including method of construction, equipment to be used, and acoustical treatments.
3. Noise shall not exceed 55 dBS at the property line at anytime.

D. Dewatering

1. Contractor shall submit his dewatering process methods in accordance with paragraph 3.03D in Section 02222 EXCAVATION AND BACKFILL FOR UTILITIES, and apply for any necessary dewatering permits.
2. Contractor shall be responsible for dewatering. Proposed dewatering activities shall be less than 90 days with maximum daily pumpage of less than 5 million gallons per day and maximum total project pumpage of less than 100 million gallons.

3. Contractor shall provide silt control/PPP items to retain silt and control all dewatering discharge onsite. Direct discharge into Intracoastal Waterway or other off-site discharge is not acceptable.
4. Contractor shall meet all requirements as required by Florida Administrative Code, South Florida Water Management District and any other agencies having jurisdiction.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01570

TRAFFIC REGULATIONS AND MAINTENANCE OF TRAFFIC

PART 1 -- GENERAL

1.01 TRAFFIC CONTROL

- A. The Contractor shall obey all traffic laws and comply with all the requirements, rules, and regulations of the Florida Department of Transportation, Palm Beach County, and other local authorities having jurisdiction, to maintain adequate warning signs, lights, barriers, etc., for the protection of vehicular, bicycle and pedestrian traffic in public Rights of Way in the project areas.
- B. All traffic control devices, warning devices, safety devices and barriers shall meet the requirements of National Cooperative Highway Research Report 350 (NCHRP 350), current Manual of Uniform Traffic Control Devices and any current FHWA directives.
- C. The Contractor shall develop, or have developed, a Traffic Control Plan and submit to the Engineer or Owner for approval. The Traffic Control Plan shall meet the requirements of Index 600 of the latest edition of the Florida Department of Transportation Design Standards. The Traffic Control Plan shall be on 11"x17" plan sheets and have separate sheets for each phase of construction (if applicable). The Contractor shall take responsibility for identifying and assessing any potential impacts to any utilities that may be caused by the Traffic Control Plan; the Contractor shall be responsible for notifying the Town of Jupiter in writing if any such potential impacts to utilities.
- D. The Contractor shall maintain traffic and protect the public from all damage to persons and property within the Contract Limits, in accordance with the Contract Documents and all applicable state, county, and local regulations. The Contractor shall install and maintain adequate traffic control devices, warning devices and barriers to protect the traveling public and workers, and to safeguard the work area. Erect the required traffic control devices, warning devices and barriers to prevent any hazardous conditions and in conjunction with any necessary traffic re-routing. Use only those devices that are included in 600 series in the latest edition of the Design Standards of Florida Department of Transportation. He shall conduct his operations so as to maintain and protect access for vehicular and pedestrian traffic, to and from all properties and business establishments adjoining or adjacent to those streets affected by his operations, and to subject the public to a minimum of delay and inconvenience. Suitable signs, barricades, railing, etc., shall be erected and the work outlined by adequate lighting at night. Danger lights shall be provided as required. Watchmen and flagmen shall be provided as may be necessary for the protection of traffic.
- E. The Contractor shall notify the Engineer or Owner of any scheduled operation, which will affect traffic patterns or safety, sufficiently in advance of commencing such operation to permit his review of the plan for the proposed installation of traffic control devices, warning devices or barriers.

- F. The Contractor shall have an employee assigned the responsibility of maintaining the position and condition of all traffic control devices, warning devices and barriers throughout the duration of the Contract. The Contractor shall keep the Engineer or Owner advised at all times of the identification and means of contacting this employee on a 24-hour basis.
- G. The Contractor shall keep control devices, warning devices, safety devices and barriers in the correct position, properly directed, clearly visible and clean, at all times. Immediately repair, replace or clean damaged, defaced or dirty devices or barriers.
- H. The Contractor shall be responsible for enforcing on-site parking regulations. The Contractor and his personnel are cautioned against parking vehicles in business zones for extended periods of time. If necessary, the Contractor shall obtain off-site parking areas for his personnel.
- I. All dirt spilled from the Contractor's trucks onto existing pavements shall be removed by the Contractor whenever, in the opinion of the Owner, the accumulation is sufficient to cause the formation of mud, dust, or interference with traffic or create a traffic hazard.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01600

EQUIPMENT AND MATERIALS

PART 1 -- GENERAL

1.01 GENERAL

- A. All equipment, materials, instruments, or devices incorporated in this project shall be new and unused, unless indicated otherwise in the Contract Documents.
- B. Equipment and materials to be incorporated in the Work shall be delivered sufficiently in advance of their installation and use to prevent delay in the execution of the Work, and they shall be delivered as nearly as feasible in the order required for executing the Work.
- C. The Contractor shall protect all equipment and materials from deterioration and damage. The equipment and materials shall be handled and stored by the manufacturer, fabricator supplier, and Contractor before, during, and after shipment to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, damage or theft of any kind whatsoever. Any equipment exhibiting any of the above shall be removed and replaced at the Contractor's expense for both labor and materials.

1.02 STORAGE

- A. The Contractor shall store his equipment and materials at the jobsite in accordance with the manufacturer's recommendations and as directed by the Owner. He shall not store unnecessary materials or equipment on the jobsite and shall prevent any structure from being overloaded and endangering the safety of his personnel. The Contractor shall enforce the instructions of the Owner and the Engineer regarding the posting of regulatory signs for loadings on structures, fire safety, and smoking areas.

1.03 HANDLING AND MAINTENANCE

- A. The manufacturer's storage instructions shall be carefully followed and any deviations shall be approved by the manufacturer in writing with a copy to the Owner. Equipment with moving parts shall be rotated per the manufacturer's recommendations while in storage and during the period between installation and acceptance.
- B. All equipment shall be stored fully lubricated unless otherwise instructed by the manufacturer. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment at the time of acceptance.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 01700

PROJECT CLOSEOUT

PART 1 -- GENERAL

1.01 PROJECT CLOSEOUT

- A. As construction of the project enters the final stages of completion, the Contractor shall, in accordance with the requirements set forth in the Contract Documents, attend to or have already completed the following items:
1. Schedule tie-ins and placement of new watermain into service.
 2. Correct or replace defective work, including completion of items previously overlooked or work which remains incomplete, all as evidenced by the Owner's "Punch" lists.
 3. Make final submittals including certified record drawings.
 4. Attend to any other items listed herein or brought to the Contractor's attention by the Owner.

1.02 FINAL SUBMITTALS

- A. Prior to the final acceptance of the project, the Contractor shall submit to the Owner certain records, certifications, etc., which are specified elsewhere in the Contract Documents. Missing, incomplete, or unacceptable items, as determined by the Owner, shall constitute grounds for withholding final payment to the Contractor. A partial list of such items appears below, but it shall be the Contractor's responsibility to submit any other items which are required in the Contract Documents:
1. Written Test results of project components
 2. During the entire construction operation, the Contractor shall maintain records of all deviations from the Drawings and Specifications and shall prepare therefrom record drawings showing correctly and accurately all changes and deviations from the Work made during construction to reflect the Work as it was actually constructed. These record drawings shall conform to recognized standards of drafting and shall be neat, legible, and on Mylar, blackline, and electronic AutoCAD Release No. 2007 and PDF.
 3. Written guarantees, where required
 4. Certificates of inspection and acceptance by local governing agencies having jurisdiction
 5. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law

1.03 PUNCH LISTS

- A. Final cleaning and repairing shall be scheduled upon completion of the project.
- B. The Owner will make his substantial completion inspection whenever the Contractor has notified the Owner in writing that the Work is ready for substantial completion. Any Work not found acceptable and requiring cleaning, repair, and/or replacement will be noted on the "Punch" list. Work that has been inspected and accepted by the Owner shall be maintained by the Contractor until final acceptance of the entire project.
- C. Whenever the Contractor has completed the items on the "Punch" list, he shall again notify the Owner in writing that the work is ready for final inspection. This procedure will continue until the entire project is accepted by the Owner. The "Final Payment" will not be processed until the entire project has been accepted by the Owner and all of the requirements in Article 1.03 of this Section entitled "Final Submittals" have been satisfied.

1.04 MAINTENANCE AND GUARANTEE

- A. The Contractor shall comply with all maintenance and guarantee requirements of the Contract Documents.
- B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing constructed by the Contractor which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless the Contractor has obtained a statement in writing from the affected private owner or public agency relieving the Owner of further responsibility in connection with such repair or resurfacing.
- C. The Contractor shall make all repairs and replacements promptly upon notification by the Owner. If the Contractor fails to make such repairs or replacements promptly, the Owner reserves the right to do the Work and the Contractor and his surety shall be liable to the Owner for the cost thereof.

1.05 FINAL CLEANUP

- A. The Contractor shall promptly remove from the vicinity of the completed Work, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the Work by the Owner will be withheld until the Contractor has satisfactorily complied with the foregoing requirements for final cleanup of the project site.

PART 2 -- PRODUCTS - (Not Used)

PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

SECTION 02110

CLEARING AND GRUBBING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. Clear and grub the areas to be occupied by the proposed water transmission system including all areas to be excavated, filled, paved, or planted as shown on the Drawings, and remove and/or dispose of material and debris resulting from these operations as specified herein.
- B. Unless otherwise shown on the Drawings, clearing and grubbing shall be done within the rights-of-way.

PART 2 -- PRODUCTS (Not Used)

PART 3 -- EXECUTION

3.01 CLEARING

- A. The surface of the ground, for the area to be cleared and grubbed shall be completely cleared of all timber, brush, stumps, roots, grass, weeds, rubbish and all other objectionable obstructions resting on or protruding through the surface of the ground. However, those trees which are designated by the Owner shall be preserved as hereinafter specified. Clearing operations shall be conducted so as to prevent damage to existing facilities.
- B. For selective clearing, the Owner shall select and mark, or otherwise designate, the trees or other vegetation to be removed.

3.02 GRUBBING

- A. Grubbing shall consist of the complete removal of all stumps, roots larger than 1.5 inches in diameter, matted roots, brush, timber, logs and any other organic or metallic debris resting on, under or protruding through the surface of the ground to a depth of 18 inches below the subgrade. All depressions excavated below the original ground surface for or by the removal of such objects, shall be refilled with suitable materials and compacted to a density conforming to the surrounding ground surface.

3.03 DISPOSAL OF CLEARED AND GRUBBED MATERIAL

- A. The Contractor shall dispose of all material and debris from the clearing and grubbing operations by delivering to an appropriately permitted landfill.
- B. Deep burial and burning of any material shall not be permitted. In no case shall debris from the clearing and grubbing operations remain on site. The cost of disposal of material

(including hauling) shall be considered a subsidiary obligation of the Contractor, the cost of which shall be included in the Contract price.

3.04 PROTECTION OF ADJACENT AREAS

- A. The Contractor shall protect areas shown on the Drawings or designated by the Owner to remain protected from damage by construction operations by erecting suitable barriers or other acceptable means. Areas outside the limits of construction as shown on the Drawings shall be protected and no equipment or materials shall be stored or allowed to damage these areas.

- END OF SECTION -

SECTION 02222

EXCAVATION AND BACKFILL FOR UTILITIES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. Excavate, grade and backfill as required for the site underground piping systems, and electrical and instrumentation duct banks and conduit as shown on the Drawings and specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02110 - Clearing and Grubbing
- B. Section 15000 - Piping, General

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Commercial Standards:

ASTM D422	Method for Particle-Size Analysis of Soils.
ASTM D698	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb (2.49-kg) Rammer and 12-in (304.8-mm) Drop.
ASTM D1556	Test Method for Density of Soil in Place by the Sand-Cone Method.
ASTM D1557	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in (457-mm) Drop.
ASTM D2419	Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
ASTM D2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.04 SUBMITTALS

- A. The Contractor shall submit information and samples to the Owner for review as specified herein in accordance with the Section 01300 - Submittals.
- B. The Contractor shall submit to the Owner his proposed methods of handling trench water and the locations at which the water will be disposed of. Methods shall be acceptable to the Owner before starting the excavation.

- C. The Contractor shall notify the Owner of the off-site sources of bedding and backfill materials, and submit to the Owner a representative sample weighing approximately 25 lbs.
- D. Drawings of any proposed sheeting system and design computations shall be submitted to the Owner; however, the review of these Drawings shall in no way relieve the Contractor of the responsibility to provide a safe and satisfactory sheeting and shoring system. Sheeting and shoring shall be designed by the Contractor, and the proposed design shall be sealed by a Professional Engineer registered in the State of Florida. If the Owner is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports put in at the Contractor's expense.
- E. Dewatering
 - 1. The Contractor shall submit his proposed methods of handling trench water and the locations at which the water will be disposed of. Methods shall be acceptable to the Owner and Engineer before starting and excavating and necessary permits for dewatering must be obtained by the Contractor.
- F. Bedding and Backfill Materials
 - 1. The Contractor shall notify the Owner of the off-site sources of bedding and backfill materials and submit to the Owner a representative sample weighing approximately 25 lbs.
- G. Sheeting System: Drawings if any proposed sheeting system and design computations shall be submitted to the Engineer; however, the review of these Drawings shall in no way relieve the Contractor of the responsibility to provide a safe and satisfactory sheeting and shoring system. Sheeting and shoring shall be designed by the Contractor, and the proposed design shall be sealed by a Professional Engineer registered in the State of Florida. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports put in at the Contractor's expense.

1.05 QUALITY CONTROL

- A. An independent testing laboratory will be retained by the Owner to provide appropriate testing as described in Section 01400 - Quality Control. The Contractor shall schedule his Work so as to permit a reasonable time for testing before placing succeeding lifts and shall keep the laboratory informed of his progress.

1.06 GROUNDWATER

- A. The Contractor shall be responsible for anticipating groundwater conditions and shall provide positive control measures as required. Such measures shall ensure stability of excavations, groundwater pressure control, prevention of tanks, pipes, and other structures from being lifted by hydrostatic pressures, and avoiding the disturbance of subgrade bearing materials.
- B. All dewatering work performed under this Contract shall be done in conformance with the subject to the limitations and regulations of the SFWMD.

1.07 TRENCH SAFETY ACT COMPLIANCE

- A. The Contractor by signing and executing the contract is, in writing, assuring that he will perform any trench excavation in accordance with the Florida Trench Safety Act, Section 553.60 et. seq.. The Contractor further identified the separate item(s) of cost of compliance with the applicable trench safety standards as well as the method of compliance as noted in the Contract front-end documents.

The Contractor acknowledges that this cost is included in the applicable items of the Proposal and Contract and in the Base Bid Price.

- B. The Contractor is, and the Owner and Engineer are not, responsible to review or assess the Contractor's 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 et. seq. cited as the "Trench Safety Act". The Contractor is, and the Owner 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".

1.08 PROTECTION OF PROPERTY AND STRUCTURES

- A. The Contractor shall, at his own expense, sustain in place and protect from direct or indirect injury, all pipes, poles, conduits, walls, buildings, and all other structures, utilities, and property in the vicinity of his work. The Contractor shall take all risks attending the presence or proximity of pipes, poles, conduits, walls, buildings, and all other structures, utilities, and property in the vicinity of his work. He shall be responsible for all damage, and assume all expenses, for direct or indirect injury and damage, caused by his work, to any such pipe, structures, etc., or to any person or property, by reason of injury to them, whether or not such structures, etc., are shown on the Drawings.
- B. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrian and vehicular traffic of such excavations. Barricades with flashing lights shall also be placed along excavation from sunset each day to sunrise of the next day until such excavation is entirely refilled, compacted, and paved. All excavations shall be barricaded where required to meet OSHA, local and Federal Code requirements, in such a manner to prevent persons from falling or walking into any excavation.

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Materials shall be furnished as required from on-site excavations or from acceptable off-site sources as required. The Contractor shall notify the Owner of the sources of each material at least ten calendar days prior to the anticipated use of the materials.
- B. In general, clean sandy excavated materials, that are free from organics, clay and construction debris, can be used as pipe bedding when construction is in a dry condition and when the bedding is not sided by muck. Pipe bedding material shall be able to pass through a 3/4-inch sieve. Separation of suitable material for pipe bedding from other material shall be made during the excavation.
- C. Screened gravel shall be used for small diameter (less than 24") and plastic pipe bedding when either the trench is within the water table or when the bedding is sided by muck or muck-like material. Screened gravel shall consist of hard, durable particles of proper size and gradation, and shall be free from organic material, wood, trash, sand, loam, clay, excess fines, and other deleterious materials. The gravel shall be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
1 inch	100
3/4 inch	99
1/2 inch	65
No. 4	2

- D. Sand for bedding polyvinyl chloride pipe shall be a dry screened sand. Sand shall be graded sand with 100 percent passing a 3/8 inch sieve and not more than 5 percent passing a No. 200 sieve.
- E. In general, clean sandy excavated material, that is free from organics clay and construction debris can be used for backfill material. All material to be used as selected backfill shall be able to pass a 3/4-inch sieve. If, in the Owner's opinion, excavation material is unsuitable for backfill purposes, imported material having a sand equivalent value of not less than 20 percent shall be used for this portion of the trench backfill. All backfill material (placed above select backfill) shall be able to pass through a 6-inch ring. If suitable backfill is not available from the excavations, it shall be obtained from off site sources.

PART 3 -- EXECUTION

3.01 EXCAVATION

- A. The Contractor shall perform all excavation of every description and of whatever substance encountered, to the dimensions, grades and depths shown on the Drawings, or as directed. All excavations shall be made by open cut. All existing utilities such as pipes, poles and

structures shall be carefully located, supported and protected from injury; in case of damage, they shall be restored at the Contractor's expense.

- B. Pipe trenches for piping shall be excavated to a width within the limits of the top of the pipe and the trench bottom so as to provide a clearance on each side of the pipe barrel, measured to the face of the excavation, or sheeting if used, of 8 inches to 12 inches. Where the pipe size exceeds 12 inches, the clearance shall be from 12 inches to 18 inches. All pipe trenches shall be excavated to a level where suitable material is reached, a minimum of 8 inches below the excavated depth that will allow for a minimum of 36" of covering unless otherwise indicated on the Drawings. Excavation depths in other types of materials and conditions shall be made as hereinafter specified.
- C. In areas where trench widths are not limited by right-of-way and/or easement widths, property line restrictions, existing adjacent improvements, including pavements, structures and other utilities, and maintenance of traffic, the trench sides may be sloped to a stable angle of repose of the excavated material but only from a point one foot above the crown of the pipe. A substantially and safely constructed movable shield, "trench box" or "mule" may be used in place of sheeting when the trench is opened immediately ahead of the shield and closed immediately behind the shield as pipe laying proceeds inside the shield.
- D. Ladders or steps shall be provided for and used by workmen to enter and leave trenches.
- E. Excavation for appurtenances shall be sufficient to provide a clearance between their outer surfaces and the face of the excavation or sheeting, if used, of not less than 12 inches.
- F. Excavated unsuitable material shall be removed from the site and disposed of by the Contractor. Materials removed from the trenches shall be stored in such a manner that will not interfere unduly with plant operations, traffic on public roadways and sidewalks and shall not be placed on private property. In congested areas, such materials as cannot be stored adjacent to the trench or used immediately as backfill shall be removed to other convenient places of storage acceptable to the Owner at the Contractor's expense.
- G. Excavated material that is suitable for use as backfill shall be used in areas where sufficient material is not available from the excavation. All excess excavated suitable material shall be the property of the Owner and shall be delivered to a designated location within a ten mile one way travel distance from the site.

3.02 SHEETING AND BRACING

- A. The Contractor shall furnish, place and maintain sheeting and bracing to support sides of the excavation as necessary to provide safe working conditions in accordance with OSHA requirements, and to protect pipes, structures and other Work from possible damage. Where wood sheeting or certain designs of steel sheeting are used, the sheeting shall be cut off at a level of 2 feet above the top of the installed pipe and that portion below the level shall be left in place. If interlocking steel sheeting is used, it may be removed providing removal can be accomplished without disturbing the bedding, pipe or alignment of the pipe. Any damage to the pipe bedding, pipe or alignment of the constructed utility caused by the removal of sheeting shall be cause for rejection of the affected portion of the work. The Owner may permit sheeting to be left in place at the request and expense of the Contractor.

- B. If the Owner is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports put in at the Contractor's expense. The Contractor shall be responsible for the adequacy of all sheeting used and for all damage resulting from sheeting and bracing failure or from placing, maintaining and removing it.

3.03 REMOVAL OF WATER

- A. It is a basic requirement of these Specifications that excavations shall be free from water before pipe or structures are installed.
- B. The Contractor shall provide pumps, and other appurtenant equipment necessary to remove and maintain water at such a level as to permit construction in a dry condition. The Contractor shall continue dewatering operations until backfilling has progressed to a sufficient depth over the pipe to prevent flotation or movement of the pipe in the trench or so that it is above the water table. If at any point during the dewatering operation it is determined that fine material is being removed from the excavation sidewalls, the dewatering operation shall be stopped if acceptable to the Owner. If any of the subgrade or underlying material is disturbed by movement of groundwater, surface water, or any other reason, it shall be replaced at the Contractor's expense with crushed stone or gravel.
- C. The Contractor shall use dewatering systems that include automatic starting devices, and standby pumps that will ensure continuous dewatering in the event of an outage of one or more pumps.
- D. Water from the trenches and excavation shall be disposed of in such a manner as will not cause injury to public health, to public or private property, to the Work completed or in progress, to the surface of the streets, cause any interference with the use of the same by the public, or cause pollution of any waterway or stream. The Contractor shall submit his proposed methods of handling trench water and locations at which the water will be disposed of to the Owner for review and shall receive acceptance before starting the excavation. Disposal to any surface water body will require silt screens to prevent any degradation in the water body.

3.04 TRENCH STABILIZATION

- A. No claim for extras or additional payment will be considered for cost incurred in the stabilization of trench bottoms which are rendered soft or unstable as a result of construction methods, such as improper or inadequate sheeting, dewatering or other causes. In no event shall pipe be installed when such conditions exist and the Contractor shall correct such conditions so as to provide proper bedding or foundations for the proposed installation at no additional cost to the Owner before placing the pipe or structures.

3.05 PIPE BEDDING

- A. Pipe trenches shall be excavated as described in Article 3.01. The resulting excavation shall be backfilled with acceptable pipe bedding material, up to the level of the centerline of the proposed pipe barrel. This backfill shall be tamped and compacted to provide a proper bedding for the pipe and shall then be shaped to receive the pipe. Bedding shall be provided under the branch of all fittings to furnish adequate support and bearing under the fitting.

- B. Any excavation below the levels required for installation of the pipe bedding shall be backfilled with acceptable bedding material, tamped, compacted and shaped to provide proper support for the proposed pipe, at the Contractor's expense.

3.06 BACKFILL

- A. Pipeline trenches shall be backfilled to a level 12 inches above the top of the pipe with select backfill obtained from the excavation. Such material shall be placed in 6-inch layers; each compacted to the densities specified in Article 3.07. Only hand operated mechanical compacting equipment shall be used within six inches of the installed pipe.
- B. After the initial portion of backfill has been placed as specified above, and after all excess water has completely drained from the trench, backfilling of the remainder of the trench may proceed. The remainder of the backfill shall be selected material obtained from the excavation and shall be placed in horizontal layers, the depth of which shall not exceed the ability of the compaction equipment employed, and in no event shall exceed a depth of 12 inches. Each layer shall be moistened, tamped, puddled, rolled or compacted to the densities specified in Article 3.07.

3.07 COMPACTION AND DENSITIES

- A. Compaction of backfill shall be 98 percent of the maximum density where the trench is located under structures or paved areas, and 95 percent of the maximum density elsewhere. More thorough compaction may be required when Work is performed in other regulatory agencies jurisdictions, such as the DOT. Methods of control and testing of backfill construction are:
 - 1. Maximum density of the material in trenches shall be determined by ASTM D1557.
 - 2. Field density of the backfill material in place shall be determined by ASTM D1556 or D2922.
- B. Laboratory and field density tests, which in the opinion of the Owner are necessary to establish compliance with the compaction requirements of these Specifications, shall be ordered by the Owner. The Contractor shall coordinate and cooperate with the testing laboratory. The testing program will be implemented by the Owner establishing depths and locations of tests. Modifications to the program will be made as job conditions change.
- C. Trench backfill which does not comply with the specified densities, as indicated by such tests, shall be reworked and recompacted until the required compaction is secured, at no additional cost to the Owner. The costs for retesting such Work shall be paid for by the Contractor.

3.08 ADDITIONAL EXCAVATION AND BACKFILL

- A. Where organic material, such as roots, muck, or other vegetable matter, or other material which, in the opinion of the Owner, will result in unsatisfactory foundation conditions, is encountered below the level of the proposed pipe bedding material, it shall be removed to a

depth of two feet below the outside bottom of the pipe or to greater depths as directed by the Owner and removed from the site. Sheeting shall be installed if necessary to maintain pipe trenches within the limits identified by the Owner. The resulting excavation shall be backfilled with suitable backfill material, placed in 12-inch layers, tamped and compacted up to the level of the bottom of the proposed pipe bedding material. Sufficient compaction of this material shall be performed to protect the proposed pipe against settlement. Construction shall then proceed in accordance with the provisions of Article 3.05 "Pipe Bedding".

- B. Additional excavation (more than two feet below the pipe) as indicated on the trench detail shall be performed only when ordered by the Owner. Where organic or other material is encountered in the excavation, the Contractor shall bring the condition to the attention of the Owner and obtain his determination as to whether or not the material will require removal, prior to preparing the pipe bedding. The excavation of material up to a depth of two feet below the outside bottom incidental items of construction and the Work shall be done at the Contractor's expense.

- END OF SECTION -

SECTION 02446

HORIZONTAL DIRECTIONAL DRILLING

PART 1 -- GENERAL

1.01 SECTION DESCRIPTION

- A. Portions of the pressure mains shall be installed by Horizontal Directional Drilling (HDD), also commonly known as directional bore, within the limits indicated on the contract plans and as specified herein. Generally, as a minimum, the pressure main is to be located within the road right-of-way or Utility Easement and shall be installed by HDD and conventional open cut installation. Piping not designated for installation by a specific method may be installed by open trench or directional boring, as approved by the Engineer.
- B. The requirements set forth herein specify a wide range of procedural precautions necessary to ensure that the very basic, essential aspects of a proper directional bore installation are adequately controlled. Strict adherence shall be required under specifically covered conditions outlined in this specification. Adherence of the specifications contained herein, or the Engineer's approval of any aspect of any directional bore operation covered by this specification, shall in no way relieve the Contractor of their ultimate responsibility for the satisfactory completion of the work authorized under the Contract.
- C. This sections includes materials, performance and installation standards, and Contractor responsibilities associated with the furnishing of all labor, materials, equipment and incidentals required to install, complete, required trenchless installation of pressure mains, as shown on the Drawings and as specified herein.

1.02 EXPERIENCE

- A. HDD installer shall have demonstrated by previous experience ability to do the work. The required previous experience shall consist of having performed a minimum of four (4) horizontal directional drill installations of 500 feet or more using 10" or greater diameter pipe. The references should include a name and telephone number where contact can be made to verify the contractor's capability. The Contractor must provide documentation showing successful completion of the projects used for reference. Conventional trenching experience **will not** be considered applicable.
- B. All supervisory personnel must be adequately trained and will have at least four years experience in directional boring. The Contractor will have to submit the names and resumes of all supervisory field personnel prior to construction.
- C. The Contractor shall have equipment and expertise, appropriate for horizontal directional drilling installations. This includes the preparation and maintenance of the bore path using drilling fluids appropriate for the geology of the soils. The Contractor shall also have experience in safely and dependably installing, in similar geology, similar size and length of piping involved.

- D. Because of time constraints, the Contractor may wish to provide multiple experienced directional boring crews.

1.03 SUBMITTALS

- A. Following completion of the required field exploratory work and prior to HDD installation, the Contractor shall submit for approval a detailed work plan outlining the procedure and schedule to be used to execute the work. At a minimum the work plan shall include entry and exit points, entry and exit angles, any horizontal bend radii, and a profile showing points of tangent and curvature, vertical radii, and depth of the bore along the alignment. The work plan shall include a detailed description of all equipment to be used, including nameplate data for drilling equipment, mobile spoils removal units, down-hole tools, a list of personnel and their qualifications and experience (including back-up personnel in the event that an individual is unavailable), list of subcontractors, a schedule of work activity, a safety plan (including MSDS for drilling slurry components and any potentially hazardous substances to be used), traffic control plan, an environmental protection plan, projections of drilling fluid recirculation and recovery volumes, means of disposal of spent fluids, projected volume of solids removal, plan for disposal of solids, and contingency plans for possible problems. Work plan shall be comprehensive, realistic and based on actual working conditions for this particular project. Plan shall document the thoughtful planning required to successfully complete the project.
- B. Submit technical data for equipment including clay slurry material, method of installation with working drawings, and proposed sequence of construction for approval by the Engineer.
- C. Specifications and layout drawings for material to be used, including pipe and method(s) for joining pipe, shall be submitted to the Engineer for approval.

1.04 EQUIPMENT

The Contractor shall submit specifications on horizontal directional drilling equipment to be used to ensure that the equipment will be adequate to complete the work.

A. DRILLING SYSTEMS

The directional drilling machine shall consist of a hydraulically powered system to rotate, push and pull hollow drill pipe into the ground at variable angles down to 8 degrees above horizontal, while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall have a capacity to adequately complete the drilling and piping installation. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the crossing. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor the maximum pull-back pressure during the pull-back operation. The rig shall be grounded during drilling and pull-back operations. There shall be a system to detect electrical current from the drill string and an audible alarm, which automatically sounds when an electrical current is detected.

B. GUIDANCE SYSTEMS

Electronic monitoring of the bore depth and location shall be used to provide a continuous and accurate determination of the drill head during the drilling operation. The guidance shall be capable of tracking at the maximum depth required and in any soil condition, including hard rock whether under canals or adjacent to concrete or steel structures. It shall enable the driller to guide the drill head by providing immediate information to the tool face, azimuth (horizontal direction), and inclination (vertical direction). The guidance system shall be accurate to place the proposed pipe within a +/- 2-inch window both vertically and horizontally. Continuous monitoring of the boring head is required, including across open water if necessary. The guidance system shall be of a proven type and shall be setup and operated by personnel trained and experienced with this system. The Operator shall be aware of any geo-magnetic anomalies and shall consider such influences in the operation of the guidance system if using a magnetic system.

C. DRILLING FLUID (MUD) SYSTEM

A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid composed of bentonite clay, potable water and appropriate additives. Mixing system shall be able to molecularly shear individual bentonite particles from the dry powder to avoid clumping and ensure a thorough mixing. The drilling fluid reservoir tank shall be a minimum of 500 gallons. Mixing system shall continually agitate the drilling fluid during drilling operations.

D. OTHER EQUIPMENT

1. Pipe rollers shall be of sufficient size to fully support the weight of the pipe while being hydro-tested and during pull-back operations. Sufficient number of rollers shall be used to prevent excess sagging of pipe. Rollers shall be used as necessary to assist in pull-back operations and in layout/joining of pipe.
2. Hydraulic or pneumatic pipe rammers may only be used if necessary and with the authorization of the Engineer.
3. Other devices or utility placement systems for providing horizontal thrust other than those previously defined in the preceding sections shall not be used unless approved by the Engineer prior to commencement of the work. Considerations for approval shall be made on an individual basis for each specified location. The proposed device or system shall be evaluated prior to approval or rejection on its potential ability to complete the utility placement satisfactorily without undue stoppage and to maintain line and grade within the tolerances prescribed by the particular conditions of the project.

PART 2 -- PRODUCTS

- A. The Florida Department of Environmental Protection (FDEP) has approved the following drilling slurry compounds for this project:
 - 1. Mi SWACO Drilplex HDD, MSDS No. 12013 Revision Date 11/29/2007
 - 2. Mi SWACO Max Gel, MSDS No. 10618 Revision Date 02/11/2008
- B. If other drilling slurry compounds are proposed for drilling, Contractor must obtain approval from FDEP prior to start of HDD.
- C. The Contractor is required to bring to the attention of the Engineer any known design discrepancies with actual tunneling methods that the Contractor will be performing. This shall be stated to the Engineer no later than the pre-construction meeting.
- D. Non-toxic fluorescent dyes will be added to the drilling lubricant as a method of monitoring bentonite releases in the underwater portions of this drilling. Details of the fluorometry monitoring method shall be submitted to the Army Corp of Engineers at the pre-construction meeting.

PART 3 -- EXECUTION

3.01 GENERAL

- A. The Engineer must be notified 48 hours in advance of starting work. The directional bore shall not begin until the Engineer is present at the job site and agrees that proper preparations for the operation have been made. The Engineer approval for beginning the installation shall in no way relieve the Contractor of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract.
- B. Installation shall be in accordance with APWA publication "Trenchless Technology Applications in Public Works" and in a trenchless manner producing continuous bores.
- C. The tunneling system shall be remotely steerable and permit electronic monitoring of tunnel depth and location. Accurate placement of pipe within a $\pm$ 2-inch window is required both horizontally and vertically. Continuous monitoring of the boring head is required, including across open water if necessary.
- D. The directional boring Contractor will be required to submit certification, by a Professional Engineer or Professional Land Surveyor licensed in the State of Florida, that the directional boring has been performed in accordance to the construction drawings, or provide signed and sealed record drawings of the installation if it varies from the design as shown in the construction drawings.

3.02 DRILLING PROCEDURE

A. SITE PREPARATION

Prior to any alterations to the work site, the Contractor shall photograph or video the entire work area, including entry and exit points in accordance with Section 01010. Work site as indicated on the Plans, within right-of-way, shall be graded or filled to provide a level working area. No alterations beyond what is required for operations are to be made. The Contractor shall confine all activities to designated work areas. Prior to anchoring the drilling rig to the ground, the Contractor shall confirm locations of all underground utilities in the area of the drilling rig.

B. DRILL PATH SURVEY

The entire drill path shall be accurately surveyed by a Professional Surveyor and Mapper licensed in the State of Florida. Entry and exit stakes shall be placed in the appropriate locations within the areas indicated on the Plans. If the Contractor is using a magnetic guidance system, the drill path will be surveyed for any surface geo-magnetic variations or anomalies.

C. ENVIRONMENTAL PROTECTION

The Contractor shall place silt fence between all drilling operations and any drainage, wetland, waterway, or other area designated for such protection by the Contract Documents or state, federal, and local regulations. Additional environmental protection necessary to contain any hydraulic or drilling fluid spills shall be put in place, including berms, liners, turbidity curtains, and other measures. The Contractor shall adhere to all applicable environmental regulations. Fuel or oil may not be stored in bulk containers within 200 feet of any water body or wetland.

D. SAFETY

The Contractor shall adhere to all applicable state, federal, and local safety regulations and all operations shall be conducted in a safe manner. Safety meetings shall be conducted by the Contractor at least weekly with a written record of attendance and topic submitted to the Engineer.

E. PILOT HOLE

The pilot hole shall be drilled on the bore path with no deviations greater than ± 0.2 inch horizontally or vertically from the design path. The Contractor will notify the Engineer and the Engineer may require the Contractor to pull-back and re-drill from the location along the bore path before the deviation. In the event that a drilling fluid fracture, inadvertent returns, or returns loss occurs during pilot hole drilling operations, the Contractor shall cease drilling, wait at least 30 minutes, inject a quantity of drilling fluid with a viscosity exceeding 120 seconds as measured by a Marsh funnel, and then wait another 30 minutes. If mud fracture or returns loss continues, the Contractor will cease operations and notify the

Engineer. The Engineer and the Contractor will discuss additional options and work will then proceed accordingly. If a fracture occurs under the river bed, the Contractor shall implement his frac-out plan in accordance with the ACOE permit.

F. REAMING

Upon successful completion of the pilot hole, the Contractor will ream the bore hole to a minimum of 25% greater than the outside diameter of the pipe using the appropriate tools. The Contractor will not attempt to ream at one time more than the drilling equipment and mud system are designed to safely handle.

G. PULL-BACK

After successfully reaming the bore hole to the required diameter, the Contractor will pull the pipe through the bore hole. In front of the pipe will be a swivel. Once pull-back operations have commenced, operations must continue without interruption until the pipe is completely pulled into the bore hole. During pull-back operations, the Contractor will not apply more than the maximum safe pipe pull pressure at any time. In the event that the pipe becomes stuck, the Contractor will cease pulling operations to allow any potential hydro-lock to subside and will commence pulling operations. If the pipe remains stuck, the Contractor will notify the Engineer. The Engineer and the Contractor will discuss options and then work will proceed accordingly.

3.03 ADDITIONAL REQUIREMENTS

- A. Mechanical, pneumatic, or water-jetting methods will be considered unacceptable.
- B. After an initial bore has been completed, a reamer will be installed at the termination pit and the pipe will be pulled back to the starting pit. The reamer must also be capable for discharging liquid clay to facilitate the installation of the pipe into a stabilized and lubricated tunnel.
- C. Upon completion of boring and pipe installation, the Contractor will remove all spoils from the starting and termination pits. The area surrounding the pits will be restored to their original condition.
- D. The shoulders, ditches, banks and slopes of roads and railroads crossed and paralleled shall be restored to their former condition and properly sodded so that they shall not wash out before becoming consolidated. Restoration shall be as required by the jurisdictional authority and as specified within the Contract Documents. Road and railroad crossings and parallel installations are to be continuously maintained until the completion of the work. No compensation shall be paid for Contractor's repair or maintenance of crossing and parallel installations.

- END OF SECTION -

SECTION 02500

SURFACE RESTORATION

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. Items specified in this Section include repairs to concrete sidewalks and landscaped and grassed areas that may be damaged by Contractor activities.
- B. The Contractor shall videotape all areas to be affected by his construction operations. Copies of this videotape will be provided to the Owner. This videotape will be used to verify that all affected areas are restored to original conditions prior to final acceptance of the Work.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01530 - Protection of Existing Facilities

1.03 SUBMITTALS

- A. The Contractor shall submit submittals for review in accordance with the Section 01300 entitled "Submittals".

1.04 PROTECTION OF EXISTING IMPROVEMENTS

- A. The Contractor shall be responsible for the protection of all pavements, concrete sidewalks, and other improvements within the work area. All damage to such improvements, as a result of the Contractor's operations, beyond the limits of the work of pavement replacement as described herein, shall be repaired by the Contractor at his expense, as specified hereinafter.

1.05 GUARANTEE

- A. The Contractor shall guarantee all ground cover planted or replanted under this Contract for a period of one (1) year beyond acceptance of the project. In the event that any new plant or sod dies within the guarantee period, the Contractor shall be responsible for replacement in kind.

1.06 QUALITY ASSURANCE

- A. All landscape work and installation shall be in full compliance with local and state codes standards and regulations, the State of Florida "Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways" and "Manual of Traffic Control and Safe Practices for the Streets and Highway Construction Maintenance and Utility Operation."

PART 2 -- PRODUCTS

2.01 SOD

- A. Sod shall be Bahia grass sod or in kind and be of firm texture having a compacted growth and good root development. Sod shall be absolutely true to varietal type, live, fresh and free from weeds or other objectionable vegetation, fungus, insects and disease of any kind. The sod shall meet Florida State Plant Board Specifications. Each sod panel shall have sufficient root and soil base to assure proper sod growth. Sod shall be kept moist from the time it is field cut until it is laid at the proposed site.

PART 3 -- EXECUTION

3.01 GRADING

- A. Existing Soil Conditions: The Contractor shall notify the Owner when conditions detrimental to plant growth are encountered before proceeding with any planting operations.
- B. Removal of Rubbish: Any objectionable materials such as stones or construction debris encountered on the field shall be promptly removed from the site before beginning any planting operations.
- C. The Contractor shall regrade the work areas disturbed by his construction activities to the existing grades prior to commencement of construction.

3.02 SIDEWALKS

- A. Sidewalks shall be restored in full section, rather than trench width plus 2 feet. The existing sidewalk shall be cut with an abrasive disc saw to trim the edges to straight and true lines, with edges parallel and rectangular in plan. The interior concrete shall then be broken up and removed from the site.
- B. Sidewalks shall be replaced with a concrete slab having a minimum thickness of 6 inches. If the existing sidewalk has reinforcing, the new sidewalk shall be constructed to match the existing.
- C. Replaced sidewalks shall match the elevation and alignment of existing sidewalks wherever a connection is made.
- D. The Contractor shall provide adequate means to protect sidewalk installations from damage from vandals, animals, weather or other causes, until the concrete is hard. Should damage occur from such causes, the Contractor shall remove and replace the damaged item at his own expense.
- E. The subgrade shall be smooth and compacted to the required density and elevation prior to placing of the concrete. Water shall be uniformly applied ahead of the concrete placement operations so that the subgrade is moist at the time the concrete is placed.
- F. After the concrete has been placed in the forms, the Contractor shall perform the following sequence of operations to complete the sidewalk installation: strike-off; vibratory

consolidation; screeding; floating; removal of laitance; straight edging; final surface finish; and curing.

3.03 SODDING

- A. General: Sod shall be placed on all lawn areas disturbed by construction activities.
- B. Bed Preparation: Areas to be sodded shall be cleared of all rough grass, weeds and debris, and the ground brought to an even grade acceptable to the Owner. Planting soil shall be spread to the required depths and shall be of a uniform grade, smooth with no peaks or valleys and free of any debris.
- C. Sod Handling and Installation: During delivery, prior to planting, and during the planting of the lawn areas, the sod panels shall at all times be protected from excessive drying and unnecessary exposure of the roots to the sun.
- D. Sod shall be laid within 72 hours of cutting. Sod panels shall be laid tightly together so as to make a solid sodded lawn area. Immediately following sod laying the lawn areas shall be rolled with a lawn roller customarily used for such purposes, as acceptable to the Owner and then thoroughly watered.
- E. Contractor shall be responsible to keep sod watered for the duration of the project and until it is thoroughly established.
- F. The sod edge shall be placed in a neat, clean manner to the edge of all paving and shrub areas and acceptable to the Owner.
- G. Sod shall be alive and in growing condition at the completion of the project. Unacceptable sod shall be replaced.

3.04 FINAL ACCEPTANCE

- A. A final review of all planting installations shall be made by the Owner and the Contractor prior to the conclusion of the project or the warranty period upon written notice requesting such review submitted by the Contractor prior to the anticipated date. After review, the Contractor shall be notified of acceptance or deficiencies in the work and subject to rechecking before final acceptance. The warranty period for all replacements shall be extended for an additional one (1) year.

- END OF SECTION -

SECTION 02510

ASPHALTIC CONCRETE PAVEMENT

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. Construct asphaltic concrete pavement in accordance with the lines, grades and typical section as indicated on the Drawings, specified herein and as required for a complete installation.

1.02 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. DOT Specifications: The phrase "DOT Section", shall refer to the Section specified in Florida Department of Transportation Standard Specifications for Road and Bridge Construction. The DOT Specifications, are referred to herein and are hereby made a part of this Contract to the extent of such references, and shall be as binding upon the Contract as though reproduced herein in their entirety.

DOT 160	Stabilizing
DOT 200	Limerock Base
DOT 300	Prime and Tack Coats for Base Courses
DOT 320	Hot Bituminous Mixtures - Plant Methods and Equipment
DOT 330	Hot Bituminous Mixtures - General Construction Requirements
DOT 331	Type S Asphaltic Concrete
DOT 337	Asphaltic Concrete Friction Courses
DOT 902	Fine Aggregate
DOT 911	Limerock Material for Base and Stabilized Base
DOT 916	Bituminous Materials

1.03 SUBMITTALS

- A. The Contractor shall submit his proposed formula for the asphaltic concrete paving for review in accordance with Section 01300 - Submittals.

1.04 QUALITY CONTROL

- A. The phrase "DOT Specifications" shall refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. The DOT Specifications, are referred to herein and are hereby made a part of this Contract to the extent of such

references, and shall be as binding upon the Contract as through reproduced herein in their entirety.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Limerock Base

1. The limerock base shall consist of either one or two courses of Miami or Ocala limerock or crushed coquina in accordance with Section 200 and 911 of the DOT Specifications.

B. Prime Coat

1. The material used for the prime coat shall be cut-back Asphalt Grade RC-70 conforming to Sections 300 and 916 of the DOT Specifications for prime to be used on Miami Oolite formation limerock.

C. Tack Coat

1. The material used for the tack coat shall be Emulsified Asphalt Grade RS-2 conforming to Sections 300 and 916 of the DOT Specifications. The complete site shall receive a final tack coat to provide a uniform finish for all new and existing paving at the plant site.

D. Asphaltic Concrete

1. The materials and construction of the asphaltic concrete patch and surface courses shall be Type S-I Asphaltic Concrete conforming to Sections 330, 331 and 916 of the DOT Specifications.

PART 3 -- EXECUTION

3.01 INSTALLATION

- A. Roadway subgrades shall be stabilized to the minimum depth shown on the Drawings to a Limerock Bearing Ratio of not less than 40. Stabilizing shall be Type B as defined in Section 160 of the DOT Specifications. Stabilization may require the addition and thorough mixing in of crushed limerock, coarse limerock screenings, or any other stabilizing material acceptable to the Owner. The stabilizing material shall be applied in such quantity that, after mixing and blending, the subgrade will have a LBR of not less than 40. Stabilizing material shall be mixed or blended in the subgrade material by plowing, scarifying, disk, harrowing, blading and mixing with rotary tillers until the mixed materials are of uniform bearing value throughout the width and depth of the layer being processed.
- B. At least three density determinations shall be made on each day's final compaction operations on each course and the density determinations shall be made at more frequent intervals if deemed necessary by the Owner.

- C. The limerock base shall be constructed in accordance with Section 200 of the DOT Specifications, to the thickness and width indicated on the Drawings.
- D. After spreading of the base material is completed, the entire surface shall be scarified and shaped so as to produce the exact grade and cross section after compaction. For double course base, this scarifying shall extend a depth sufficient to penetrate slightly the surface of the first course. The maximum depth of each lift shall be 8-inches.
- E. When the material does not have the proper moisture content to insure the required density, wetting or drying shall be required. If the material is deficient in moisture, water will be added and uniformly mixed in by disking the base course to its full depth. If the material contains an excess of moisture, it shall be allowed to dry before being compacted. As soon as proper conditions of moisture are attained, the material shall be compacted to an average density not less than 98 percent maximum density as determined in more than one course, the density shall be obtained in each lift of the base.
- F. During final compacting operations, if blading of any areas is necessary to obtain the true grade and cross section, the compacting operations for such areas shall be completed prior to making the density determination on the finished base.
- G. Unless otherwise directed by the Owner, the surface shall be "hard-planed" with a blade grader immediately prior to the application of the prime coat to remove the thin glaze or cemented surface and to allow free penetration of the prime material. The materials planed from the base shall be removed from the base area.
- H. If cracks or checks appear in the base, either before or after priming, which in the opinion of the Owner, would impair the structural efficiency of the base course, the Contractor shall remove such cracks or checks by rescarifying, reshaping, adding base material where necessary and recompacting, at no additional cost to the Owner.
- I. If at any time the subgrade material shall become mixed with the base course material, the Contractor shall, without additional compensation, dig out and remove the mixture, reshape and compact the subgrade and replace the materials removed with clean base material, which shall be shaped and compacted as specified above.
- J. The prime coat shall be applied at a rate of 0.15 gallons per square yard and the Work performed in accordance with Section 300 of the DOT Specifications.
- K. The tack coat shall be applied at a rate between 0.02 and 0.10 gallons per square yard and the Work performed in accordance with Section 300 of the DOT Specifications.
- L. The spreading, compacting and jointing the wearing surface shall be in accordance with Sections 330 and 331 of the DOT Specifications to the thickness indicated on the Drawings.

3.02 PAVEMENT REPAIR

- A. All damage to pavement as a result of Work under this Contract shall be repaired in a manner satisfactory to the Owner and at no additional cost to the Owner. The repair shall include the preparation of the subgrade, the placing and compacting of the limerock base, the priming of the base, the placing and maintaining of the surface treatment, all as specified herein.

- B. The width of all repairs shall extend at least 12 inches beyond the limit of the damage. The edge of the pavement to be left in place shall be cut to a true edge with a saw or other acceptable method so as to provide a clean edge to abut the repair. The line of the repair shall be reasonably uniform with no unnecessary irregularities.

- END OF SECTION -

SECTION 02574

PAVEMENT REMOVAL AND REPLACEMENT

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall cut, remove, protect, and replace existing pavements of the various types encountered including, roadways, driveways, sidewalks, curbs, and combination curb and gutter.
- B. Protection of Existing Improvements: The Contractor shall be responsible for the protection of all pavements, sidewalks, and other improvements within the work area. All damage to such improvements, as a result of the Contractor's operations, beyond the limits of the Work of pavement replacement as described herein, shall be repaired by the Contractor at his expense.

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Materials including limerock, bituminous prime and tack coat, and asphaltic concrete for the above Work shall meet the requirements established therefore by the FDOT Specifications.
 - 1. Limerock shall be Miami or Ocala Limerock, or crushed coquina.
 - 2. Bituminous prime coat material shall be cutback asphalt Grade RC-70.
 - 3. Bituminous tack coat material shall be emulsified asphalt Grade RS-2.
 - 4. Asphaltic concrete shall be Type S-I.

PART 3 -- EXECUTION

3.01 PREPARATION

- A. Pedestrian or school crossings: Where the work crosses or interferes with school or pedestrian crossings, extreme care shall be taken by the Contractor to ensure the safety of school children or other pedestrians.

3.02 PERFORMANCE

A. Removals

1. Pavement Removal: Where existing pavement is to be removed, the surfacing shall be mechanical saw cut prior to trench excavation, leaving a uniform and straight edge, with minimum disturbance to the remaining adjacent surfacing. The width of cut for this phase of existing pavement removal shall be minimal.
2. Sidewalk, Drive, and, Curb Removal: Concrete sidewalks, curbs, combination curb and gutter, walks, drive ribbons, or driveways shall be removed by initially sawing the structure with a suitable power saw as specified above for pavement. When a formed joint in the concrete exists within three (3) feet of the proposed saw cut and parallels the proposed saw cut, the removal line shall be extended to the formed joint. After sawing, the material shall be removed.

B. Restorations

1. General: Street or roadway pavement cut and removed in connection with trench excavation shall be replaced or restored in equal or better condition than the original and as shown on the Drawings. All restorations shall be a complete overlay of the road surface.
2. Pavement Restoration - Asphalt:
 - a. Limerock base course shall be compacted for its full thickness to not less than 98 percent of maximum density as determined by AASHTO T-180.
 - b. Construction methods and equipment shall generally meet the requirements therefore as established in the FDOT Specifications, but shall be modified to meet the relatively narrow strip construction conditions. Any such modifications shall be approved by the Owner prior to their use.
 - c. Joints with existing surface and base shall be straight and neat. If it is necessary to obtain a straight net joint, the Contractor shall cut out sufficient existing material and replace it with new material.
 - d. The upper surface of the completed base course shall be compacted to an elevation to permit the full depth of the surface course to be at the pavement surface. The completed surface shall match the line and grade of the existing surface. When pavement is removed to the edge of the roadway, the replaced base course shall extend not less than six (6) inches beyond the edge of the surfacing constructed without deviating from the grade.
3. Driveway Restoration - Asphalt: Driveway pavement with limerock base cut and removed in connection with trench excavation shall be replaced or restored as specified above for street or roadway pavement, with the exception that the new limerock base course shall equal the existing base course in thickness, except that in no case shall new driveway base course be less than six (6) inches in

thickness. Muck or unsuitable material found under existing driveway construction will not be removed and replaced.

4. Concrete, Sidewalk, Walkway, Driveway Ribbon, and Curb Restoration:

- a. Concrete sidewalks, walkways, driveways, driveway ribbons, and curbs required to be removed for the installation of facilities under this Contract shall be restored. Class B concrete shall be used in all cases.
- b. Replaced portions of these items shall conform to the lines, grades, and cross sections of the removed portions. Concrete sidewalks and walkways shall be of 4-inch thickness; concrete driveways and driveway ribbons shall be of 6-inch thickness. Replaced concrete curb and/or gutter shall joint neatly to the remaining section.

5. Pavement Restoration - Concrete: Rigid pavement shall be replaced in kind with Class B concrete, using high early strength cement.

- END OF SECTION -

SECTION 02750
PORTLAND CEMENT CONCRETE PAVING

PART 1-GENERAL

1.01 WORK INCLUDED

- A. Provide labor, materials, equipment transportation, and services to complete the construction of walks and other concrete areas and the installation Portland Cement Concrete Paving work, as indicated on the drawings, as specified herein, or both.
- B. Including, but not necessarily limited to the following:
 - 1. Fill, subgrade, and lime rock base
 - 2. Concrete form work
 - 3. Concrete reinforcement
 - 4. Concrete paving
 - 5. Thrust blocks for waterlines

1.02 RELATED WORK

- A. Division 2- Fine Grading

1.03 QUALITY ASSURANCE

- A. Inspection and Testing:
 - 1. Test Cylinders- ASTM C-39
 - a. Minimum of three (3) concrete test cylinders shall be taken for every 50 or less cubic yards of concrete placed.
 - b. Minimum of one (1) additional test cylinder shall be taken during any cold weather concreting, and be cured on job site under same conditions as the concrete in represents.
 - 2. Slump Test – ASTM C-143
 - a. Minimum of one (1) slump test shall be taken for each set of test cylinders taken.

1.04 SUBMITTALS

- A. Test reports of concrete compression, yield, air content, and slump tests.
- B. Certificates
 - 1. Manufacturer's certification that materials meet specification requirements.
 - 2. Material content per cubic yard of each class of concrete furnished.
 - a. Dry weights of cement

- b. Saturated surface-dried weights of fine and coarse aggregate
- c. Quantities, type, and name of admixtures
- d. Weight of water

3. Ready-mix delivery tickets, ASTM C-94

C. Shop Drawings

- 1. Show sizes and dimensions for fabrication and placing of wire mesh or reinforcing steel and bar supports.
- 2. Indicate bar schedules, stirrup spacing, and diagrams of bend bars.
- 3. Detail items of form systems affecting appearance of architectural concrete surfaces such as joints, tie holes, liners, patterns, and textures. Show items in relation to entire form system.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver reinforcement to project site in bundles marked with metal tags indicating bar size and length.
- B. Handle and store materials to prevent contamination.

1.06 PROJECT CONDITIONS

- A. Allowable concrete temperatures
 - 1. Hot Weather: Maximum 90°F as per ASTM C-94
- B. Do not place concrete during rain, unless protection is provided.

PART 2- MATERIALS

2.01 READY-MIXED CONCRETE

- A. Cement
 - 1. ASTM C-150, Normal Type 1
- B. Admixtures
 - 1. Air entraining: ASTM C-260-77
 - 2. Water –Reducing: ASTM C494-82, Type A
 - 3. Water-Reducing and Retarding: ASTM C494-92, Type D
 - 4. Do not use calcium chloride or admixtures containing more than one percent (1%) chloride ions.

- C. Coarse Aggregate
 - 1. Not less than 50% clean, hard, crushed, stone conforming to requirements of Table 2, size number 467 ASTM C-33.
- D. Slump 3-inch maximum; plus tolerance 0, minus tolerance 1 inch.
- E. Air Content: 5%, +/- 1%
- F. Mix Proportioning
 - 1. 28-day compressive strength of moist cured laboratory samples 3,500 PSI.
 - 2. Minimum cement content five sacks/cubic yard.
- G. Curing Material: Liquid membrane, ASTM C-309, Type 1
- H. Clear Sealer
 - 1. Clear as manufactured by Guardian Chemical Company, or approved equal.
- I. Mixes
 - 1. ASTM C-94
 - 2. Mix concrete only in quantities for immediate use.
 - 3. Do not retemper or use set concrete.

2.02 REINFORCEMENT

- A. Reinforcing Steel Bars
 - 4. 60 PSI yield strength; deformed billet steel bars; ASTM A-615, plain finish
- B. Tie Wire
 - 1. FS QQ-Wj-461-G, annealed steel, black, 16ga minimum.
- C. Bar Supports
 - 1. Conform at "Bar Support Specifications", CRSI Manual of Standard Practice.

2.03 FORMWORK AND ACCESSORIES

- A. Formwork: Matched tight fitting and adequately stiffened to support weight of concrete without deflection, detrimental to tolerance and appearance of concrete, conform with ACI 347, Chapter 3, Material and Form Work.

B. Lumber

1. Softwood framing lumber: kiln dried, PS-20.
2. Boards less than 1.5 inch thick and 2 inch used for basic forms and form liners: Kiln dried.
3. Grade-marked by grading rules agency approved by American Lumber Standards Committee.
4. Light framing or studs for board or plywood forms, 2-inch to 4-inch width and thickness Construction Standard grade.
5. Boards for basic forms Construction Standard grade.
6. Board surface: smooth.

C. Plywood

1. Exterior type softwood plywood, PS 1-66.
2. Each panel stamped or branded indicating veneer grades, species, type, and identification.
3. Wood faced plywood for architectural concrete surfaces.
 - a. Panel veneer grades: B-C.
 - b. Mill-oiled sides and mill sealed edges of panels.

D. Ties

1. Material: stainless steel
2. Type: snap ties
3. Depth or break back: 1 inch
4. Maximum diameter: ¼ inch

E. Form Coatings

1. Non-staining type
2. Agent: pine oil derivative

2.04 WATER

- A. Clean and potable.

2.05 GROUT

A. Non-Shrink Grout

1. Premixed, nonferrous, cementitious mixture with a 28-day strength of at least 6,000 PSI. Mixtures to be placed in excess of a one-inch (1") thickness may include 3/8" pea gravel.

2.06 EXPANSION JOINT

- A. Joint Material: Joint sealer is to be gray Sonolastic SLI, manufactured by Rexword Chemical Products, Inc., Minneapolis, MN or approved equal.

PART 3- EXECUTION

3.01 BARRICADES

- A. Provide temporary barricades around areas of operation and maintain until work under this section is completed and approved.
- B. Install temporary traffic, markers, signals, and signs to:
 - 1. Eliminate potential hazardous conditions.
 - 2. Maintain adequate traffic patterns free of conflict with work under this contract.

3.02 PREPARATION OF SUBGRADE

- A. Bring subgrade to required elevations. The finished subgrade shall be maintained in a smooth compact condition and any areas which are disturbed prior to placing of the concrete shall be restored at the Contractor's expense. The subgrade shall be moist at the time the concrete is placed. Water shall be uniformly applied ahead of the pouring operations as directed by the Owner's representative. Debris and obstruction shall be removed to a minimum depth of 6 inches (6") below the finished subgrade elevation, and the space shall be back filled with sand, base course material, or other suitable material which shall be thoroughly compacted by rolling or tamping.
- B. Fill soft spots and hollows with additional fill. The subgrade shall be accurately trimmed to the required elevation with a ¼ inch tolerance. High areas shall be trimmed to proper elevation. Low areas may be filled with suitable material and compacted to the specified density or filled with concrete integrally with the placing of the pavement
- C. Level and compact subgrade to receive rock base for concrete walks, curbs, and gutters, to 98% compaction per AASHTO T-180.

3.03 FORMWORK

- A. Design, construct, and remove for safety of formwork and shoring.
- B. Provide forms to shape, lines, and dimensions of members shown: substantial tight enough to prevent leakage, and properly braced or tied to maintain position and size, and form sides and bottoms of members.
- C. Fill voids of plywood joints with sealant and tool smooth.
- D. Form vertical surfaces to full depth and securely position to required lines and levels. Do not place form ties to pass through concrete.
- E. Arrange and assemble formwork to permit easy dismantling and stripping, and to prevent damage to concrete formwork removal.

3.04 REINFORCING

- A. Reinforce concrete walks, curbs, and gutters as shown on the plans and details. Allow for minimum 2 inch concrete cover.
- B. Do not extend reinforcing through expansion and contraction joints. Provide doweled joint through expansion and contraction joints, with one end of dowels fitting with capping sleeve to allow free movement.

3.05 FORMING EXPANSION AND CONTRACTION JOINTS

- A. Place expansion joints as shown on the drawings (approximately 30' O.C. spacing) and contraction joints as shown on the drawings (approximately 5' O.C.). Where curbs abut walks, make joints coincide. When sidewalks abut building, provide continuous joint filler.
- B. Fit joints with filler of required profiles, set perpendicular to longitudinal axis of walks, curbs, and gutters. Recess ½ inch below finished concrete surface.

3.06 INSPECTION

- A. Assure that excavation and formwork are completed and excess water is removed.
- B. Check that reinforcement is secured in place.
- C. Verify that expansion joint material, anchors, and other embedded items are secured in position.

3.07 PREPARATION FOR POURS

- A. Notify the Owner and other inspectors at least 24 hours prior to inspection.
- B. Equipment forms and reinforcing shall be clean and wet down, reinforcing firmly secured in place, runways set up and not resting on or displaying reinforcing.

3.08 PLACING CONCRETE

- A. Mixing and conveying shall be as per ASTM C-94 and as follows:
 - 1. Maximum elapsed time from addition of water to placing in forms – 90 minutes (total mixing time). Do not place partially hardened concrete.
 - 2. Concrete handled and placed by methods which keep concrete plastic, prevent separation of materials, and do not displace reinforcement.

B. Deposit as close as possible to final position to avoid segregation of materials. Restrict drop to 3-foot maximum (less for exposed concrete), using tremie if necessary. Do not allow concrete to spill over forms when placing. Use shovels for hand spreading, not rakes. The concrete shall be distributed on the subgrade to such depth that, when it is consolidated and finished, the thickness required by the drawings will be obtained at all points and the surface will at no point be below the grade specified for the finished surface. The concrete shall be deposited on the subgrade in a manner which will require as little re-handling as possible. Placing of the concrete shall be continuous between transverse joints, without the use of intermediate bulkheads.

1. Compact by mechanical vibration to thoroughly work around reinforcing and eliminate honeycomb.

C. Place concrete in accordance with ACI 301.

D. Hot Weather Placement: ACI 301

E. Cold Weather Placement: ACI 301.

F. Space concrete around gangs of parallel conduit.

G. Ensure reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.

H. Maintain concrete cover around reinforcing as follows:

Item	Coverage
Walls (exposed to weather to backfill)	2 inch
Footing and Concrete Formed Against Each	3 inch
Slabs on Fill	2 Inch

Do not place concrete within 25 feet (25') of workmen who are placing or securing reinforcing.

I. Place concrete continuously between predetermined construction and control joints. Do not break or interrupt successive pours such that cold joints occur.

J. Separate exterior slabs on fill from vertical surfaces with joint filler. Extend joint filler from bottom of slab to within ½ inch of finished slab surface.

K. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Owner's Representative upon discovery.

L. Bond joint between hardened and fresh concrete as follows: roughen surface, clean off foreign matter and laitance, and dampen with water.

M. Round edges, including edges of expansion and contraction joints, with ½ inch radius edging tool.

- N. Where concrete curbs are adjacent to pavement slabs, make concrete curbs and gutters integral with slabs. Make expansion and contraction joints of curbs coincide with slab joints.
- O. Do not vary finished surfaces from true lines, levels, or grade by more than 1/8 inch in 10 feet when measured with straightedge.
- P. Apply curing compound on finished surfaces immediately after placement. Apply in accordance with manufacturer's recommendations.
- Q. Saw cutting will not be permitted.
- R. Striking-Off, Consolidating and Finishing Concrete: Immediately after placing, the concrete shall be struck off, consolidated and finished, to produce a finished product conforming to the cross section, width and surface finish required by the Drawings and Specifications.
- S. Contraction Joints: Provide contraction joints, sectioning concrete into areas as shown on the Drawings. Construction joints for a depth equal to at least $\frac{1}{4}$ concrete thickness, as follows:
 - 1. Tooled Joints: Form joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with jointer.
 - 2. Sawed Joints: If required, form joints using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon (no more than 12 hours) as surface will not be torn, abraded, or otherwise damaged by cutting action.
 - 3. Contraction joints shall be placed at intervals equal to the width of the slab for walks; intervals shall not exceed 10 feet.
 - 4. Contraction joints from concrete banding shall be at 10 foot intervals.

3.09 CONCRETE FINISHING

- A. Unexposed concrete work shall be patched and repaired immediately after removal of forms.
 - 1. Cut off metal ties a minimum of one inch (1") back from surface on concrete.
 - 2. Moderate honeycomb cut out of prepared for patching. Severe honeycomb with exposed steel reinforcing is to be removed and replaced.
 - 3. Wet areas for patching and pack carefully with rich mortar rubbed to match surface.

- B. Provide concrete surfaces to be left exposed, walls, columns, beams, with smooth rubbed finish.
- C. Concrete work cross slope shall be 1% minimum/ 2% maximum. Longitudinal sloping shall meet current ADA requirements.
- D. Exposed concrete work shall be patched and repaired as accepted by Owner's Representative after consultation. Patching and rubbing will be kept to a minimum if possible, but when necessary will be done with great care to obtain maximum degree of matching in color and texture to adjacent finished concrete surfaces.
- E. Monolithic finish using care to obtain a level of surface; floors out of level or with variation greater than 1/8 inch to 10 feet shall be corrected.
- F. All finishes shall be as called for on the drawings.
- G. Concrete Finishes:
 - 1. After striking-off and consolidating concrete, smooth the surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust the floating to compact the surface and produce a uniform texture. The use of additional water will be prohibited in all phases of the finishing.
 - 2. After floating, test surface for trueness with a 10 foot straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
 - 3. Work edges of gutters, back top edge to curb, score lines and formed joints with an edging tool and round to ½" radius, unless otherwise indicated. Eliminate any tool marks on concrete surface.
 - 4. After completion of floating, and when excess moisture or surface sheen has disappeared, complete surface finishing.
 - 5. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas on exposed banding. Remove and replace areas or sections with major defects.
- H. General: Construction expansion, contraction, and construction joints true-to-line with face perpendicular to surface of the concrete, unless otherwise indicated. Construct transverse joints at right angles to the centerline, unless otherwise indicated.
- I. Curing:
 - 1. After the finishing operations have been completed and as soon as the concrete has hardened sufficiently that marring of the surface will not occur, the entire surface and the edges of the newly placed

concrete shall be water cured by misting or covering with a double thickness of burlap, cotton mats, or other approved material kept thoroughly saturated with water.

2. The forms shall be kept wet until removed and upon removal, the curing specified herein shall be started immediately.
3. Concrete shall be cured for a period of 7 days for normal Portland cement or 4 days for high early strength cement.
4. Concrete poured in the dry shall not be submerged until it has attained sufficient strength to adequately sustain the stress involved, nor shall it be subjected to flowing water across the surface for 4 days.
5. Curing for stand gray work after finishing, cure concrete by keeping moist for one (1) week after placement. Floors and vertical surfaces may be sprayed with an approved curing compound to retard evaporation of water, if spraying is not objectionable because of future finishing requirements. Begin curing operations as soon as the concrete has attained its initial set. Keep exposed concrete surface moist for at least one (1) week.

3.10 CONCRETE PATCHING AND REPAIRS

A. General

1. Do not patch until concrete has been reviewed by Owner's Representative. Repair surface defects, including tie holes, immediately after form removal. Dampen the area to be patched and an area at least six inches (6") wide surrounding it to prevent absorption of water from the patching mortar.

B. Removal of Defective Concrete

1. Remove all honeycombed and other defective concrete down to sound concrete. Cut edges perpendicular to the surface and cut back from true line a minimum of one inch (1") over the entire area. Avoid feathered edges.

C. Bonding Grout

1. Thoroughly dampen surfaces to be patched and apply a coat of bonding grout brushed into the surface. Prepare grout of one part cement to one part fine sand passing a No. 30 sieve and to the consistency of thick cream.

D. Patching Mortar

1. Make the patching mortar of the same materials and of approximately the same proportions used for the concrete, except omit the coarse aggregate and make the mortar of not more than one (1) part of cement to two and one-half (2.5) parts sand by damp loose volume. Add no more mixing water than necessary for handling and placing. Mix the patching mortar in advance to allow to stand with frequent manipulation with a trowel, without the addition of water, until it has achieved the stiffest consistency that will permit placing.

E. Placing Patching Mortar

1. After the bonding grout begins to lose its water sheen, apply the patching mortar. Thoroughly consolidate patching mortar into place and strike off so as to leave the patch slightly higher than the surrounding surface. Leave undisturbed for one (1) hour to permit initial shrinkage and then finish.

F. Accomplish all repairs in such a manner that the completed surface will conform to the finish requirements of the specification using methods that will not disturb the bond or cause sagging or horizontal fractures. Provide surfaces of said repairs with the same din and amount of curing treatment as required for the concrete in the unrepaired section.

G. Tie Holes

1. After being cleaned and thoroughly dampened, fill the tie holes solid with patching mortar.

H. Temperature and Shrinkage Cracks

1. Repair temperature and shrinkage cracks which develop prior to final acceptance of the work.

I. Major Defective Areas

1. If the defects are serious or affect the strength of the structure, or if patching does not satisfactorily restore the quality and appearance to the surface, the Owner's representative may require the concrete to be removed and replaced complete in accordance with the provisions of this section. This shall be done at no additional cost to the Owner.

3.11 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required levels and lines, details, and elevations.
- B. Repair or replace concrete not properly placed or of the specified type.

3.12 FIELD QUALITY CONCRETE

- A. Field inspection and testing will be performed in accordance with Section 01400, Testing and Inspection.
- B. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.13 PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. During curing period, protect concrete from damaging mechanical disturbances, water flow, loading, shock, and vibration.

3.14 CLEAN-UP

- A. Remove debris and excess material immediately from project site.
- B. Take down barricades and temporary traffic markers, signals, and signs only after work included in this section is finished and inspected.
- C. Leave project area neat, orderly, and free of any hazardous conditions.

END OF SECTION

SECTION 02934

SODDING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall provide all labor, materials, and equipment necessary for complete sodding of areas affected by construction. This shall include, but not be limited to, liming, fertilizing, sodding, necessary barriers, tests, and all incidentals to make the Work complete.

1.02 WORK INCLUDED

- A. Testing of topsoil
- B. Raking and leveling of topsoil as required for sodding
- C. Liming and fertilizing of topsoil
- D. Laying and rolling of sod
- E. Maintaining sod

1.03 SUBMITTALS

- A. Submit product source and information sheets in accordance with Section 01300 entitled "Submittals".

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Fertilizer
 - 1. Fertilizer shall be commercial fertilizer as manufactured by International Chemical Company, or approved equal.
 - 2. Said fertilizer shall have a 10-20-6 N.P.K. content and contain a minimum of 60 percent of organic material.
 - 3. Fertilizer shall be delivered at the site in the original sealed containers.

- B. Sod

1. All sod that is removed or damaged due to the Contractor's Work shall be replaced with the same as was removed or damaged unless otherwise noted on the drawings.
2. The sod shall be as grown by a certified turf nursery, and Contractor shall inform the Owner as to the source of the sod to be utilized prior to ordering and delivery of sod.
3. Floratam St. Augustine turf will be classified as "Number 1/Premium" turf grass per industry standards.
4. Floratam St. Augustine deliveries shall have a "cut sheet" on company letterhead specifying date, field, and time of harvest.
5. Floratam St. Augustine will be machine cut to a uniform soil thickness of approximately 1.5 inches, plus or minus 0.25 inches at the time of harvesting.
6. Floratam St. Augustine shall be mowed to a height of 2 to 3 inches before harvesting.
7. Floratam St. Augustine shall be strong enough so each section can be picked up and handled without damaging turf pieces.
8. Cutting dimensions will be 16 inch x 24 inch slabs or 48inch x 70 feet long roll.
9. Installation should be completed within 6 hours of delivery.
10. Bahia grass turf shall be free of disease, nematodes, and soil borne insects and shall be laid in uniform sized sections. Clumps of Bahia will not be accepted.
11. After the preparation of the areas to be sodded, supply and install sod which is equal to or approved as equal to sod which existed prior to construction. As a minimum, Type No. 1 sod composed of grasses grown from a Bahia Seed mixture shall be used for stabilization of final grade.
12. All sod installed on slopes/banks shall be pinned in place immediately upon installation.

PART 3 -- EXECUTION

3.01 INSTALLATION

- A. These areas shall be fine graded to achieve the finished subgrade after compaction which shall be obtained by rolling, dragging, or by an approved method which obtains an equivalent compaction to that produced by a hand roller weighing from 75 to 100 pounds per foot of width. All depressions caused by settlement or rolling shall be filled with additional existing or furnished topsoil and regraded and prepared as specified above until it presents a reasonably smooth and even finish at the required sod sub-grade.
- B. All sod furnished shall be living sod containing at least 70 percent of thickly matter grasses as specified and shall be free from noxious weeds, disease and insects.

- C. No broken pads or torn or uneven ends will be accepted. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section. Sod shall not be harvested when its moisture content (excessively wet or dry) may adversely affect its survival.
- D. Sod shall be harvested and delivered within a period of 36 hours. Sod shall be installed within 6 hours of delivery. Sod not harvested, delivered and/or installed within these time frames shall be subject to inspection and rejection by Owner or Engineer and shall be removed from the site. A fresh sod supply shall then be furnished at no extra cost to Owner.
- E. The topsoil shall not be moist at time of installation; however, it shall contain sufficient moisture so as not be powdery or dusty, both as determined by the supplier's representative.
- F. The overlapping of existing lawn with new sod along limit of work lines will not be permitted. Sod shall be laid in strips, edge to edge, with the lateral joints staggered. All minor or unavoidable openings in the sod shall be closed with sod plugs or with topsoil, as directed by Owner or Engineer. However, sod laid with joints determined to be too large shall be lifted and relaid as specified herein at no extra cost to Owner.
- G. Immediately after the sod is laid, the sod shall be watered thoroughly by hand or mechanical sprinkling until the sod and at least 2 inches of the top soil bed has been thoroughly moistened. Watering shall continue on a routine basis as needed to establish sod.
- H. Contractor shall be responsible to furnish his own supply of water to the site at no extra cost. If possible, Owner shall furnish Contractor, upon request, with a source and supply of water. Contractor shall pay for and obtain a temporary construction meter. Owner will pay for water, if it is available from Owner's system. If Owner's water supply is not available or not functioning, Contractor shall be responsible to furnish adequate supplies at his own cost. All work injured or damaged due to the lack of, or the use of too much water, shall be Contractor's responsibility to correct.

3.02 MAINTENANCE

- A. Maintain the entire sodded areas until well established and up to final acceptance at the completion of the Contract. Final completion will not be granted until sod is well established. Maintenance shall include watering as specified, weeding, and removal of stones which may appear. All bare or dead spots which become apparent shall be properly prepared, limed, fertilized, and resodded at Contractor's expense as many times as necessary to secure a good growth. In the event that the sod installation is not accepted by Owner, contractor shall replace sod at his own expense. Sodded areas shall be maintained and cut by Contractor until final acceptance of the project.
- B. Contractor shall take whatever measures are necessary to protect the sod while it is developing. These measures shall include furnishing of warning signs, barriers, or any other necessary measures of protection.

- END OF SECTION -

SECTION 15000

PIPING, GENERAL

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish and install all piping systems shown and specified, in accordance with the requirements of the Contract Documents. Each system shall be complete with all necessary fittings, hangers, supports, anchors, expansion joints, flexible connectors, valves, accessories, lining and coating, testing, disinfection, excavation, and backfill, to provide a functional installation.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300 - Submittals
- B. Section 02222 - Excavation and Backfill for Utilities
- C. Section 15995 - Pipeline Testing and Disinfection

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards

- | | | |
|----|---------------|---|
| 1. | ANSI B16.1 | Cast Iron Pipe Flanges and Flanged Fittings, Class 125. |
| 2. | ANSI B16.5 | Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and other Special Alloys. |
| 3. | ANSI/AWS D1.1 | Structural Welding Code. |
| 4. | ASTM A307 | Specification for Carbon Steel Externally Threaded Standard Fasteners. |
| 5. | ASTM A325 | Specification for High Strength Bolts for Structural Steel Joints. |
| 6. | ASTM D792 | Test Methods for Specific Gravity and Density of Plastics by Displacement. |

1.04 CONTRACTOR SUBMITTALS

- A. The Contractor shall submit complete shop drawings and certificates, test reports, affidavits of compliance, of all piping systems, in accordance with the requirements in Section 01300 - Submittals, and as specified in the individual piping sections.
- B. Each shop drawing submittal shall be complete in all aspects incorporating all information and data listed herein and all additional information required to evaluate the proposed piping

material's compliance with the Contract Documents. Partial or incomplete submissions will be returned to the Contractor without review.

C. Data to be submitted shall include, but not be limited to:

1. Catalog Data consisting of specifications, illustrations and a parts schedule that identifies the materials to be used for the various piping components and accessories. The illustrations shall be in sufficient detail to serve as a guide for assembly and disassembly.
2. Complete layout and installation drawings with clearly marked dimensions and elevations. Piece numbers which are coordinated with the tabulated pipe layout schedule shall be clearly marked. Piping layout drawings shall indicate the following additional information; pipe supports, location, support type, hanger rod size, insert type and the load on the hanger in pounds.
3. Weight of all component parts.
4. Design calculations when requested.
5. Tabulated pipe layout schedule which shall include the following information for all pipe and fittings: service, pipe size, working pressure, wall thickness and piece number.

D. Certifications

1. Prior to installation, the Contractor shall furnish an Affidavit of Compliance certified by the pipe manufacturer that the pipe, fittings and specials furnished under this Contract comply with all applicable provisions of AWWA and these specifications. No pipe or fittings will be accepted for use in the Work on this project until the affidavits have been submitted and accepted in accordance with Section 01300 - Submittals.

E. All expenses incurred in making samples for certification of tests shall be borne by the Contractor.

1.05 QUALITY ASSURANCE

A. Tests

1. Except where otherwise specified, all materials used in the manufacture of the pipe shall be tested in accordance with the applicable Specifications and Standards.

B. Welding Requirements

1. All welding procedures used to fabricate pipe shall be prequalified under the provisions of ANSI/AWS D1.1. Welding procedures shall be required for, but not necessarily limited to, longitudinal and girth or spiral welds for pipe cylinders, spigot and bell ring attachments, reinforcing plates and ring flange welds, and plates for lug connections.

C. Welder Qualifications

1. All welding shall be done by skilled welders, welding operators, and tackers who have had adequate experience in the methods and materials to be used. Welders shall be qualified under the provisions of ANSI/AWS D1.1 by an independent local, acceptable testing agency not more than 12 months prior to commencing work. Machines and electrodes similar to those used in the Work shall be used in qualification tests. The Contractor shall furnish all material and bear the expense of qualifying welders. Furnish welder's qualification papers to the Owner.

1.06 MANUFACTURER'S SERVICE REPRESENTATIVE

- A. Where the assistance of a manufacturer's service representative is advisable, in order to obtain correct pipe joints, supports, or special connections, the Contractor shall furnish such assistance at no additional cost to the Owner.

1.07 MATERIAL DELIVERY, STORAGE, AND PROTECTION

- A. All piping materials, fittings, valves, and accessories shall be delivered in a clean and undamaged condition and stored off the ground, to provide protection against oxidation caused by ground contact. All defective or damaged materials shall be replaced with new materials.

1.08 CLEANUP

- A. After completion of the work, all remaining pipe cuttings, joining and wrapping materials, and other scattered debris, shall be removed from the site. The entire piping system shall be handed over in a clean and functional condition.

PART 2 -- PRODUCTS

2.01 GENERAL

- A. All pipes, fittings, and appurtenances shall be installed in accordance with the requirements of the applicable Sections of Division 2 and 15 and furnished as specified herein.

B. Lining

1. All requirements pertaining to thickness, application, and curing of pipe lining, shall be in accordance with the requirements of the applicable Sections of Division 15, unless otherwise specified.

C. Coating

1. All requirements pertaining to thickness, applications, and curing of pipe coating, are in accordance with the requirements of the applicable Sections of Division 15, unless otherwise specified. Pipes above ground or in structures shall be field-painted in accordance with the Section entitled "Painting."

2.02 SLEEVE-TYPE COUPLINGS

A. Construction

1. Sleeve-type couplings shall be provided where shown, and shall be of similar material as the pipe, without pipe stop, and shall be of sizes to fit the pipe and fittings shown. The middle ring shall be not less than 1/4-inch in thickness and shall be either 5 or 7-inches long for standard steel couplings, and 16-inches long for long-sleeve couplings. The followers shall be single-piece contoured mill section welded and cold-expanded as required for the middle rings. They shall be of sufficient strength to accommodate the number of bolts necessary to obtain adequate gasket pressures without excessive rolling. The shape of the follower shall be of such design as to provide positive confinement of the gasket. Bolts and nuts shall conform to the requirements of Article 3.08, "Thrust Restraint".

B. Pipe Preparation

1. The ends of the pipe, where specified or shown, shall be prepared for sleeve-type couplings. Plain ends for use with couplings shall be smooth and round for a distance of 12-inches from the ends of the pipe, with outside diameter not more than 1/64-inch smaller than the nominal outside diameter of the pipe. The middle ring shall be tested by cold-expanding a minimum of one percent beyond the yield point, to proof-test the weld to the strength of the parent metal. The weld of the middle ring shall be subjected to an air test for porosity.

C. Gaskets

1. Gaskets for sleeve-type couplings shall be rubber-compound material that will not deteriorate from age or exposure to air under normal storage or use conditions. The rubber in the gasket shall meet the following specifications:
 - a. Color - Jet Black.
 - b. Surface - Nonblooming.
 - c. Durometer Hardness - 74 ± 5 .
 - d. Tensile Strength - 1000 psi Minimum.
 - e. Elongation - 175 percent Minimum.

- D. The gaskets shall be immune to attack by the material which is being transported. All gaskets shall meet the requirements of ASTM D2000, AA709Z, meeting Suffix B13 Grade 3, except as noted above.

E. Insulating Couplings

1. Where insulating couplings are required, both ends of the coupling shall have a wedge-shaped gasket which assembles over a rubber sleeve of an insulating compound in order to obtain insulation of all coupling metal parts from the pipe.

F. Restrained Joints

1. Where harnesses are required for sleeve-type couplings, they shall be in accordance with the requirements of the appropriate reference standard, or as shown.

PART 3 -- EXECUTION

3.01 GENERAL

- A. The Contractor shall furnish all labor, tools, materials, and equipment necessary for installation and jointing of the pipe. All piping shall be installed in accordance with the Drawings in a neat workmanlike manner and shall be set for accurate line and elevation. All piping shall be thoroughly cleaned before installation, and care shall be taken to keep the piping clean throughout the installation.
- B. Before setting wall sleeves, pipes, castings and pipes to be cast in place, the Contractor shall check the Drawings and equipment manufacturer's drawings which may have a direct bearing on the pipe locations. The Contractor shall verify existing piping tie-in connections and verify size, type, and location before fabricating new piping assemblies.
- C. Piping shall be attached to valves in accordance with the respective manufacturers' recommendations.
- D. All changes in directions or elevations shall be made with fittings, unless otherwise shown.

3.02 SHIPPING, HANDLING AND STORAGE

- A. Special care in handling shall be exercised during delivery, distribution and storage of pipe to avoid damage and setting up stresses. Damaged pipe will be rejected and shall be replaced at the Contractor's expense. Pipe and specials stored prior to use shall be stored in such a manner as to keep the interior free from dirt and foreign matter.
- B. No pipe shall be dropped from cars or trucks to the ground. All pipe shall be carefully lowered to the ground by mechanical means. In shipping, pipe and fittings shall be blocked in such manner as to prevent damage to castings or lining. Any broken or chipped lining shall be carefully patched. Where it is impossible to repair broken or damaged lining in pipe because of its size, the pipe shall be rejected as unfit for use.
- C. All mechanical joint pipe shall be laid with 1/8-inch space between the spigot and shoulder of pocket.

3.03 LAYING PIPE

- A. Proper and suitable tools and appliances for the safe convenient handling and laying of pipe shall be used and shall, in general, agree with manufacturer's recommendations. At the time of laying, the pipe shall be examined carefully for defects, and should any pipe be discovered to be defective after being laid, it shall be removed and replaced with sound pipe by the Contractor at his expense.

- B. The Contractor shall perform all earthwork including excavation, backfill, bedding, compaction, sheeting, shoring and bracing, dewatering and grading in accordance with Section 02222 - Excavation and Backfill for Utilities.
- C. Upon satisfactory excavation of the pipe trench and completion of the pipe bedding, a continuous trough for the pipe barrel and recesses for the pipe bells, or couplings, shall be excavated by hand digging. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall receive continuous, uniform support and no pressure shall be exerted on the pipe joints from the trench bottom.
- D. Pipe shall be installed in accordance with the manufacturer's recommendation. Before being lowered into the trench, the pipes and accessories shall be carefully examined and the interior of the pipes shall be thoroughly cleaned of all foreign matter. At the close of each work day and during suspension of work for any reason at any time, a suitable stopper shall be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe.
- E. Lines shall be laid straight and depth of cover shall be maintained uniform with respect to finish grade, whether grading is completed or proposed at time of pipe installation. Where a grade or slope is shown on the Drawings, the Contractor shall use laser based surveying instruments to maintain alignment and grade. At least one elevation shot shall be taken on each length of pipe and recorded. No abrupt changes in direction or grade will be allowed.
- F. After pipe has been laid, inspected and found satisfactory, sufficient backfill shall be placed along the pipe barrel to hold the pipe securely in place during the conduction of the hydrostatic test. No backfill shall be placed over the joints until the hydrostatic tests is satisfactorily completed, leaving the joints exposed to view for the detection of visible leaks. Upon satisfactory completion of the hydrostatic test, backfilling of the trench shall be completed. Pipe trenches may be backfilled prior to hydrostatic testing subject to the permission of the Owner.
- G. All underground piping and fittings shall use thrust restrained joints where indicated on the Contract Drawings.

3.04 THRUST RESTRAINT

- A. All sleeve type couplings shall be harnessed except where noted specifically on the Drawings. The harnessing shall be as shown on the Drawings or as specified herein.
- B. Where the distance between adjacent flanges is in excess of ten feet or where a harness can not be used, the pipe supports adjacent to the coupling shall restrain the piping preventing any linear or angular movement resulting in the pipe separating from the coupling or misalignment in the joint.
- C. Where expansion joints are used, control units shall be provided. All tie rods and control units shall be installed in accordance with to the manufacturer's recommended procedures.
- D. In general, all valves and fittings shall be restrained in an acceptable manner such that the unbalanced force developed at them shall be supported independent of the piping system.

- END OF SECTION -

SECTION 15009

PVC PRESSURE PIPE

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish and install 4-inch to 12-inch polyvinyl chloride (PVC) pressure pipeline, complete in place, all in accordance with the requirements of the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 15000 - Piping, General.
- B. Section 15995 - Pipeline Testing and Disinfection.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Commercial Standards

1. ANSI/AWWA C104/A21.5 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
2. ANSI/AWWA C110/A21.10 Ductile-iron and Gray-Iron Fittings 3-in. Through 48-in. for Water and Other Liquids
3. ANSI/AWWA C114/A21.11 Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
4. ANSI/AWWA C600 Installation of Ductile-Iron Water Mains and Appurtenances
5. ANSI/AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe 4-in. Through 12-in. for Water
6. ASTM D 2584 Test Method for Ignition Loss of Cured Reinforced Resins
7. PPI Technical Report Policies and Procedures for Developing
8. TR 3/4 Recommended Hydrostatic Design Stresses for Thermoplastic Pipe Materials
9. AWWA Manual M23 PVC Pipe - Design and Installation

1.04 SUBMITTALS

A. Shop Drawings

1. The Contractor shall submit shop drawings of pipe, fittings, and appurtenances in accordance with the requirements in Section entitled, "Submittals."

B. Certifications

1. The Contractor shall furnish a certified affidavit of compliance for all pipe and other products or materials furnished under this Section of the Specifications, as specified in the referenced standards.
2. All expenses incurred in making samples for certification of tests shall be borne by the Contractor.

1.05 QUALITY ASSURANCE

A. Tests

1. Except as modified herein, all materials used in the manufacture of the pipe shall be tested in accordance with the requirements of this Section of the Specifications, as specified in the referenced standards, as applicable.

- B. In addition to those tests specifically required, the Owner may request additional samples of any material for testing by the Owner. The additional samples shall be furnished at no additional cost to the Owner.

PART 2 -- PRODUCTS

2.01 GENERAL

- A. PVC pressure pipe (4-inch through 12-inch) shall conform to the applicable requirements of ANSI/AWWA C900 and subject to additional requirements specified herein.

2.02 PIPE

- A. The pipe shall be of the diameter and pressure class specified or shown, shall be furnished complete with rubber gaskets, and all specials and fittings shall be provided as required in the Contract Documents. The dimensions and pressure classes for Dimension Ratios for large PVC pressure pipe with Cast-Iron Pipe Equivalent O.D.'s shall conform to the requirements of AWWA C900. Wall thickness shall be a minimum of schedule 80, unless otherwise specified or noted on the Drawings.

B. Wall Thickness

1. The following design parameters shall be provided for all polyvinyl chloride (PVC) pipe.

<u>PIPE MATERIAL</u>	<u>NOMINAL PIPE DIAMETER (INCHES)</u>	<u>PRESSURE CLASS</u>	<u>DIMENSION RATIO DR</u>	<u>TYPE OF JOINT</u>
PVC	4 thru 12	235	18	RESTRAINED

2. Buried push-on, mechanical, and restrained joint pipe shall have a wall thickness class equal to or greater than the specified working pressure. Refer to pipe schedule for type of joint required for each type of service.

C. Additives and Fillers

1. Unless otherwise provided in alternate qualification procedures of PPI-TR3, compounds which have a Hydrostatic Design Basis (HDB) of 4000 psi at 73.4 degrees F for water shall not contain additives and fillers that exceed the recommended values in Table 1, Part Y of PPI-TR3 (e.g., allowable content range for calcium carbonate is 0.0-5.0 parts per hundred of resin). If requested by the Owner, the additive and filler content shall be determined using the pyrolysis method as specified in ASTM D 2584.

D. Joints

1. All joints for buried PVC pipe shall be either an integral bell manufactured on the pipe or a separate coupling both employing a rubber ring joint. The bell and coupling shall be the same thickness as of the pipe barrel, or greater thickness. The sealing ring groove in the coupling shall be of the same design as the groove in cast iron fittings and valves available from local water works supply distributors. Where required, joints shall be restrained using an approved joint restraint system as noted in the Towns' Guide for Development, Design and Construction Standards, Water and Stormwater.

E. Joint Deflection

1. Deflection at the joint shall not exceed 1.5 degrees or one half the maximum deflection recommended by the manufacturer. No deflection of the joint shall be allowed for joints which are overbelled or not belled to the stop mark.

2.03 FITTINGS

- A. All fittings shall be ductile iron and manufactured in accordance with ANSI A21.10 (AWWA C110) for nominal pipe sizes three inches to sixty-four inches, and shall be mechanical joint.
- B. Shall have a rated pressure equal to or greater than the specified working pressure for nominal pipe sized of three inches to sixty-four inches (350 psi fittings available through and including twenty-four inches, only). Fittings shall conform to the requirements of AWWA C110 and be restrained joint.

- C. All fittings shall be lined and coated in accordance with the requirements of Section entitled "Ductile Iron Pipe" and "Piping, General".
- D. Each fitting shall be clearly labeled to identify its size and pressure class.
- E. Mechanical joint restraint shall be incorporated in the design of the follower gland. The restraint mechanism shall consist of a plurality of individually activated gripping surfaces to maximize restraint capability. Glands shall be manufactured of ductile-iron conforming to ASTM A536-80. The gland shall be such that it can replace the standardized mechanical joint gland and can be used with the standardized mechanical joint bell conforming to ANSI/AWWA A21.11/C111 of latest revision. Twist-off nuts, sized same as tee-head bolts, shall be used to insure proper actuating of restraining devices. The restraining glands shall have a pressure rating equal to that of the PVC pipe on which it is used and shall be Megalug Series 2000 PV as manufactured by EBAA Iron Inc., or equal.

PART 3 -- EXECUTION

3.01 GENERAL

- A. All laying, jointing, and testing for defects and for leakage shall be performed in the presence of the Owner, and shall be subject to acceptance by the Owner. All material found during the progress to have defects will be rejected and the Contractor shall promptly remove such defective materials from the site of the work.
- B. Installation shall conform to the requirements of AWWA M23, instructions furnished by the pipe manufacturer, and to the supplementary requirements or modifications specified herein. Wherever the provisions of this Section and the aforementioned requirements are in conflict, the more stringent provision shall apply.

3.02 HANDLING AND STORAGE

A. Handling

- 1. Pipe, fittings and accessories shall be carefully inspected before and after installation and those found defective shall be rejected. Pipe and fittings shall be free from fins and burrs. Before being placed in position, pipe, fittings, and accessories shall be cleaned, and shall be maintained in a clean condition. Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall pipe, fittings or any other material be dropped or dumped into trenches.

B. Storage

- 1. Pipe should be stored, if possible at the job site in unit packages provided by the manufacturer. Caution should be exercised to avoid compression damage or deformation to bell ends of the pipe. Pipe should be stored in such a way as to prevent sagging or bending and protected from exposure to direct sunlight by covering with an opaque material while permitting adequate air circulation above

and around the pipe. Gaskets should be stored in a cool, dark place out of the direct rays of the sun, in the original packaging.

3.03 TRENCHING AND BACKFILL

- A. Trench excavation and backfill shall conform to the requirements of Section entitled "Excavation and Backfill for Utilities" and as specified herein.

3.04 INSTALLATION

- A. Bell-and-spigot pipe shall be laid with the bell end pointing in the direction of laying. Pipe shall be graded in straight lines, taking care to avoid the formation of any dips or low points. Pipe shall not be laid when the conditions of trench or weather are unsuitable. At the end of each days work, open ends of pipe shall be closed temporarily with wood blocks or bulkheads.
- B. Pipe shall be supported at its proper elevation and grade, care being taken to secure firm and uniform support. Wood support blocking will not be permitted. The full length of each section of pipe and fittings shall rest solidly on the pipe bed, with recessed excavation to accommodate bells, joints and couplings. Anchors and supports shall be provided where necessary and where indicated on the Drawings for fastening work into place. Fittings shall be independently supported.
- C. Short lengths of pipe shall be used in and out of each rigid joint or rigid structure. Piping that does not allow sufficient space for proper installation of jointing material shall be replaced by one of proper dimensions. Blocking or wedging between bells and spigots will not be permitted.
- D. Joints shall be installed according to manufacturer's recommendations. Trenches shall be kept free of water until joints have been properly made. The maximum combined deflection at any coupling shall be in accordance with the manufacturer's recommendations.
- E. Pipe shall be cut by means of saws, power driven abrasive wheels or pipe cutters, which will produce a square cut. No wedge-type roller cutters will be permitted. After cutting, the end of the pipe shall be beveled using a beveling tool, portable type sander or abrasive disc.

3.05 FIELD TESTING AND DISINFECTION

- A. Field testing and disinfection of water mains shall conform to the requirements of the Section entitled "Pipeline Testing and Disinfection."

- END OF SECTION -

SECTION 15020

HIGH DENSITY POLYETHYLENE PRESSURE PIPE

PART 1 – GENERAL

1.01 SECTION DESCRIPTION

- A. This Section includes the specifications for a particular type of pressure pipeline material, installation standards and Contractor responsibilities associated with the furnishing of all specified materials, equipment, labor and incidentals required to provide the required material and install the material in accordance to this and other related specifications.
- B. This Specification governs the material, pipe, fittings, heat fusion and general construction practice for HDPE pipe.

1.02 RELATED SECTIONS

- A. Section 02446, Horizontal Directional Drilling
- B. Section 15000, Piping, General
- C. Section 15009, PVC Pressure Pipe

1.03 QUALITY AND WORKMANSHIP

- A. The pipe and fitting manufacturer's production facilities shall be open for inspection by the Owner or his designated agents. During inspection, the manufacturer shall demonstrate that he has facilities capable of manufacturing the pipe and fittings required by this specification, that a quality control program meeting the minimum requirements of D3035, and ASTM F-714 is in use, and that facilities for performing the tests required by this specification are in use.
- B. The Engineer may request certification that the pipe produced is represented by the quality assurance data. Additionally, test results from the manufacturer's testing which show the pipe does not meet appropriate ASTM standards of manufacturer representation will be cause for rejection of the pipe represented by the testing. These tests may include density and flow rate measurements from samples taken at selected locations within the pipe wall and thermal stability determinations according to ASTM D-3350, 10.1.9.
- C. The Owner or the Engineer may request certified lab data from the manufacturer to verify the physical properties of the materials supplied under this specification or at his own expense may take random samples for testing by an independent laboratory.
- D. If an approved supplier must supply material that does not meet all requirements of this specification, he must notify the Engineer via a written description of the deviation with data that shows the magnitude of the deviation, the justification for the deviation from this specification, and the worse case, long term impact of the deviation on the project. The decision,

prior to shipment, to accept material deviating from this specification shall be the responsibility of the specifying Engineer.

- E. The Owner or the Engineer may request certified lab data to verify the physical properties of the compounded materials supplied under this specification, or have random samples tested by an independent laboratory. Such testing will be at expense of the party requiring verification testing. Requests for verification must be submitted in writing and mutually acceptable arrangements made.
- F. Polyethylene pipe and fittings may be rejected in whole or in part by the Engineer for failure to meet any of the requirements of this specification.

1.04 PIPE PACKAGING, HANDLING, STORAGE

- A. The manufacturer shall package the pipe in a manner designed to deliver the pipe to the project neatly, intact, and without physical damage. The transportation carrier shall use appropriate method and intermittent checks to ensure the pipe is properly supported, stacked, and restrained during transport such that the pipe is not nicked, gouged, or physically damaged.

PART 2 – PRODUCTS

2.01 MATERIAL

- A. Materials used for the manufacture of polyethylene pipe and fittings shall be very high molecular weight, high density ethylene/hexane copolymer PE 3408 polyethylene resin meeting the listed physical property and pipe performance requirements:
 - 1. The pipe shall be extruded from pre-compounded resin. In plant blending of resin is unacceptable.
 - 2. The pipe shall meet all requirements of AWWA C906, latest revision.
 - 3. The polyethylene pipe MANUFACTURER shall provide certification that stress regression testing has been performed on the specific product. Said certification shall include a stress life curve per ASTM D-2837. The stress regression testing shall have been done in accordance with ASTM D-2837, and the manufacturer shall provide a product supplying a minimum Hydrostatic Design Basis (HDB) of 1,600 psi, as determined in accordance with ASTM D-2837.
 - 4. Further, the material shall be listed by PPI (the Plastics Pipe Institute, a division of the Society of the Plastics Industry) in PPI TR-4 with a 73°F hydrostatic design stress rating of 800 psi, and a 140°F hydrostatic design stress rating of 400 psi. The PPI Listing shall be in the name of the pipe manufacturer, and shall be based on ASTM D-2837 and PPI TY-32 testing and validation of samples of the pipe manufacturer's production pipe.

5. The MANFUCATURER's certification shall state that the pipe was manufactured from one specific resin in compliance with these specifications. The certificate shall state the specific resin used, its source, and list its compliance to these specifications.

2.02 PIPE EXTRUSION

- A. The pipe shall be extruded using a melt homogenizing/plasticating extruder and "appropriate" die. The extruded screw design should be customized for the HDPE being processed to minimize melt fracture of the molecular structure thus reducing the molecular weight and changing some physical properties from resin to pipe. The resin should be processed at its melt temperature of 500°F to 525°F. The die will have an internally cooled mandrel and an externally cooled bushing. This die will cool the pipe to its solidification point such that it exits the die to specification size, shape and wall thickness with a polished surface for smooth flow offering a Hazen Williams "C" factor of C=155.

2.03 PIPE AND FITTINGS

A. Pipe

1. Pipe supplied under this specification shall have a nominal IUPS (Iron Pipe Size) OD unless otherwise specified. The SDR (Standard Dimension Ratio) and the pressure rating of the pipe supplied shall be as specified by the Engineer.
2. The pipe shall be produced with the nominal physical properties outlined in Part 2, and to the dimensions and tolerances specified in ASTM F-714. Additionally, the pipe shall be inspected per industry and accepted manufacturer standards for:
 - a. Diameter
 - b. Wall Thickness
 - c. Concentricity
 - d. Quick Burst Pressure and Ductility
 - e. Joint Length
 - f. Straightness
 - g. Quality
 - h. Toe-In
 - i. Overall Workmanship inspection on ID & OD
 - j. Print Line
3. The pipe shall contain no recycled compound except that generated in the Manufacturer's own plant from resin of the same specification from the same raw material. The pipe shall be homogenous throughout and free of visible cracks, holes, voids, foreign inclusions, or other deleterious defects, and shall be identical in color, density, melt index and other physical properties throughout.

B. Pipe Performance

1. The pipe shall be in compliance with the physical and performance requirements of Part 2.1 of this specification. Specifically, the pipe will be extruded from resin meeting specifications of ASTM D-3350 with a cell classification of PE: 355434C; and ASTM D-1248 pipe grade resin type III, Class C, Category 5, grade P34 polyethylene compound. The pipe shall exhibit the short term tensile and compressive physical properties listed in part 2.1, and the pipe shall provide the long term endurance characteristics recognized by the compressed pipe ring environmental stress crack resistance greater than 5000 hrs; the slow crack growth resistance greater than 32 days; the impact strength (toughness) greater than 144 in-lb/in notch; and rotary fatigue endurance at ± 1600 psi bending stress with $F > 100,000$ cycles.

C. Fittings

1. The standard HDPE fittings shall be standard commercial products manufactured by injection molding or by extrusion and machining or shall be fabricated from PE pipe conforming to this specification. The fittings shall be fabricated from PE pipe conforming to this specification. The fittings shall be fully pressure rated by the manufacturer to provide a working pressure equal to the pipe for 50 years service at 73.4°F with an included 2:1 safety factor. The fittings shall be manufactured from the same resin type, grade, and cell classification as the pipe itself. The manufacture of the fittings shall be in accordance with good commercial practice to provide fittings homogeneous throughout and free from cracks, holes, foreign inclusions, voids, or other injurious defects. The fitting shall be as uniform as commercially practicable in color, opacity, density and other physical properties. The minimum "quick-burst" strength of the fittings shall not be less than that of the pipe with which the fitting is to be used.

2.04 JOINING

- A. Sections of polyethylene pipe should be joined into continuous lengths on the jobs site above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements of 500°F, alignment and 150 psi interfacial fusion pressure.
- B. Butt fusion joining shall be 100% efficient offering a joint weld strength equal to or greater than the tensile strength of the pipe. Socket fusion shall not be used. Extrusion welding or hot gas welding of HDPE shall not be used for pressure pipe applications, nor in fabrications where shear or structural strength is important. Flanges, unions, grooved-couples, transition fittings and some mechanical couplers may be used to mechanically connect HDPE pipe without butt fusion. Connection method shall be approved by the Engineer. Refer to the manufacturer's recommendations.

2.05 PIPE MARKING

- A. During extrusion production, the HDPE pipe shall be continuously marked with durable printing following this format or an equal type format designating the same information:

1.	Nominal Size and OD Base	12" IPS
2.	Dimension Ratio	SDR 11
3.	Pressure Rating	160 psi
4.	Type	(Trade Name)
5.	AWWA Designation	AWWA C906
6.	Material Classification	PE3408
7.	Certification Bases	ASTM F714
8.	Pipe Test Category	C3
9.	Plant	P... for Pryor
10.	Extruder Number	#5
11.	Date	06 Oct 89
12.	Operator Number	55
13.	Shift Letter	A
14.	Resin Supplier Code	P
15.	NSF – PW	NSF – PW
16.	Four, Co-extruded color stripes	Blue

EXAMPLE: 12" IPS SDR 15.5 110psi (Trade Name) PE 3408
ASTM F-714 NSF-pw C3 P5 06FEB89 55A P

- B. Permanent identification of piping service shall be provided by co-extruding four equally spaced color stripes into the pipe outside surface. The striping material shall be the same as the pipe material, except color.
- C. Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pie. If the pipe must be stacked for storage, such stacking shall be done in accordance with the pipe manufacturer's recommendations. The handling of the pie shall be done in such a manner that it is not damaged by dragging over sharp objects or cut by chokers or lifting equipment.
- D. Sections of pipe having been discovered with cuts or gouges in excess of 10% of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using the butt fusion joining method.
- E. Fused segments of pipe shall be handles so as to avoid damage to the pipe. When lifting fused sections of pipe, chains or cable type chokers are not acceptable. Nylon slings are preferred. Spreader bars are recommended when lifting long fused sections. Care must be exercised to avoid cutting or gouging the pipe.

PART 3 – EXECUTION

3.01 MARKING BY MANUFACTURER

Special markings shall be plainly marked on the applicable pipe indicating the weight, class of pipe, casting period, manufacturer's mark and year pipe was produced.

3.02 FIELD TESTS

All tests shall be made in the presence of the TOJ unless waived in writing. The CONTRACTOR shall notify the TOJ in sufficient time when tests are being conducted to allow for travel time to the site.

3.03 HANDLING AND INSTALLATION

Pipe shall be placed along the route of construction in the direction of the flow. Pipe shall be placed where it will cause least interference with traffic by mechanical equipment. Before the pipe is butt-fused it shall be inspected and cleaned to ensure that no direct or foreign materials are in the finished line. All material handling shall be in strict conformance with the manufacturers written specifications. At no time will a chain be permitted to handle, install or lower the pipe into the trench. A nylon sling only will be permitted. Ground water shall be kept out of the pipe and the pipe kept closed by means of a test plug whenever work is not in progress. The CONTRACTOR shall provide the means for dewatering the trench and the cost thereof shall be included in the price for installing the watermain.

Deflections from a straight line or grade made necessary by field conditions shall not exceed the plans. Should the specified or required alignment require deflection in excess of those recommended by the manufacturer, the CONTRACTOR shall provide special bends as approved by the TOJ or a sufficient number of shorter lengths of pipe to provide deflections within the manufacturer's recommendations.

3.04 CONNECTION TO EXISTING WATERMAIN

The connections shall be made in a thorough and workmanlike manner, using proper specials and fittings to suit the actual conditions. The CONTRACTOR shall schedule his work so that digging and locating the existing fittings can be completed prior to starting trench work on the line. Tie-ins into lines shall be done at a time approved by the Jupiter Water Department. The CONTRACTOR shall verify the dimensions of all pipe before ordering special fittings and couplings.

3.05 FLUSHING/CLEANING

A minimum of 24 hour notice to the Jupiter Water System is required before flushing operations. All lines shall be flushed prior to conducting the pressure

test. Jupiter Water System personnel shall be present and in control during the flushing.

Flushing of lines will require a volume of water equal to 2-1/2 times the volume of the pipe line being flushed. Rate of flow during the flushing operation must be at least 5' per second. The contractor is responsible for providing a flushing point capable of discharging the flushing water into a safe location. Any erosion or other damage which may occur is the contractors responsibility.

3.06 PRESSURE TESTING

The CONTRACTOR shall furnish and install suitable temporary testing plugs or caps for the water line, all necessary pressure pumps, hose, pipe connections, meters, gauges and other similar equipment, and all labor required, all without additional compensation for conducting pressure and leakage tests and flushing of the new water lines.

Pressure testing equipment must be in good and proper operating condition. The test gauge shall be rated to 160 psig maximum with a reading in 2 psig increments oil glycerin, filled type have performed best, and exceptions should be approved prior to the test.

Hydrostatic pressure leak tests of PE pressure piping systems should be conducted in accordance with ASTM F 2164(8). The Contractor shall use clean water as the hydrostatic testing liquid.

Restraint –The pipeline test section must be restrained against movement in the event of catastrophic failure. Joints may be exposed for leakage examination provided that restraint is maintained.

The testing equipment capacity and the pipeline test section should be such that the test section can be pressurized and examined for leaks within test duration time limits.

Test equipment and the pipeline test section should be examined before pressure is applied to ensure that connections are tight, necessary restraints are in place and secure, and components that should be isolated or disconnected are isolated or disconnected. All low pressure filling lines and other items not subject to the test pressure should be disconnected or isolated.

The maximum allowable test pressure for a leak test duration of 8 hours or less is 150 psi at the lowest elevation in the section under test if accessible. Test pressure is temperature dependent and must be reduced at elevated temperatures.

The test section should be completely filled with the test liquid, taking care to bleed off any trapped air. Venting at high points may be required to purge air

pockets while the test section is filling. Venting may be provided by bleed valves or equipment vents.

The test procedure consists of initial expansion, and test phases. For the initial expansion phase, the test section is pressurized to test pressure plus 10 psi and make-up test liquid is added as required to maintain maximum test pressure for six (6) hours. For the test phase, the test pressure is reduced by 10 psi. This is the target test pressure (150 psi). If the pressure remains steady (within 4% of the target test pressure, 6 psi) for two hours, leakage is not indicated.

If leaks are discovered, depressurize the test section before repairing leaks. Correctly made fusion joints do not leak. *Leakage at a butt fusion joint may indicate imminent catastrophic rupture. Depressurize the test section immediately if butt fusion leakage is discovered.* Leaks at fusion joints require the fusion joint to be cut out and redone.

- If the pressure leak test is not completed due to leakage, equipment failure, etc., the test section should be de-pressurized and repairs made. Allow the test section to remain depressurized for at least eight (8) hours before retesting.

All leaks evident at the surface shall be uncovered and repaired regardless of the total leakage as indicated by the test, and all pipes, valves and fittings and other materials found defective under the test shall be removed and replaced at the CONTRACTOR's expense.

Should, in the judgement of the Town of Jupiter, it not be practical to follow the foregoing procedures exactly for any reason, modifications in the procedure shall be made as approved by the TOJ. In any event, the CONTRACTOR shall be responsible for the ultimate tightness of the watermain within the preceding requirements.

- END OF SECTION -

SECTION 15100

VALVES, GENERAL

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall provide all tools, supplies, materials, equipment, and labor necessary for furnishing, epoxy coating, installing, adjusting, and testing of all valves and appurtenant work, complete and operable, in accordance with the requirements of the Contract Documents. Where buried valves are shown, the Contractor shall furnish and install valve boxes to grade, with covers, extensions, and position indicators.
- B. The provisions of this Section shall apply to all valves and valve operators specified in the various Sections of these Specifications except where otherwise specified in the Contract Documents. Valves and operators in particular locations may require a combination of units, sensors, limit switches, and controls specified in other sections of these Specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 15000 - Piping, General

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Codes

- 1. All codes, as referenced herein, are specified in Section 01090 entitled "Reference Standards".

B. Commercial Standards

- 1. ANSI B16.1 Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.
- 2. ANSI B16.5 Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys.
- 3. ANSI/ASME B1.20.1 General Purpose Pipe Threads (Inch).
- 4. ANSI/ASME B31.1 Power Piping.
- 5. ASTM A36 Specification for Structural Steel.
- 6. ASTM A48 Specification for Gray Iron Castings.
- 7. ASTM A126 Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

- | | | |
|-----|----------------|---|
| 8. | ASTM A536 | Specification for Ductile Iron Castings. |
| 9. | ASTM B61 | Specification for Steam or Valve Bronze Castings. |
| 10. | ASTM B62 | Specification for Composition Bronze or Ounce Metal Castings. |
| 11. | ASTM B148 | Specification for Aluminum-Bronze Castings. |
| 12. | ASTM B584 | Specification for Copper Alloy Sand Castings for General Applications. |
| 13. | ANSI/AWWA C500 | Gate Valves for Water and Sewerage Systems. |
| 14. | ANSI/AWWA C504 | Rubber-Seated Butterfly Valves. |
| 15. | AWWA C508 | Swing-Check Valves for Waterworks Service, 2 Inches Through 24 Inches NPS. |
| 16. | ANSI/AWWA C509 | Resilient-Seated Gate Valves, 3 Through 12 NPS, for Water and Sewage Systems. |
| 17. | AWWA C550 | Protective Interior Coatings for Valves and Hydrants. |

1.04 SUBMITTALS

- A. Shop drawings of all valves and operators including associated wiring diagrams and electrical data, shall be furnished as specified in the Section 01300 - Submittals.
- B. Data to be submitted shall include but not be limited to:
 - 1. Catalog Data consisting of specifications, illustrations and a parts schedule that identifies the materials to be used for various parts and accessories. The illustrations shall be in sufficient detail to serve as a guide for assembly and disassembly.
 - 2. Complete assembly, and installation drawings with clearly marked dimensions. This information shall be in sufficient detail to serve as a guide for assembly and disassembly and for ordering parts.
 - 3. Weight of all component parts and assembled weight.
 - 4. Listing of all lubricants required for the equipment.
 - 5. Spare parts and special tools.
- C. The Contractor shall obtain from the manufacturer and submit to the Owner copies of the results of all certified shop tests.
- D. The Contractor shall submit a schedule of valves to be labeled indicating in each case the valve location and the proposed wording for the label.

- E. The Contractor shall submit operation and maintenance manuals in accordance with the procedures and requirements set forth in the General Conditions and Division 1.
- 1.05 TOOLS, SUPPLIES AND SPARE PARTS
- A. The Contractor shall obtain from the equipment manufacturer and submit to the Owner the following spare parts lists in accordance with the procedures and requirements set forth in the General Conditions and Division 1.
 - 1. A complete list of parts and supplies with source of supply.
 - 2. A list of parts and supplies that are either normally furnished at no extra costs with the purchase of the valve as specified herein to be furnished as part of the Contract. (This list shall be submitted as part of the shop drawing submission).
 - B. Parts shall be completely identified with a numerical system to facilitate parts inventory control and stocking. Each part shall be properly identified by a separate number. Those parts which are identical for more than one size, shall have the same parts number.
 - C. The Contractor shall also compile from the shop drawing submittals and furnish a comprehensive list of all special tools required for the equipment.
- 1.06 QUALITY ASSURANCE
- A. Unless otherwise specified, each valve body shall be tested under a test pressure equal to twice its design water-working pressure.
 - B. Unless otherwise specified, all interior bronze parts of valves shall conform to the requirements of ASTM B62, or, where not subject to dezincification, to ASTM B584.

PART 2 -- PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. The Contractor shall furnish all valves, gates, valve-operating units, stem extensions, and other accessories as shown on the Drawings or as specified herein. All valves and gates shall be new and of current manufacture.
- B. All shut-off valves, 6-inch and larger, shall have operators with position indicators. Where buried, these valves shall be provided with valve boxes and covers containing position indicators, and valve extensions.
- C. All valves shall have a minimum design pressure rating of 150 psi and capable of a test pressure of 300 psi. For service applications with pressures in excess of 150 psi, valves shall have a minimum pressure rating in excess of the service application working pressure.
- D. Cast iron parts of valves shall meet the requirements of ASTM A126, "Standard Specifications for Grey Iron Castings for Valves, Flanges and Pipe Fittings, Class 'B'." Flanged ends shall be flat-faced and have bolt circle and bolt patterns conforming to ANSI B16.1 Class 125 unless otherwise specified hereinafter.

- E. All castings shall be clean and sound, without defects of any kind and no plugging, welding or repairing of defects will be permitted. All bolt heads and nuts shall be hexagonal conforming to ANSI B18.2. Gaskets shall be full face and made of natural or synthetic elastomers in conformance with ANSI B16.21 suitable for the service characteristics, especially chemical compatibility and temperature. Nonferrous alloys of various types shall be used for parts of valves as specified. Where no definite specification is given, the material shall be the recognized acceptable standard for that particular application.
- F. The flanges of valves shall be in accordance with Section 15000 - Piping, General.
- G. Where subject to dezincification, gate valve stems shall be of bronze to ASTM B62, containing not more than 5 percent of zinc nor more than 2 percent of aluminum. Where dezincification is not a problem, bronze to ASTM B584 may be used. Valve stems shall have a minimum tensile strength of 60,000 psi, a minimum yield strength of 40,000 psi, and an elongation of at least 10 percent in 2 inches, as determined by a test coupon poured from the same ladle from which the valve stems to be furnished are poured.
- H. A label shall be provided on all shut-off valves exclusive of hose bibbs and chlorine cylinder valves. The label shall be of 1/16-inch plastic or stainless steel, minimum 2 inches by 4 inches in size, and shall be permanently attached to the valve or on the wall adjacent to the valve or as indicated by the Owner.
- I. All valves which are dead ends for active pipelines shall be provided with blind flanges or plugs to prevent leakage

2.02 BURIED VALVES

- A. Buried service valves shall have mechanical joint pipe ends.
- B. All buried valves shall be provided with cast-iron valve boxes unless otherwise indicated. The boxes shall be asphalt varnished, or enameled cast iron, adjustable to grade, and installed perpendicularly, centered around and covering the upper portions of the valve or valve operator, or the pipe. The top of each valve box shall be placed flush with finish grade unless otherwise indicated on the Drawings. Valve boxes shall be as specified elsewhere in this section.
- C. All buried valves and other valves located below the concrete operating deck or level, specified or noted to be key operated, shall have an operator shaft extension from the valve or valve operator to finish grade or deck level, a 2-inch square AWWA operating nut, and cover or box and cover, as may be required.

2.03 OPERATORS, GENERAL

- A. Valves and gates shall be furnished with operators, provided by the valve or gate manufacturer. All operators of a given type shall be furnished by the same manufacturer. All valve operators, regardless of type, shall be installed, adjusted, and tested by the valve manufacturer at the manufacturing plant. Operator orientation shall be verified with the Owner prior to installation. If this requirement is not met, changes to orientation shall be made at no additional cost.

- B. All operators, unless otherwise specified, shall turn counter- clockwise to open. Operators shall have the open direction clearly and permanently marked. All valve operators, manual, electric and pneumatic, shall be provided with the valve by the valve manufacturer. The Contractor, through the valve manufacturer, shall be solely responsible for the selection of the proper operator to meet the operating conditions specified herein. Field calibration and testing of the operators and valves to ensure a proper installation and an operating system shall be the responsibility of the Contractor.
- C. All manual operators shall have levers or handwheels, unless otherwise shown. Where buried, the valves shall have extensions with square nuts or floor stands. Valves mounted higher than 6 feet above floor or operating level shall have chain operators. Chains shall extend to within three (3) feet from operating floor. Unless otherwise shown or specified, valves of sizes 4-inch and larger shall have gear-assisted operators. Valves over five (5) feet to center line shall be rolled toward the operating side to make the handwheel or wrench more accessible.
- D. Operation of valves and gates shall be designed so that the effort required to operate the handwheel, lever or chain shall not exceed 40 pounds applied at the extremity of the wheel or lever. The handwheels on valves 14 inches and smaller shall not be less than 8 inches in diameter, and on valves larger than 14 inches the handwheel shall not be less than 12 inches in diameter.

2.04 VALVE BOXES

- A. Valve boxes shall be of the adjustable telescope type (adjustable to 6-inches up or down from the nominal required cover of the pipe), cast iron, and suitable to withstand heavy traffic loads. Valve boxes shall be three-piece, Tyler series 6860 with a #6 base section, and the cover shall have the word "WATER" cast thereon. Minimum shaft diameter shall be 5-1/4 inch and minimum metal thickness shall be 3/16-inch. Boxes shall be coated with a bitumastic coating.
- B. Valves shall be provided with extension stems to bring the operating nut to within 18-inches of the finished grade. Two (2) operating "T" wrenches suitable for use with the AWWA operating nut shall be provided.

PART 3 -- EXECUTION

3.01 INSTALLATION

- A. All valves, gates, operating units, stem extensions, valve boxes, and accessories shall be installed in accordance with the manufacturer's written instructions and as shown and specified.
- B. All valves shall be installed to provide easy access for operation, removal, and maintenance and to avoid conflicts between valve operators and structural members or handrails.
- C. Valve boxes shall be installed on firmly compacted material at a level approximately equal to the elevation of the valve packing plate. No contact between the valve and the box shall be permitted. For plug valves, the positioner on the operating mechanism shall be kept free of rocks, debris, etc.

- D. Where combinations of valves, sensors, switches, and controls are specified or shown on the drawings, it shall be the responsibility of the Contractor to properly assemble and install these various items so that all systems are compatible and operating properly. The relationship between interrelated items shall be clearly noted on shop drawing submittals.

3.02 PAINTING AND COATINGS

- A. The exterior and interior of butterfly, gate or tapping valves shall be coated and lined with fusion bonded epoxy or a protective epoxy that conforms to the latest edition of AWWA C550.

3.03 TESTING

- A. All valves shall be hydrostatically field tested at the specified pipeline test pressures specified in the piping sections. Any leakage or "sweating" of joints shall be stopped and all joints shall be tight. All motor operated and cylinder operated valves shall be tested for control operation as directed by the Owner. All valves shall be operated at the specified operating pressures.
- B. Testing shall be performed in accordance with the specifications and the ANSI and/or AWWA standards contained herein including leakage tests. Copies of the certified test results shall be provided by the manufacturer to the Contractor and submitted in accordance with Section 01300 - Submittals.

- END OF SECTION -

SECTION 15108

GATE VALVES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish and install gate valves, complete and operable, as shown and specified herein, including manual, electric, hydraulic, and pneumatic operators, epoxy coating, control units, and appurtenant work, all in accordance with the requirements of the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 15100 - Valves, General.

PART 2 -- PRODUCTS

2.01 GENERAL

- A. All buried valves shall be of the inside screw type. Valves shall be capable of being repacked under line pressure. Valves 14-inch and larger installed in vertical pipes with their stems horizontal shall be fitted with bronze slides, tracks, rollers, and scrapers to assist the travel of the gate assembly. Quick opening valves shall have quick opening levers and cams in lieu of handwheel operators.

2.02 RESILIENT-SEATED GATE VALVES

- A. Resilient-seated gate valves conforming to ANSI/AWWA C509 shall be provided. Resilient-seated gate valves shall have cast iron bodies with flanged, bell, or mechanical joint ends, rubber-coated cast iron disc, flanged bonnet, bronze stem, O-ring seals, and operators with handwheel or square nut, unless otherwise shown. Bonnet nuts and bolts shall be 316 SS material.
- B. Resilient-seated gate valves shall be U.S. Pipe "Metroseal" or equal.

2.03 TAPPING VALVES

- A. Tapping valves shall be epoxy coated and resilient seat mechanical joint. Manufacturer shall be in accordance with Town of Jupiter standard specifications.
- B. Suppliers, or Equal
 - 1. M&H
 - 2. Mueller
 - 3. Kennedy

PART 3 -- EXECUTION

3.01 GENERAL

- A. All gate valves shall be installed in accordance with AWWA Standards and the Supplier's printed recommendations, and in accordance with the applicable provisions of Section 15100 entitled "Valves, General".
- B. The exterior and interior of all valves shall be coated and lined as specified in Section 15006 entitled "Ductile Iron Pipe".

- END OF SECTION -*

SECTION 15995

PIPELINE TESTING AND DISINFECTION

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall perform flushing and testing of all pipelines and appurtenant piping, complete, including conveyance of test water from Owner-designated source to point of use and all disposal thereof, all in accordance with the requirements of the Contract Documents.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Commercial Standards:

ANSI/AWWA C600 Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.

ANSI/AWWA C651 Disinfecting Watermains

1.03 SUBMITTALS

- A. A testing schedule, including proposed plans for water conveyance, control, and disposal shall be submitted in writing for approval a minimum of seven days before testing is to start.

PART 2 -- PRODUCTS

2.01 MATERIALS REQUIREMENTS

- A. All test equipment, temporary valves or bulkheads, temporary vents or drains or other water control equipment and materials shall be determined and furnished by the Contractor subject to the Owner's review. No materials shall be used which would be injurious to the construction or its future function.

PART 3 -- EXECUTION

3.01 GENERAL

- A. Unless otherwise provided herein, water for testing pipelines will be furnished by the Owner; however, the Contractor shall make all necessary provisions for conveying the water from the Owner-designated source to the points of use.
- B. All pressure pipelines shall be tested. All testing operations shall be performed in the presence of the Owner.

3.02 PIGGING AND FLUSHING

- A. Preliminary as-builts are required prior to requesting a flush. A minimum of 48 hours notice to the Jupiter Utilities is required before flushing operations.
- B. All lines shall be flushed prior to conducting the pressure test. Jupiter Utilities personnel shall be present and in control of the flushing. Contractors are not authorized to operate any Jupiter Utilities valves.
- C. Contractor shall tap the existing 10-inch DIP water main with a saddle tap in accordance with the Town of Jupiter's Utilities Construction Standards and details Drawing No. W-30. Contractor shall install a jumper and a back flow preventer device along U.S.1 in order to provide a water source for bacteriological testing.
- D. The pigging and flushing process shall utilized full pipe flush from the 10" transmission main along U.S.1 on one side of Lake Worth Creek with the discharge point at the tie-in location on the opposite side of Lake Worth Creek. Only the Town of Jupiter Utilities personnel may open and close the valves which will be utilized for pigging and flushing only.
- E. Contractor shall be responsible for providing temporary piping as necessary to launch and retrieve the pig and for the discharge and disposal of flush water.
- F. Contractor shall be responsible to pay for and obtain a hydrant meter for construction purposes from the Town of Jupiter Utilities Department. Contractor shall be responsible for protection of the meter during construction. Contractor will not be charged for water used unless Owner determines that Contractor is being wasteful with his use of water.
- G. Contractor shall provide a stilling basin along U.S.1 to contain all pigging, flushing and dewatering water. Direct discharge into Lake Worth Creek or the intracoastal waterway is not acceptable.
- H. Contractor shall meet all pigging requirements as required by the Florida Administrative Code, the South Florida Water Management District and any other agencies having jurisdiction.
- I. All water utilized for pigging, flushing, pressure and leakage tests shall be potable water with an adequate chlorine residual of 0.5 mg/L combined residual.
- J. Flushing of lines shall require a volume of water equal to 2 1/2 times the volume of the pipeline being flushed. Rate of flow during the flushing operation shall be at least 5 feet per second.
- K. The Contractor is responsible for providing a flushing point capable of discharging the flushing water into a safe location. Any erosion or other damage which may occur is the Contractor's responsibility.

3.03 HYDROSTATIC TESTING OF PIPING

A. PRESSURE TESTING

- 1. The Contractor shall request witnessing of all pressure tests and provide a minimum

- of 48 hours notice to the Town of Jupiter Utilities.
2. Jupiter Utilities personnel shall be present during all pressure tests.
 3. The Contractor shall perform a preliminary test prior to call Jupiter Utilities for an official test.
 4. All pressure testing equipment shall be in good and proper operating condition. The test gauge shall be rated to 160 psi maximum with a reading in 2 psi increments. Oil glycerin filled type gauges are required; however, exceptions may be approved prior to the test at the sole discretion of the Owner's Inspector.
 5. Joints, fittings and thrusts shall be exposed during the pressure test. Main line valves and valve boxes shall be clean and accessible at this time and maintained in acceptable condition until system gets released by the Palm Beach County Health Department.
 6. The maximum length of line to be tested as one section shall be 2,500 feet. Various designs may require sectioning for pressure testing. The test shall be performed as determined in the current AWWA and Jupiter Utilities Specifications. The standard test duration is two (2) hours.
 7. The test procedure consists of initial expansion and test phases. For the initial expansion phase, the test section is pressurized to test pressure plus 10 psi and make-up test liquid is added as required to maintain maximum test pressure for six (6) hours. For the test phase, the test pressure is reduced by 10 psi; this is the target test pressure (150 psi). If the pressure remains steady (within 4% of the target test pressure, 6 psi) for two hours, leakage is not indicated.
 8. During pressure testing, the maximum deviation of pressure shall not exceed 6 psi. If the pressure deviation exceeds 6 psi, the test has failed.
 9. All tapping sleeves shall be pressure tested at 150 psi for one (1) hour with Jupiter Utilities personnel. Any loss of pressure is considered a failure. All tapped coupons shall be given to the Jupiter Utilities Inspector. A minimum of 48 hours notice to the Town of Jupiter Utilities is required prior to all such testing.

3.04 BACTERIOLOGICAL CLEARANCE

- A. Prior to placing the potable water systems in service, it shall be disinfected in accordance with AWWA Standard C651 and any additional requirements prescribed by the public health authorities having jurisdiction.
- B. The Contractor must set up the Temporary Pipe Tie-in utilizing the 2" tapping saddles and corporation stops, backflow preventer, etc. as noted on the detail for the testing.
- C. The form of chlorine for disinfection and the method of chlorine application shall be proposed by the Contractor and approved by the Owner before the disinfection process is started.
- D. The disinfection procedure shall be repeated until satisfactory bacteriological sampling has been achieved.

- E. Contractor may utilize an approved State Department of Health (DOH) certified laboratory or the Town of Jupiter Utilities laboratory which is also DOH certified.
- F. There will be no charge to the Contractor for using the Town of Jupiter Utilities laboratory. However, indication to do so must be provided in the bid documents. Sampling must be scheduled with the Town to occur during business hours Monday-Friday, 9am-2pm. Failure to do so will result in the contractor being responsible to pay for Town personnel overtime.
- G. If a Contractor is to utilize an independent laboratory, only the following parties shall be included in the chain of custody for each sample: Jupiter Utilities, or independent lab personnel.
- H. Following two consecutive samples that have failed to clear bacteriological quality requirements, an approved rechlorination technique and flushing shall be performed prior to resampling.
- I. Coordination of sampling with the Jupiter Utilities is required prior to initiating bacteriological clearance procedures.

- END OF SECTION -



Jack Long, Director
Southeast District Office

Florida Department of Environmental Protection

Southeast District Office
400 N. Congress Avenue, Suite 200
West Palm Beach, FL 33401
(561) 681-6600

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

CONSOLIDATED ENVIRONMENTAL RESOURCE PERMIT AND INTENT TO GRANT SOVEREIGNTY SUBMERGED LANDS AUTHORIZATION

PERMITTEE/AUTHORIZED ENTITY:

Town of Jupiter
c/o David Brown-Utilities Director
210 Military Trail
Jupiter, FL 33458

Permit/Authorization No.: 50-0163498-001

Date of Issue: **MAY 18 2010**

Expiration Date of

Construction Phase: **MAY 17 2015**

County: Palm Beach

Project: Town of Jupiter Utilities-Water Main
Crossing

This project requires an Environmental Resource Permit. Under the operating agreements between the Department and the water management districts, the Department has the authority to issue this permit. References: Part IV of Chapter 373, Florida Statutes; Title 62, Florida Administrative Code; Operating Agreements with the water management districts in Chapter 62-113, Florida Administrative Code.

ACTIVITY DESCRIPTION:

The purpose of the project is to conduct two 18-inch diameter bores that shall contain a singular 12-inch diameter water main, by means of horizontal directional drill (HDD) beneath surface waters of Lake Worth Creek. The first crossing shall occur along the west side of the U.S. Highway 1 Bridge under the South Channel of the Jupiter River. The entire length of the drill (uplands and water crossings) under the South Channel shall be approximately 830-linear feet, 184-linear feet under the Jupiter River. The second crossing shall occur along the east side of the U.S. Highway 1 Bridge under the North Channel of the Jupiter River. The entire length of the drill (uplands and water crossings) under the North Channel shall be approximately 536-linear feet, 232-linear feet under the Jupiter River. Each section of 12-inch diameter water main shall be installed a minimum of 20 feet below the sediment grade. The staging area and temporary workspaces shall be located entirely on the uplands, and access and egress will occur from U.S. Highway 1. Approximately 30 cubic yards of material will be severed from the Jupiter River during the drilling activities. All excess spoil material and drilling mud shall be transported to an approved upland landfill.

Red and white mangroves (*Rhizophora mangle* and *Languncularia racemosa*) occur along the banks of the waterbody and submerged bottom at the project site consists of *Halodule wrightii*, and *Halophila johnsonii*. The proposed activities shall be located a minimum of 20 feet beneath the waterbody and mangrove wetlands; therefore this permit does not authorize impacts to mangroves, seagrasses, or other wetland vegetation.

The standard manatee conditions will be adhered to during all in water work. All waterbodies and wetlands outside the specific limits of construction, authorized by this permit shall be protected from erosion, siltation, sedimentation, and/or scouring. Entry pits, exit pits, access, and egress shall be located on uplands. Sedimentation barriers and siltation screens shall be used around the entry and exit pits to protect water quality, control erosion, and prevent sediment runoff. Should the release of drilling materials occur, the appropriate actions shall take place in strict accordance with the attached "Proposed Methods for Protection of Water Quality for Directional Bored Water (BMPs and Frac-out Plan)".

ACTIVITY LOCATION:

The project is located in Lake Worth Creek, in the Loxahatchee River-Lake Worth Creek Aquatic Preserve, Class III Waters, Outstanding Florida Waters, adjacent to the U.S. Highway 1 Bridge, across the South and North

Channels of the Jupiter River, Jupiter (Sections 6 and 31, Townships 40 and 41 South, Range 43 East), in Palm Beach County (South Channel: Latitude N 26° 56' 9.55", Longitude W 80° 4' 55.89" to Latitude N 26° 56' 17.63", Longitude W 80° 5' 0.43", North Channel: Latitude N 26° 56' 29.13", Longitude W 80° 5' 2.55" to Latitude N 26° 56' 34.13", Longitude W 80° 5' 3.25").

This permit also constitutes a finding of consistency with Florida's Coastal Management Program, as required by Section 307 of the Coastal Zone Management Act.

This permit also constitutes certification of compliance with water quality standards under Section 401 of the Clean Water Act, 33 U.S.C. 1341.

This activity also requires a proprietary authorization, as the activity is located on sovereignty submerged lands owned by the Board of Trustees of the Internal Improvement Trust Fund, pursuant to Article X, Section 11 of the Florida Constitution, and Sections 253.002 and 253.77, F.S. The activity is not exempt from the need to obtain a proprietary authorization. The Department has the responsibility to review and take final action on this request for proprietary authorization in accordance with Section 18-21.0051, and the Operating Agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C. In addition to the above, this proprietary authorization has been reviewed in accordance with Chapter 253 and Chapter 258, F.S., Chapter 18-21, and Section 62-343.075, F.A.C.

As staff to the Board of Trustees, the Department has reviewed the activity described above, and has determined that the activity requires a Public Easement for the use of those lands, pursuant to Chapter 253.77, F.S. The Department intends to issue the Public Easement subject to the recommended fees and conditions.

The final documents required to execute the Public Easement have been sent to the Division of State Lands. The Department intends to issue the Public Easement upon satisfactory execution of those documents. **You may not begin construction of this activity on state-owned, sovereignty submerged lands until the Public Easement has been executed to the satisfaction of the Department.**

Federal authorization for the proposed project is reviewed by DEP pursuant to an agreement between the Department and the U.S. Army Corps of Engineers (Corps). The agreement is outlined in a document titled *Coordination Agreement Between the U.S. Army Corps of Engineers and the Florida Department of Environmental Protection State Programmatic General Permit, Section 10 of the Rivers and Harbor Act of 1899 and Section 404 of the Clean Water Act.*

Your project has been reviewed for compliance with a State Programmatic General Permit (SPGP). As shown on the attached drawings, the proposed project is **not** consistent with the SPGP program. A copy of your application has been sent to the Corps who may require a separate permit. Failure to obtain their authorization prior to construction could subject you to enforcement action. For further information, contact the Corps directly.

You are hereby advised that authorizations also may be required by other federal, state, and local entities. This authorization does not relieve you from the requirements to obtain all other required permits and authorizations.

The above named permittee is hereby authorized to construct the work shown on the application and attached drawing(s), plans, and other documents attached hereto and made a part hereof. **This permit and intent to grant authorization to use sovereignty submerged lands are subject to the limits, conditions, and locations of work shown in the attached drawings, and are also subject to the attached 19 General Conditions, 9 General Consent Conditions, and 19 Specific Conditions, which are a binding part of this permit and authorization.** You are advised to read and understand these drawings and conditions prior to commencing the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings. If you are utilizing a contractor, the contractor also should read and understand these drawings and conditions prior to

commencing the authorized activities. Failure to comply with all drawings and conditions shall constitute grounds for revocation of the permit and appropriate enforcement action.

Operation of the facility is not authorized except when determined to be in conformance with all applicable rules and with the general and specific conditions of this permit/certification/authorization, as specifically described below.

GENERAL CONDITIONS:

(1) All activities authorized by this permit shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity shall constitute a violation of this permit and Part IV, Chapter 373, F.S.

(2) This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by the Department staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.

(3) Activities approved by this permit shall be conducted in a manner which does not cause violations of state water quality standards. The permittee shall implement best management practices for erosion and pollution control to prevent violation of state water quality standards. Temporary erosion control shall be implemented prior to and during construction, and permanent control measures shall be completed within 7 days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the permitted work. Turbidity barriers shall remain in place at all locations until construction is completed and soils are stabilized and vegetation has been established. All practices shall be in accordance with the guidelines and specifications described in Chapter 6 of the Florida Land Development Manual; A Guide to Sound Land and Water Management (Department of Environmental Regulation, 1988), unless a project-specific erosion and sediment control plan is approved as part of the permit. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.

(4) The permittee shall notify the Department of the anticipated construction start date within 30 days of the date that this permit is issued. **At least 48 hours prior to commencement** of activity authorized by this permit, the permittee shall submit to the Department an "Environmental Resource Permit Construction Commencement" notice (Form No. 62-343.900(3), F.A.C.) indicating the actual start date and the expected completion date.

(5) When the duration of construction will exceed one year, the permittee shall submit construction status reports to the Department on an annual basis utilizing an "Annual Status Report Form" (Form No. 62-343.900(4), F.A.C.). Status Report Forms shall be submitted the following June of each year.

(6) **Within 30 days after completion of construction** of the permitted activity, the permittee shall submit a written statement of completion and certification by a registered professional engineer or other appropriate individual as authorized by law, utilizing the supplied "Environmental Resource Permit As-Built Certification by a Registered Professional" (Form No. 62-343.900(5), F.A.C.). The statement of completion and certification shall be based on on-site observation of construction or review of as-built drawings for the purpose of determining if the work was completed in compliance with permitted plans and specifications. This submittal shall serve to notify the Department that the system is ready for inspection. Additionally, if deviation from the attached drawings are discovered during the certification process, the certification must be accompanied by a copy of the attached permit drawings with deviations noted. Both the original and revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawing. All surveyed dimensions and elevations shall be certified by a registered surveyor.

(7) The operation phase of this permit shall not become effective: until the permittee has complied with the requirements of condition (6) above, has **submitted a "Request for Transfer of Environmental Resource Permit Construction Phase to Operation Phase"** (Form No. 62-343.900(7), F.A.C.); the Department determines the system to be in compliance with the permitted plans and specifications; and the entity approved by the Department in accordance with Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit Applications Within the South Florida Water Management District - August 1995, accepts responsibility for

operation and maintenance of the system. The permit shall not be transferred to such approved operation and maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the Department, the permittee shall initiate transfer of the permit to the approved responsible operating entity if different from the permittee. Until the permit is transferred pursuant to Section 62-343.110(1)(d), F.A.C., the permittee shall be liable for compliance with the terms of the permit.

(8) Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of the phase or portion of the system to a local government or other responsible entity.

(9) For those systems that will be operated or maintained by an entity that will require an easement or deed restriction in order to enable that entity to operate or maintain the system in conformance with this permit, such easement or deed restriction must be recorded in the public records and submitted to the Department along with any other final operation and maintenance documents required by sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit Applications Within the South Florida Water Management District - August 1995, prior to lot or unit sales or prior to the completion of the system, whichever occurs first. Other documents concerning the establishment and authority of the operating entity must be filed with the Secretary of State where appropriate. For those systems which are proposed to be maintained by the county or municipal entities, final operation and maintenance documents must be received by the Department when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final documents will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system and any other permit conditions.

(10) Should any other regulatory agency require changes to the permitted system, the permittee shall notify the Department in writing of the changes prior to implementation so that a determination can be made whether a permit modification is required.

(11) This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and Chapter 40E-4 or Chapter 40E-40, F.A.C.

(12) The permittee is hereby advised that Section 253.77, F.S. states that a person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the state, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required lease, license, easement, or other form of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on sovereignty lands or other state-owned lands.

(13) The permittee is advised that the rules of the South Florida Water Management District require the permittee to obtain a water use permit from the South Florida Water Management District prior to construction dewatering, unless the work qualifies for a general permit pursuant to subsection 40E-20.302(3), F.A.C., also known as the "No Notice" rule.

(14) The permittee shall hold and save the Department harmless from any and all damages, claims, or liabilities which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any system authorized by the permit.

(15) Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under section 373.421(2), F.S., provides otherwise.

(16) The permittee shall notify the Department in writing within 30 days of any sale, conveyance, or other transfer of ownership or control of a permitted system or the real property on which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of section 62-343.130, F.A.C. The permittee transferring the permit shall remain liable for corrective actions that may be required as a result of any violations prior to the sale, conveyance or other transfer of the system.

(17) Upon reasonable notice to the permittee, Department authorized staff with proper identification shall have permission to enter, inspect, sample and test the system to insure conformity with the plans and specifications approved by the permit.

(18) If historical or archaeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the appropriate Department office.

(19) The permittee shall immediately notify the Department in writing of any previously submitted information that is later discovered to be inaccurate.

GENERAL CONSENT CONDITIONS:

(1) Authorizations are valid only for the specified activity or use. Any unauthorized deviation from the specified activity or use and the conditions for undertaking that activity or use shall constitute a violation. Violation of the authorization shall result in suspension or revocation of the grantee's use of the sovereignty submerged land unless cured to the satisfaction of the Board.

(2) Authorizations convey no title to sovereignty submerged land or water column, nor do they constitute recognition or acknowledgment of any other person's title to such land or water.

(3) Authorizations may be modified, suspended or revoked in accordance with their terms or the remedies provided in Sections 253.04 and 258.46, F.S., or Chapter 18-14, F.A.C.

(4) Structures or activities shall be constructed and used to avoid or minimize adverse impacts to sovereignty submerged lands and resources.

(5) Construction, use, or operation of the structure or activity shall not adversely affect any species which is endangered, threatened or of special concern, as listed in Rules 68A-27.003, 68A-27.004, and 68A-27.005, F.A.C.

(6) Structures or activities shall not unreasonably interfere with riparian rights. When a court of competent jurisdiction determines that riparian rights have been unlawfully affected, the structure or activity shall be modified in accordance with the court's decision.

(7) Structures or activities shall not create a navigational hazard.

(8) Structures shall be maintained in a functional condition and shall be repaired or removed if they become dilapidated to such an extent that they are no longer functional. This shall not be construed to prohibit the repair or replacement subject to the provisions of Rule 18-21.005, F.A.C., within one year, of a structure damaged in a discrete event such as a storm, flood, accident, or fire.

(9) Structures or activities shall be constructed, operated, and maintained solely for water dependent purposes, or for non-water dependent activities authorized under paragraph 18-21.004(1)(f), F.A.C., or any other applicable law.

SPECIFIC CONDITIONS:

(1) **The terms, conditions, and provisions of the required public easements shall be met. Construction of this activity shall not commence on sovereign submerged lands, title to which is held by the Board of Trustees of the Internal Improvement Trust Fund, until all required easement documents have been executed to the satisfaction of the Department.**

(2) The project drawings, sheets 1 through 16; the permit checklist; the 3-page Standard Manatee Conditions for In-Water Work, 2009; the 3-page "Proposed Methods for Protection of Water Quality for Directional Bored Water (BMPs and Frac-out Plan)"; the Estimated Volume of Material to be Excavated From Submerged Lands; and DEP forms: 62-343.900 (3), (4), (5), and (7) F.A.C., which may be downloaded at

<http://www.dep.state.fl.us/water/wetlands/erp/forms.htm>. If the applicant does not have access to the Internet, the applicant shall contact the Department at (561) 681-6646 to request the aforementioned forms and/or documents.

(3) If the attached permit drawings conflict with the specific conditions, then the specific conditions shall prevail.

(4) After selection of the contractor to perform the authorized activities and prior to the initiation of any work authorized by this permit, the permittee (or authorized agent) and the contractor shall attend a pre-construction conference with a representative of the Department. The permittee shall contact the Department in writing to schedule the conference. Department of Environmental Protection, Southeast District, Submerged Lands & Environmental Resources Program, Compliance/Enforcement Section, Attention: Katy Collins, 400 N. Congress Ave., Suite 200, West Palm Beach, Florida 33401 (phone: 561/681-6645).

(5) The permittee shall be responsible for ensuring that the permit conditions are explained to all construction personnel working on the project, and for providing each contractor and subcontractor with a copy of this permit before construction begins.

(6) The work authorized by this permit shall not be conducted on any property, other than that owned by the permittee, without prior written approval of that property owner.

(7) All storage or stockpiling of tools or materials (i.e. lumber, pilings, pipes, casings, etc.) shall be limited to adjacent uplands and the temporary workspace depicted on the attached drawings.

(8) The entry and exit points of the directional drill shall be located on uplands and contained with berms/staked hay bales to contain any material from traveling into surrounding areas.

(9) No impacts to mangroves, seagrasses, or other wetland/submerged vegetation are authorized by this permit.

(10) This permit authorizes the installation of two 12-inch diameter water mains (18" diameter bore) and shall be accomplished by horizontal directional drilling. No return water shall be discharged into adjacent surface waters and wetlands and all severed materials shall be temporarily placed in one of the upland drilling and drilling mud containment pits. The each drilling pit shall be surrounded by a 4' x 8' x 2' earthen berm during the installation of the watermain, as shown on the attached drawings. The spoil containment pits and berms shall be constructed to contain all severed materials and prevent the escape of severed materials and associated effluent into adjacent surface waters and wetlands.

(11) All HDD activities shall take place during daylight hours only.

(12) Prior to construction, the permittee shall select a professional biologist that is experienced in the biological sciences that will be available in the event of a frac-out throughout the installation and construction phase of the drill.

(13) The permittee shall implement the following Best Management Practices (BMPs) to minimize the potential for adverse environmental impacts during *HDD activities*:

- A. Best management practices for erosion control within the staging area shall be implemented and maintained at all times during construction of the upland entry pit and drilling operations to prevent siltation and turbid discharges in excess of State water quality standards pursuant to Rule 62-302, F.A.C. Methods shall include, but are not limited to, the use of staked hay bales, staked filter cloth, sodding, seeding, and mulching; staged construction; and the

installation of turbidity screens around the immediate project site. Dewatering will require a permit from the South Florida Water Management District.

- B. To provide an additional level of resource protection, the volume of bentonite in the drill string shall be monitored at all times during directional drilling operation. Should a drop in volume of bentonite occur, the following measures will be taken:
 - 1. Immediately conduct a visual inspection of both terrestrial and subaqueous portions of the HDD corridor. Notify the DEP-Southeast District Office ERP Compliance/Enforcement Section within 2 hours of detection at 561/681-6645 if a frac-out is detected.
 - 2. Should the release of drilling materials occur on land, a sediment fence shall be constructed around the site and the material shall be removed by vacuum truck.
 - 3. Should the release of drilling materials occur, the appropriate actions shall take place in strict accordance with the attached "Proposed Methods for Protection of Water Quality for Directional Bored Water (BMPs and Frac-out Plan)".
- C. In order to minimize the possibility of a bentonite release during punch out, the site project manager shall consider the use of water in place of bentonite during the last 30 to 50 feet of the directional bore. The HDD operator shall stop the flow of recirculated bentonite and the borehole shall be flushed with water to remove the bentonite. Once the drill string is clear of bentonite, drilling will continue using only water as the boring medium. The first monitoring report submitted to the Department will discuss if water was used during the final stages of drilling and if not, the reasons why it wasn't feasible.

(14) Max Gel, and Max Gel combined with Drillplex, may be added to the bentonite drilling muds to reduce the risk of inadvertent returns. The minimum quantity of (individual) additive necessary for the filling shall be used and the maximum quantity of (individual) additive shall not exceed one-third the (individual) additive EC50 or LC50 data in accordance with Section 62-302.200, F.A.C. The concentrations shall not exceed the cumulative EC50 if multiple products are utilized. Additional additives to the bentonite drilling muds other than those specifically listed above, shall not be used without the Department's prior approval. If additional additives are needed, a permit modification will be required. Toxicity evaluations using marine organisms with concentrations of additives representative of those proposed for HDD boring will be required to evaluate the permit modification request.

(15) A fully enclosed vacuum truck shall remove the excavated materials from the containment pits and transport the excavated materials to a landfill. Within 30 days, receipts shall be submitted to the Department at the address listed in Specific Condition No. 4.

(16) Within 60 days after completion of construction, the permittee shall submit record drawings (as-builts) to the office listed in Specific Condition No. 4. The drawings shall be in a format that will facilitate a direct comparison of the permitted activities and the work actually constructed.

(17) The permittee shall comply with the standard manatee protection construction conditions listed in the attachment, "Standard Manatee Conditions for In-water Work, 2009."

(18) Within 14 days of the pipe installation, the permittee shall fully restore the staging area to their original condition. Paved surfaces shall be repaired and unpaved surface areas shall be replanted with native vegetation.

(19) If prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, the permitted project should cease all activities involving subsurface disturbance in the immediate vicinity of such discoveries. The permittee, or other designee, should contact the Florida Department of State, Division of Historical Resources, Review and Compliance Section at 850/245-6333 or 800/847-7278, as well as the appropriate permitting agency office. Project activities should not resume without verbal and/or written authorization from the Division of Historical Resources. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, Florida Statutes.

RIGHTS OF AFFECTED PARTIES

This permit and intent to grant a public easement on sovereignty submerged lands are hereby granted. This action is final and effective on the date filed with the Clerk of the Department unless a sufficient petition for an administrative hearing is timely filed under sections 120.569 and 120.57 of the Florida Statutes as provided below. If a sufficient petition for an administrative hearing is timely filed, this action automatically becomes only proposed agency action on the application, subject to the result of the administrative review process. Therefore, on the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. The actual terms of the public easement, will be formally executed at a later date and shall include provisions for rents and such other provisions as normally are included in such public easement, use agreement, management agreement, treasure salvage use agreement. Because an administrative hearing may result in the reversal or substantial modification of this action, the applicant is advised not to commence construction or other activities until the deadlines noted below for filing a petition for an administrative hearing or request for an extension of time have expired and until the public easement has been executed and delivered.

Mediation is not available.

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 Florida Statutes. 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.

Under rule 62-110.106(4) of the 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. 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. If a request is filed late, the Department may still grant it upon a 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.

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 by the applicant must be filed within 14 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) of the Florida Statutes must be filed within 14 days of publication of the notice or within 14 days of receipt of the written notice, whichever occurs first. Under section 120.60(3) of the Florida Statutes, however, any person who has asked the Department for notice of agency action may file a petition within 14 days of receipt of such notice, regardless of the date of publication.

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 person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 of the Florida Statutes.

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 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; 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.

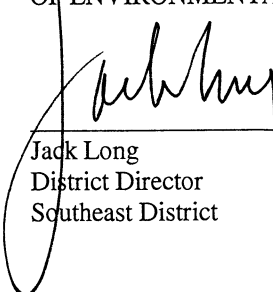
A petition that does not dispute the material facts on which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by rule 28-106.301.

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

This permit constitutes an order of the Department. Subject to the provisions of paragraph 120.68(7)(a) of the Florida Statutes, which may require a remand for an administrative hearing, the applicant has the right to seek judicial review of the order under section 120.68 of the Florida Statutes, by the filing of a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 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 when the order is filed with the Clerk of the Department.

Executed in West Palm Beach, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



Jack Long
District Director
Southeast District

5-18-2010

Date


JL/JS/jk/dm

Permittee: Town of Jupiter Utilities-Watermain Crossing
File No.: 50-0163498-001
Page 10

Copies furnished to:

FDEP Compliance & Enforcement – Katy Collins
FDEP Coastal and Aquatic Managed Areas, Laura Herren
USACOE – Palm Beach Gardens, Samantha Rice, Samantha.L.Rice@usace.army.mil
FFWCC Bureau of Imperiled Species Management, fcmpmail@myfwc.com
Town of Jupiter, Steven Montemayor, stevenm@jupiter.fl.us
Jupiter Inlet District, Mike Grella, MGrella@jupiterinletdistrict.org

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this permit and authorization to use sovereignty submerged lands, including all copies, were mailed before the close of business on MAY 18 2010, to the above listed persons.

FILING AND ACKNOWLEDGMENT

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

Rachel Osborne 5/18/10
Clerk Date

Prepared by: Daniel Moretz.

23 pages attached.



Charlie Crist
Governor

Angela/Steven M (file 09-20 permit)
Ana M. Viamonte Ros, M.D., M.P.H.
State Surgeon General

**David Brown, P.E.
Director of Utilities
210 Military Trail
Jupiter, FL 33458 4**

PERMIT NO.: 138279-274-DSGP

EXPIRATION DATE: 12/13/2014

UTILITY: Jupiter

PROJECT: US 1 Bridge Water Main Relocations

This permit is issued under the provisions of Palm Beach County Ordinance No. 97-58 and Palm Beach County ECR-II. The above named applicant is hereby authorized to perform the work shown on the approved plan(s) attached hereto and made a part hereof and specifically described as follows:

Construct water main replacements crossing the north and south channels of the Jupiter River along U. S. Highway 1 in the Town of Jupiter, Florida.

This permit is subject to the following conditions:

1. It shall be the responsibility of the permittee to retain a professional engineer, registered in Florida, to observe that the construction is in accordance with the submitted plans.
2. This permit does not include construction of any conflict manholes. The construction shall be strictly in accordance with the "Standard Water and Sewer Separation Statement" and other design specifications noted on the engineering plans. If field conditions require deviations from the proposed design, the project engineer shall consult with this agency prior to construction.
3. An approval must be obtained from this agency prior to placing the water system into operation; approval can be requested by submitting a completed DEP Form # 62-555.900(9) for "Certification of Construction Completion and Request For Clearance to Place Permitted PWS Components into Operation" together with a set of record drawings. All crossings between water lines and sanitary or storm sewers and force mains must be clearly identified with elevation on all record drawings.
4. Prior to construction, all required permits or approvals must be obtained for all aspects of the project from the appropriate agencies. This permit does not include construction of any reclaim water facilities. Such permits must be obtained separately from the appropriate agency.

Darrel J. Graziani, P.E., P.S.
Environmental Administrator - Water Programs
Division of Environmental Public Health

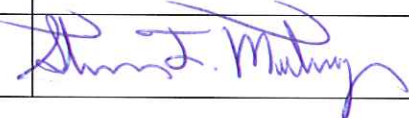
c: Project Engineer: Steven F. Montemayor, P.E.
Utility: same



PALM BEACH COUNTY HEALTH DEPARTMENT
Post Office Box 29 / 800 Clematis Street, West Palm Beach, FL 33402
Alina M. Alonso, M.D., Director
www.pbchd.com

UTILITY PERMIT

2010-H-496-0009-93040

PERMIT NO.:		SECTION NO.: 93040		STATE ROAD S.R. 5		COUNTY Palm Beach	
FDOT construction is proposed or underway.				☒ Yes		☐ No	
Is this work related to an approved Utility Work Schedule?				☐ Yes		☒ No	
PERMITTEE:		Septa, Town of Jupiter					
ADDRESS:		210 Military Trail				TELEPHONE NUMBER: (561) 741 - 2710	
CITY/STATE/ZIP:		Jupiter, Florida 33458					
The above PERMITTEE requests permission from the State of Florida Department of Transportation, hereinafter called the FDOT, to construct, operate and maintain the following: watermain that are to be relocated off of bridges along U.S. Hwy 1 / S. R. 5 and horizontal directional drilled under both the north and south channels of the Jupiter River within the Town of Jupiter due to proposed FDOT Low Level Bridges Replacement project.							
FROM: from North of SR 706 at Coastal Way 9.953				TO: South of CR A1A (Ocean Blvd) 10.570			
Submitted for the PERMITTEE by: Name and Company (Typed or Printed Legibly)		Contact Information Address/Telephone/E-Mail (if applicable)		Signature		Date	
Steven F. Montemayor, P.E. Town of Jupiter		210 MILITARY TR; JUPITER, FL 561-741-2710 stevenm@jupiter.fl.us				1/8/10	

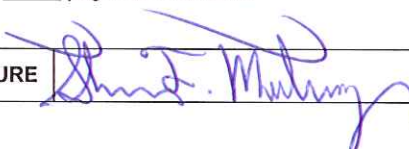
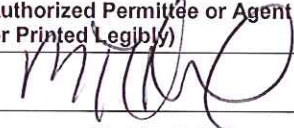
- The Permittee declares that prior to filing this application, the location of all existing utilities that it owns or has an interest in, both aerial and underground, are accurately shown on the plans and a letter of notification was mailed on list attached to the following utilities known to be involved or potentially impacted in the area of the proposed installation: list attached
- 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 Brett Drouin, located at West Palm Beach Operations, Telephone Number 561-432-4966. The Permittee's employee responsible for MOT is Steven F. Montemayor, Telephone Number 561-741-2710. (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 60 days after issuance of permit, and shall be completed within 180 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(1), 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 paragraphs (a) and (b), 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 for highways, the requirements of the Standard Application Package for railways, including flagging services and Railroad Protective Insurance or acceptable alternative, when applicable, and the FDOT's Design Standards, Indexes 600-670, and Standard Specifications for Road and Bridge Construction, Section 102, as amended by the UAM. When a Utility deems it necessary to conduct Traffic Control activities and methods significantly different from those addressed in the above references, the Utility must submit an alternative plan signed and sealed by a licensed Florida professional engineer qualified to develop TCP in accordance with the provisions of Chapter 8 of 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 just north of S.R. 706 at Coastal Way and south of C.R. A1A 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 Utility or anyone within the permitted construction limits, the Utility shall immediately cease work and notify the FDOT. The FDOT shall coordinate with the appropriate agencies and notify the Permittee of any suspension or revocation of the permit until contamination assessment and remediation, as appropriate under Rule Chapters 62-770 and 62-730 Florida Administrative Code, has progressed to a state that all environmental regulatory agencies having jurisdiction have approved the site of the contamination for resumption of work.

UTILITY PERMIT

15. 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 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: _____
- _____
- _____
- _____
- _____

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. Receipt of this permit acknowledges responsibility to comply with Section 119.07(3), Florida Statutes, and UAM Chapter 4.5.2, regarding Exempt Documents and Security System Plans Requests.
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	Steven F. Montemayor, P.E., Utilities Engineer	SIGNATURE		DATE:	1/8/10
	Name & Title of Authorized Permittee or Agent (Typed or Printed Legibly)				
APPROVED BY:				ISSUE DATE:	6/29/10
	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

SEE ATTACHMENT "A"

TOWN OF JUPITER PROJECT JW 09-20

U.S. 1 / S.R. 5 BRIDGES

WATERMAIN RELOCATION

UTILITY CONFLICT REQUESTS

Utility Contact	Conflict Request	Utility Response
Paul Brienza, P.E. Loxahatchee River District 2500 Jupiter Park Drive Jupiter, Florida 33458 561-747-5700 paul@loxahatcheeriver.org	drawings were submitted via hand delivery on 10/14/09 for sanitary sewer conflicts	received e-mail on 1/7/10 indicating force main conflict with proposed potable water main and providing a depth to top of existing force main pipe at conflict
Leonard T. Chiocca Florida Power & Light Distribution Operations 100 South Delaware Boulevard Jupiter, Florida 33458 leonard_t_chiocca@fpl.com	drawings were submitted via hand delivery on 10/14/09 for electric utility conflicts	received hand marked up drawings on 10/23/09 showing underground and overhead electric utility lines in the area
Jorge Bouza Teco Peoples Gas 5101 Northwest 21st Avenue, Suite 460 Fort Lauderdale, Florida 33309 954-453-0814 jbouza@tecoenergy.com	drawings were submitted via e-mailed on 10/14/09 for natural gas pipe utility conflicts	received as-built drawings via hand delivery on 10/27/09 for Teco Peoples Gas facilities at Coastal Way and A1A intersections along U.S. Hwy 1
Henry Patino Comcast Cable 7201 North Federal Highway Boca Raton, Florida 33487 561-454-5807 henry_patino@cable.comcast.com	drawings were submitted via e-mailed on 10/26/09 for Comcast utility conflicts	received an e-mail on 10/27/09 that Comcast has no facilities within the project area
Robert C. Lowen AT&T Florida 2021 South Military Trail West Palm Beach, Florida 33415 561-357-6615 Robert.lowen@att.com	drawings were submitted via e-mailed on 10/26/09 for AT&T Florida communication utility conflicts	received an e-mail on 10/26/09 that AT&T Florida provided their buried facilities markups to our Surveyor David C. Lidberg.
Rodney Friedel Palm Beach County – Traffic Division 2300 North Jog Road West Palm Beach, Florida 33411 561-681-4371 rfriedel@pbcgov.org	drawings were submitted via e-mailed on 10/14/09 for Traffic ITS communication conflicts	received an e-mail on 10/15/09 that PBC Traffic ITS Communications has no facilities within the project area
Diana Rivas Palm Beach County – Traffic Division 2300 North Jog Road West Palm Beach, Florida 33411 561-681-4371 dyrivas@pbcgov.org	drawings were submitted via e-mailed on 10/15/09 for traffic signal utility conflicts	received an e-mail on 10/15/09 that PBC Traffic does not anticipate any conflicts with their signals

SPECIAL PROVISIONS/CONDITIONS
UTILITY PERMITS
DIRECTIONAL & JACK & BORES
ATTACHMENT "A"

All new or replaced underground facilities within the Right of Way shall be made electronically detectable using techniques available in the industry.

It is the Permittee's responsibility to obtain final acceptance of permitted work (completed) and the restoration of the Right of Way from the Department prior to usage.

Permittee will restore the Right of Way as a minimum, to its original condition or better in accordance w/FDOT's Standard Specifications for Road & Bridge Construction or as directed by the Resident Operations Engineer.

Permittee will ensure that all locates have been performed prior to scheduling of any boring activities. This shall include soft digs to verify vertical & horizontal alignment.

Permittee's representative & an FDOT Inspector must be on site during all boring activities. Upon completion of the boring activities, Permittee shall provide all documentation to be in accordance with FDOT Standard Specifications, Section 555 or 556, whichever is applicable.

All maintenance of traffic (MOT) will be in accordance with the Department's current edition of the Design Standards, (600 series). The Operations Engineer or his designee reserves the right to direct the removal/relocation/modification of any traffic device(s) at the Permittee's sole expense.

Restricted hours of operation will be from 9:00 am to 3:30 pm, (Monday thru Friday), unless otherwise approved by the Operations Engineer, or designee.

Permit is valid for six (6) months from the date of issue.

PERMITTEE: PLEASE NOTE:

Permittee's contractors that are performing directional drilling and/or jack and bore activities shall provide the Department (Permits Office) proof of a proper state contractor's license and certificate of liability insurance prior to any commencement of permitted work.

Permittee shall use the current editions of the Department's Design Standards, Standard Specifications for Road and Bridge Construction and applicable manuals, policies and procedures.

Permittee will coordinate (i.e. Pre-construction meetings, inspections, final acceptance of work, etc) all permitted work with Transfield Services, Attn: Larry Deckert @ Mobile 954-317-8044, Fax 954-978-9840 and/or email @ DeckertL@transfieldservices.com.

SEE ATTACHMENT "B"

In addition to other conditions, Permittee will coordinate all permitted work with Mr. Johnny Blakeney, Utility Coordinator, Palm Beach Operations @ 561-261-0735.

Permittee will provide the Department with certified "As-Built" plans prior to final acceptance of the permitted work.

SECTION 555

DIRECTIONAL BORE

555-1 Description.

555-1.1 Scope of Work: The work specified in this Section documents the approved construction methods, procedures and materials for Directional Boring, also commonly called Horizontal Directional Drilling (HDD).

555-1.2 General: HDD is a trenchless method for installing a product that serves as a conduit for liquids, gasses, or as a duct for pipe, cable, or wire line products. It is a multi-stage process consisting of site preparation and restoration, equipment setup, and drilling a pilot bore along a predetermined path and then pulling the product back through the drilled space. When necessary, enlargement of the pilot bore hole may be necessary to accommodate a product larger than the pilot bore hole size. This process is referred to as back reaming and is done at the same time the product is being pulled back through the pilot bore hole.

Accomplish alignment of the bore by proper orientation of the drill bit head as it is being pushed into the ground by a hydraulic jack. Determine orientation and tracking of the drill bit by an above ground radio detection device which picks up a radio signal generated from a transmitter located within the drill bit head. Then electronically translate the radio signal into depth and alignment. In order to minimize friction and prevent collapse of the bore hole, introduce a soil stabilizing agent (drilling fluid) into the annular bore space from the trailing end of the drill bit. The rotation of the bit in the soil wetted by the drilling fluid creates a slurry. The slurry acts to stabilize the surrounding soil and prevent collapse of the bore hole as well as provides lubrication.

Select or design drilling fluids for the site specific soil and ground water conditions. Confine free flowing (escaping) slurry or drilling fluids at the ground surface during pull back or drilling. Accomplish this by creating sump areas or vacuum operations to prevent damage or hazardous conditions in surrounding areas. Remove all residual slurry from the surface and restore the site to preconstruction conditions.....

555-6 Documentation Requirements.

555-6.1 Boring Path Report: Furnish a Bore Path Report to the Engineer within seven days of the completion of each bore path. Include the following in the report:

- (a) Location of project and financial project number including the Permit Number when assigned
- (b) Name of person collecting data, including title, position and company name
- (c) Investigation site location (Contract plans station number or reference to a permanent structure within the project right-of-way)
- (d) Identification of the detection method used
- (e) Elevations and offset dimensions as required in 555-4.2

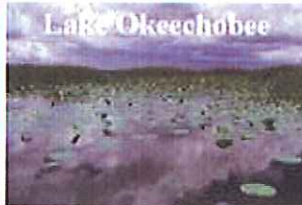
555-6.2 As-Built Plans: Provide the Engineer a complete set of As-Built Plans showing all bores (successful and failed) within 30 calendar days of completing the work. Ensure that the plans are dimensionally correct copies of the Contract plans and include roadway plan and profile, cross-section, boring location and subsurface conditions as

directed by the Engineer. The plans must show appropriate elevations and be referenced to a Department Bench Mark when associated with a Department project, otherwise to a USGS grid system and datum, or a specific location on top of an existing Department head wall. Plans must be same scale in black ink on white paper, of the same size and weight as the Contract plans. Submittal of electronic plans data in lieu of hard copy plans is preferred and may be approved by the Engineer if compatible with the Department software. Specific plans content requirements include but may not be limited to the following:

- (a) The Contract plan view shows the center line location of each facility installed, or installed and placed out of service, to an accuracy of 1 inch at the ends and other points physically observed in accordance with the bore path report.
- (b) As directed by the Engineer, provide either a profile plan for each bore path, or a cross-section of the roadway at a station specified by the Engineer, or a roadway centerline profile. Show the ground or pavement surface and crown elevation of each facility installed, or installed and placed out of service, to an accuracy within 1 inch at the ends and other exposed locations. On profile plans for bore paths crossing the roadway show stationing of the crossing on the Contract plans. On the profile plans for the bore paths paralleling the roadway, show the Contract plans stationing. If the profile plan for the bore path is not made on a copy of one of the Contract profile or crosssection sheets, use a 10 to 1 vertical exaggeration.
- (c) If, during boring, an obstruction is encountered which prevents completion of the installation in accordance with the design location and specification, and the product is left in place and taken out of service, show the failed bore path along with the final bore path on the plans. Note the failed bore path as "Failed Bore Path - Taken Out of Service". Also show the name of the Utility owner, location and length of the drill head and any drill stems not removed from the bore path.
- (d) Show the top elevation, diameter and material type of all utilities encountered and physically observed during the subsoil investigation. For all other obstructions encountered during a subsoil investigation or the installation, show the type of material, horizontal and vertical location, top and lowest elevation observed, and note if the obstruction continues below the lowest point observed.
- (e) Include bore notes on each plan stating the final bore path diameter, product diameter, drilling fluid composition, composition of any other materials used to fill the annular void between the bore path and the product, or facility placed out of service. Note if the product is a casing as well as the size and type of carrier pipe placed within the casing as part of the Contract work.

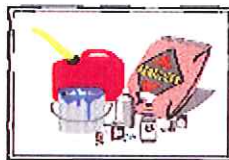
National Pollutant Discharge Elimination System

Palm Beach



BE A RESPONSIBLE NEW NEIGHBOR ON THE STATE'S HIGHWAY

- If you see a spill (oil or other hazardous materials) on the highway or any adjacent property, please call the
STATE WATCH OFFICE 1-800-320-0519 OR
- To report an illicit discharge or illegal dumping on the highway, please call
FDOT-(561) 432-4966
- If you have hazardous waste materials to dispose of, please call :
THE DEPARTMENT OF ENVIRONMENTAL PROTECTION (561) 681-6600



- Return used oil to your nearest service station or any auto supply store for recycling.
- To keep up to date on your stormwater responsibility please contact the:
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AT (850) 245-7522
or visit <http://www.dep.state.fl.us/water>
<http://stormwaterandme.org>

SWEEP AND REMOVE, Do not wash fertilizers, grass clippings, pesticides, soil, or sediment into the storm drains system.

DURING CONSTRUCTION, clean equipment tires before leaving your site and don't allow any erosion or sediment to enter the highway storm drain system. Control waste that may cause adverse impacts to water quality.

Remember, what goes into a storm drain ends up floating in our waterways or washing up on our beaches!!!

PLEASE DON'T POLLUTE OUR WATER IN SOUTH FLORIDA

