FLOOD MITIGATION DESIGN FOR SLEEPY LAGOON:
General Harris Street, Penfield Street, Marbury Lane

WA NO. 2025-02

TECHNICAL SPECIFICATIONS
90% SUBMITTAL

August 2026

INFRASTRUCTURE SOLUTION SERVICES

An HR Green Company

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SECTION 01 10 00 –GENERAL

PART 1 – GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. The work covered by these specifications includes the furnishing of all labor, equipment, materials and performing all operations in connection with the installation and/or modification of pavement, driveways, stormwater management systems, water and wastewater services, landscape restoration, utility coordination, and all appurtenant work, in compliance with the drawings, specifications and Contract Documents. The Contractor shall perform all operations and incidentals necessary to complete the work.

1.02 SUMMARY OF WORK

A. The Improvements under this Contract consist of proposed roadway improvements on General Harris Street, Penfield Street, Marbury Lane in the Sleepy Lagoon neighborhood. The proposed roadway improvements include road elevation / reconstruction; a new stormwater collection system; four (4) new outfalls with seawall penetrations; utility deflections, relocation and service line adjustments; landscape restoration; and driveway restoration. The awarded contractor shall provide all permits, labor, equipment, materials, supplies, transportation, and supervision necessary to construct the proposed roadway improvements. Work includes all testing required by the Town to place adjusted potable water main and residential utility service lines back in service. All disturbed work areas in public rights-of-way, utility easements and on private property shall be restored in kind to a like or better condition in accordance with the contract documents.

1.03 UTILITY

A. The Contractor shall provide temporary utility service during the construction of this project, as required.

1.04 SEQUENCE OF WORK

A. Refer to the Special Provisions section for the general guidelines for the Sequence of Construction for this project.

1.05 SALVAGED EQUIPMENT AND MATERIALS

A. Salvaged materials, equipment or supplies are the property of the Owner and shall be removed from the project site as soon as practical. Surplus excavated materials shall be disposed of in accordance with state and local laws by the Contractor in a legal manner at no additional cost to the Owner.

1.06 RECORD DATA

A. The Contractor shall maintain, during the progress of the project, accurate records of the location, length and elevations of all new and existing pipes and appurtenances. In addition, the record drawings shall reflect actual grades of the roadway improvements.

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A set of drawings will be provided for the Contractor to be kept at the job site for this purpose. Promptly after completion of any portion of the work provided, as paid for in this Contract, the Contractor shall deliver to the Engineer the drawings with accurate notations recorded thereon as necessary to check the drawings for record purposes. As-built data shall be submitted with each pay application, said pay application shall not be accepted until as-builts are noted up to date by the project manager. The Contractor shall also provide the as-built information on the electronic CADD files provided by the Engineer. The final record drawings shall be signed and sealed by a Professional Surveyor and Mapper and provided to the Engineer in the required format, for each applicable agency, for final certifications. Information to be shown for pavement grades, curb elevations, stormwater pipe, structures, end walls valves, modified utility mains shall include the location of all crosses, tees, wyes, bends, valves, curb stops, hydrants, stub-outs, blow-offs, air release valves, etc., by using a two (2) point swing measurement from permanent physical features that can readily be found on the drawing and in the field in a table format. The Contractor shall furnish "as-built" top of pipe elevations and finish grade for top of trench for all modified utility mains at maximum intervals of one hundred feet (100') and at all utility crossings, at all fittings and valves and all changes in grade and pipe type. In addition, the Contractor shall reference all new mains by the distance to the right-of-way or property markers. The Contractor shall be held responsible for the accuracy of such data and shall bear any costs incurred in finding utilities as a result of incorrect data furnished by the Contractor.

1.07 LINE AND VALVE PLACEMENT (IF REQUIRED)

A. The Contractor and the Engineer shall inspect the location of all lines and valves in the field at the time of construction, and adjustments shall be made as directed by the Engineer.

1.08 CONNECTIONS TO EXISTING MAINS (IF REQUIRED)

A. Where connections are required between new work and existing utility mains, the connection shall be made in a thorough and first class manner, using proper fittings to suit the actual conditions. Ductile iron mechanical joint sleeve shall be used for connection to existing utility mains. When a connection is made to an existing fitting in the line, the Contractor shall schedule his work so that excavation and locating the existing fittings can be completed prior to starting trench work on the line. The Contractor shall verify the pipe outside diameter of the existing pipe with the use of a pipe tape device. Contractor shall not proceed with tie-in until all information has been confirmed with the project management staff. The Contractor shall verify the location and pipe diameters in advance so as not to delay his work with no additional compensation for this activity. Cut-ins into lines shall be done at a time approved by the Engineer. The Contractor shall not make any connections or service taps into existing utility mains until their work has been tested and accepted by the Engineer.

1.09 UTILITY SERVICE INTERRUPTIONS

A. Interruptions to utility service shall be minimized. The Contractor shall submit plans and schedules to the Owner for approval by the proper authority before any shutdown or any interruption in service takes place. After the plans and schedule for the utility service interruption shut-downs have been approved, the Contractor shall be responsible for posting shut-off notices to customers five (5) business days prior to shut down.

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B. During all phases of the stormwater pipe construction and removal, interruptions to existing services shall be kept to a minimum. No interruptions shall take place without the approval of the Owner.

1.10 GRADE OF EXISTING UTILITY MAINS

A. Grade of existing utility main as shown on the drawings are approximate. The Contractor shall field verify the grade of existing utility mains. Based on the actual grade of the existing utility mains, changes in the construction plans may be required. Discrepancies in alignment or grade shall be brought to the immediate attention of the Engineer.

1.11 UTILITY SYSTEM CODES

A. All construction shall meet or exceed the requirements of the Town of Longboat Key and Manatee County Public Works Technical Specifications. In case there is a conflict between the Code and Specification, the most stringent requirement shall be met.

1.12 SERVICES (IF REQUIRED)

A. Existing service locations, as shown on the drawings, are approximate. Upon completion of service relocation or replacement, as called for on the drawings, the Contractor shall reconnect the residential service line as directed by the Engineer, as applicable.

1.13 MAINTENANCE OF TRAFFIC (MOT)

A. Contractor shall be responsible to submit all maintenance of traffic (MOT) plans to the proper reviewing agency. It will be the Contractors responsibility to obtain approval and to set up and maintain the MOT according to the requirements of the agency having jurisdiction.

1.14 BY-PASS PIPING/PUMPING (IF REQUIRED)

A. The Contractor shall submit a by-pass plan to both the Owner and Engineer for approval. After approval by the Owner, by-pass plans can be implemented with a one (1) week notice to the Owner. The cost for all by-pass piping/pumping shall be incidental to the project; the Contractor shall bear all costs associated with this task.

1.15 WORK WITHIN TOWN OF LONGBOAT KEY RIGHTS-OF-WAY:

A. The Contractor shall refer to the latest revised editions of Manatee County and/or Florida Department of Transportation specifications and regulations for all work within private and public rights-of-way.

B. The Contractor shall notify all residents or commercial businesses along the construction route of his proposed construction schedule and coordination efforts. All existing landscaping shall be protected to the best ability of the Contractor. Contractor is responsible for replacement of impacted landscaping within the limits of construction to equal or better quality.

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C. The Contractor shall notify, by means of a door hanger, the Contractor's contact information should construction impact residents.

D. The Owner shall not be responsible to reimburse the Contractor for work around unpermitted structures as described herein.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 01 10 00

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SECTION 01 12 00 - SPECIAL PROVISIONS

PART 1 – GENERAL

The Special Provisions amend, enhance or otherwise revise the FDOT Standard Specifications and Manatee County Public Works Technical Specifications to be used for this Project.

1.01 CONTRACT PLANS

Contract Plans include the Sleepy Lagoon General Harris Street, Penfield Street, Marbury Lane. Project Plans.

1.02 STANDARD AND TECHNICAL SPEICIFCATIONS

The Standard Specifications to be used for this work shall be Division II and III of the Florida Department of Transportation (FDOT) *Standard Specifications for Road and Bridge Construction*, latest edition at time of bid, and all Supplemental Specifications thereto, hereinafter referred to as the *Standard Specifications*, for roadway construction, except as amended, enhanced or revised under this Contract per the Special Provisions, or as noted on the construction plans meeting the Manatee County Highway, Traffic & Stormwater Standards, latest edition at time of bid.

The Contractor's work shall follow the Manatee County Public Works Standards, Part 1, Utilities Standards Manual, and Technical Specifications, latest editions at time of bid, hereinafter referred to as the *Technical Specifications*, for all utility work. All items and/or materials furnished and installed shall conform to the Manatee County Utilities Approved Products List, latest edition, and supersede any items listed within the Technical Specifications for utility work. All items listed in the submittal requirements under each section shall be required to be submitted for review and acceptance by the Engineer of Record and the Town, unless otherwise specified.

The Standard Specifications and Technical Specifications cover the usual construction requirements for work specified by the Town of Longboat Key Public Works Department; however, in the event it is determined that the specific work to be done is of such a nature that the method of construction, type and/or kind of material is not defined by the Standard Specifications or Technical Specifications, such work shall be performed in accordance with the Special Provisions.

The apparent silence of the Standard Specifications, Technical Specifications or Special Provisions as to any detail or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used. Interpretation of these specifications shall be made upon that basis

1.03 GOVERNANCE ORDER

In any instance where there is an apparent conflict between the language of the Standard Specifications, Technical Specifications, Construction Plans and Special Provisions, the Special Provisions shall govern, followed by the Technical Specifications, Construction Plans and then the Standard Specifications.

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1.04 MEASUREMENT AND PAYMENT

A. All work completed under the terms of this contract shall be measured according to United States Standard Measures.

B. All measurements shall be taken horizontally or vertically unless specifically provided otherwise.

C. No payment will be made for construction over a greater area than authorized, nor for material moved from outside of stakes and data shown on the plans, except when such work is performed upon instructions of the Engineer.

D. Whenever any change, or combination of changes, on the plans results in an increase or decrease in the original contract quantities, and the work added or decreased/eliminated is of the same general character as that called for on the plans, the Contractor shall accept payment in full at the original contract unit prices for the actual quantity of work performed, with no allowance for any loss of anticipated profits.

E. It is the Contractor's responsibility to perform a detailed quantity take-off from the plans to determine actual quantities for ordering and delivery purposes. The Town will not be responsible for quantities ordered in excess of those installed and constructed. The Contractor should be aware that some of the pay items may have contingency quantities. Payment shall be made only for final in-place quantities.

No payment shall be made for contingency quantities or additional work unless otherwise directed and approved in writing by the Engineer.

F. Bid Schedule Completion - the blank spaces in the bid schedule shall be filled in correctly where each and every item for which a description is given, as the bidder must state the unit prices for which he proposes to do each part of the work contemplated, and the total price for all the parts included in any or all of the combinations of the work. In case of a discrepancy, the written words for "unit price", where stated, shall be considered as being the unit price. If the bid schedule does not use the written words for the unit price, then the numerically correct "total price", shall be considered as being the total price.

G. No separate payment will be made for the Contractor to execute Special Provisions. All expenses borne by the Contractor shall be included in the individual unit prices for the particular pay item or as specified herein.

1.05 CONTRACT CONTINGENCY

The discretionary work (Contingency) pay item shall cover the cost for various contingencies and contract amendments authorized by the Town. Any amount of extra work and/or alterations to the proposed work charged to the allowance shall be fully documented and authorized by the Project Manager before the start of the work. No payment shall be made for work completed without written authorization from the Town.

1.06 NOTICE AND SERVICE THEREOF

All notices, which shall include demands, instructions, requests, approvals, and claims shall be in writing. Any notice to or demand upon the Contractor shall be sufficiently given if delivered to the office of the Contractor specified in the bid (or to such other office as the Contractor may, from time to time, designate to the Town in writing), or if deposited in the United States mail in a

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sealed, postage prepaid envelope, or delivered, with charges prepaid, sent via fax transmission, or to any telegraph company for transmission, in each case addressed to such office.

All notices required to be hand delivered to the Town, unless otherwise specified in writing to the Contractor, shall be delivered to the Town of Longboat Key Project Manager (Project Manager), and any notice to or demand upon the Town shall be sufficiently given as delivered to the office of the Project Manager, or if deposited in the United States mail in a sealed, postage prepaid envelope, sent via fax transmission, or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to said Project Manager or to such other representative of the Town or to such other address as the Town may subsequently specify in writing to the Contractor for such purposes.

Any such notice or demand shall be deemed to have been given or made as of the time of actual delivery or (in the case of mailing) when the same should have been received in due course of post or in the case of a fax transmission or telegram at the time of actual receipt, as the case may be.

1.07 CONTRACTOR'S SUPERVISION

A. Execution of Work: The Contractor shall give the work the constant attention necessary to assure the scheduled progress. He shall cooperate fully with the Project Manager and with other Contractors at work in the vicinity.

B. Contractor's Superintendent: The Contractor shall at all times have on the work site as his agent, a competent superintendent capable of thoroughly interpreting the plans and specifications and thoroughly experienced in the type of work being performed, who shall receive the instructions from the Project Manager or his authorized representatives. The superintendent shall have full authority to execute the orders or directions of the Project Manager and to supply promptly any materials, tools, equipment, labor and incidentals that may be required. Such superintendence shall be furnished regardless of the amount of work sublet.

C. The Contractor's superintendent shall speak and understand English, and at least one responsible person who speaks and understands English shall be on the project during all working hours, and wherever work is being done by the Contractor.

D. Supervision for Emergencies: The Contractor shall have a responsible person available at or reasonably near the work site on a 24-hour basis, 7 days a week, in order that he may be contacted for emergencies and in cases where immediate action must be taken to maintain traffic or to handle any other problem that may arise. The Contractor's responsible person for supervision for emergencies shall speak and understand English. The Contractor shall submit, by certified mail, phone numbers and names of personnel designated to be contacted in cases of emergencies along with a description of the project location to the Florida Highway Patrol and all other local law enforcement agencies.

1.08 LIST OF EMERGENCY CONTACT NUMBERS & UTILITY SERVICE MAINTENANCE

The Contractor shall obtain and maintain a list of emergency contact phone numbers for all utilities during the course of the project. The Contractor shall maintain utility service during the project except for interruptions authorized by the utility owner. If interruptions are required, the Contractor shall notify the Project Manager 48 hours in advance.

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1.09 SHOP DRAWINGS

The Contractor shall submit all working drawings and shop drawings with descriptive specifications and engineering calculations necessary for the successful completion of the Project in pdf format for review and approval by the Engineer of Record (EOR). Each shop drawing shall have a cover sheet and reference the submittal number.

For items that do not meet current FDOT specifications, any working drawings shall be certified by a Florida licensed Professional Engineer and state that the design is sufficient for the successful completion of the Work. Shop drawings do not require the signature, date and seal of a professional engineer.

1.10 SUBSTITUTIONS

Contractor shall reimburse Owner for the charges of Engineer and Engineer's consultants for evaluating each proposed substitute submitted after the effective date of the Agreement and all costs resulting from any delays in the work while the substitute was undergoing review.

Whenever a material or article required is specified or shown on the plans by using the name of the proprietary product or of a particular manufacturer or vendor where an "or equal" is allowed, it is done for the purpose of establishing a standard of quality for the specified materials. Where an "or equal" is not specified, no other material or article may be substituted. Any material or article of which the specifications allow for an “or equal”, it shall perform the duties imposed by the general material or article and be of equal substance, form and function in the opinion of the Engineer. Such substitutions shall not be purchased or installed without written approval of the Engineer. Time extensions will not be granted for any delays encountered in the procurement, shipment or installation of substitutions.

1.11 SITE INVESTIGATION

The Contractor shall satisfactorily acquaint himself to the nature and location of the work; the general and local conditions, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials; availability of labor, water, electric power, roads; and uncertainties of weather, water stages, tides or similar physical conditions at the site; the conformation and conditions of the ground; the character of equipment and facilities needed preliminary to, during prosecution of the work, and for project close out.

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 presented by the drawings and Specifications made a part of this contract.

The Contractor shall carefully review and adhere to conditions and recommendations made in the project geotechnical report. 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 Town assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the Town. The Town also assumes no responsibility for any understanding or representations made by its officers or agents during or prior to the execution of this Contract, unless (1) such understanding or interpretations are made in writing by the Engineer or are expressly stated in the Contract and (2) the Contract expressly provides that the responsibility therefore is assumed by the Town.

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1.12 SEQUENCE OF CONSTRUCTION

Prior to the start of the Work described in this contract, a pre-construction conference may be held by the Project Manager to be attended by the Contractor, Town staff, Engineer, other consultants, representatives of the various utilities, and others as required, for the purpose of establishing a schedule of operations and to coordinate the work to be done under this contract with all related work to be done by others within the limits of the project.

All items of work in this contract shall be coordinated so that progress of each related item will be continuous from week to week. The progress of the work will be reviewed by the Project Manager at the end of each week, and if the progress of any item of work during that week is found to be unsatisfactory, the Contractor shall be required to adjust the rate of progress on that item or other items as directed by the Project Manager without additional compensation. The Contractor will continuously control the work until completed.

The Contractor shall submit a detailed Critical Path Method (CPM) construction schedule within 15 days of the notification of award for the Project Manager to review. The submittal shall meet the following requirements:

a. The schedule shall be submitted in PDF format sized to be printed on 11-inch by 17-inch paper.

b. The time scale (horizontal) shall be in weeks. The activities shall be listed on the left-hand side (vertical).

c. Activities shall show most Work activities. The listing from top to bottom shall be in a logical sequence of how the Work will be accomplished. Space shall be provided between activities or within bars to allow for marking of actual progress.

A copy of the CPM schedule, clearly showing progress made, shall be submitted with each monthly pay application. Review or acceptance will neither impose on the Town responsibility for the progress or scheduling of the Work, nor relieve the Contractor from full responsibilities. The Contractor shall provide a revised schedule if, at any time, the Town considers the completion date to be in jeopardy because of “activities behind schedule”. An activity that cannot be completed by its original or latest completion date shall be deemed to be behind schedule. The revised schedule is designed to show how the Contractor intends to accomplish the Work to meet the contractual completion date. The form and method employed by the Contractor shall be the same as for the original schedule. The cost to prepare and revise the schedule is considered incidental to the Work.

1.13 NIGHT CONSTRUCTION

Nighttime construction will not be permitted unless specifically authorized in writing by Town of Longboat Key and only for limited items of work. No separate payment will be made for nighttime construction.

1.14 ACCESS TO RESIDENTIAL PROPERTIES AND BUSINESSES

Full access to businesses and residences are of primary importance to Town of Longboat Key on this project. Therefore, the Contractor shall take all necessary measures to provide this access throughout construction. These measures include all other efforts as required to facilitate Pedestrian and vehicular traffic. No separate payment will be made.

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1.15 OPEN EXCAVATIONS

A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by vehicles, pedestrians and workmen. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Owner may require special construction procedures such as limiting the length of open trench and prohibiting stacking excavated material in the street. Access to driveways must be maintained as soon as practical by the Contractor.

B. Trenches shall not remain open overnight.

C. The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles, which could be dangerous to the public shall be barricaded and well lighted at all times when construction is not in progress.

D. The maximum length of open trench shall be 40 feet at any one time.

1.16 UTILITY SYSTEMS AND FACILITIES

A. The Contractor shall be responsible for coordination of the work with all affected utility owners. The Contractor must take into consideration the required utility adjustments and relocations in development of his schedule for completing the work including construction of temporary work to allow phased construction of the permanent facilities.

B. The Contractor shall field verify existing underground utility locations by means of subsurface locating or other approved method. All existing utilities shall remain unless otherwise noted on the plans. The Contractor shall locate all existing utilities to remain at potential conflict locations prior to construction activities and before ordering any proposed structures. The Contractor shall contact and coordinate with "Sunshine State One Call 811" as well as the individual utilities prior to and during construction for utility locations, relocation and assistance while installing in potential conflict areas. All utility coordination and relocations shall be factored into the Contractor’s construction schedule at no additional cost to the Town.

The cost of all labor, materials and incidentals required for the performance of any survey and utility location work shall be included as part of the lump sum quantity under the pay item for Mobilization. A Florida Registered Professional Surveyor and Mapper shall perform all survey work.

C. The Contractor shall hold a utility owner’s meeting every two weeks / or alternate time schedule agreed to by the Town. The meeting shall review current and upcoming activities for the project. Written meeting minutes will be prepared by the Contractor and distributed to the meeting participants within 3 calendar days of the meeting.

D. It shall be the Contractor's responsibility to avoid conflicts with other utilities. The Town will not be responsible for additional costs incurred by the Contractor for incorrect installations, relocations and breaks due to service conflicts. The Contractor’s equipment shall maintain a minimum clearance distance to the power line following the latest OSHA and FDOT Roadway Design Bulletin.

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E. The Contractor shall minimize the interruption of water, telephone, power, cable TV, sewer, gas or other related utility services and disturb the normal functioning of the system as little as possible. He shall notify the appropriate agency well in advance of any requirements for dewatering, isolating, or relocating a section of a utility, so that necessary arrangements may be made with the appropriate agency.

F. The Contractor shall bear full responsibility for obtaining locations of all underground structures and utilities (including existing water services, drain lines, and sewers). Services to buildings shall be maintained. All costs or charges resulting from damage to any utility or structure shall be paid by the Contractor at no additional cost to the Owner.

G. Protection and temporary removal and replacement of existing utilities and structures as described in this Section shall be a part of the work under the Contract and no separate payment will be made for this work.

H. If permanent relocation of a utility owned by the Owner is required, he may direct the Contractor in writing, to perform the work. Work so ordered will be paid for at the contract unit prices, if applicable, or as extra work. If relocation of a privately owned utility is required, the Owner will notify the utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the Owner and utility and shall have no claim for delay due to such relocation. The Contractor shall notify all utility companies in writing at least 48 hours (excluding Saturdays, Sundays, and legal holidays) before excavating near their utilities.

I. The Contractor shall be responsible to maintain water, telephone, power, cable TV, sewer, gas and other related utilities throughout construction at no additional cost to the Owner.

J. The Contractor shall fully cooperate with all private and public utilities during the installation of new facilities, or relocation of existing facilities. The Contractor shall coordinate his work accordingly and shall have no claim except for time extension for delays associated with the proposed utility improvements.

K. The Contractor shall be fully responsible for providing all temporary piping, electrical hook-ups, lighting, temporary structures, or whatever is required to maintain the existing utility systems. All details of temporary piping and temporary construction are not necessarily shown on the Drawings or covered in the Specifications. However, this does not relieve the Contractor of the responsibility to ensure that construction will not create unacceptable interruptions.

1.17 TEST PITS

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

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1.18 CARE AND PROTECTION OF PROPERTY

The Contractor shall cooperate with the owners of any underground or overhead utility lines in their removal and rearrangement operations, in order that these operations may progress in a reasonable manner and that service rendered by these parties will not be interrupted. The Town shall not be responsible for costs associated with delays, disruptions and remobilizations attributed to utility agency scheduling.

The Contractor shall coordinate with owners of driveways impacted by construction to maintain access as required by the property owner. Contractor shall make every effort not to disrupt business access during business operation hours unless otherwise approved by the business owner or the Town in advance of the work being performed.

The Contractor shall coordinate impacts with property owners abutting the project area and shall make every effort to expedite the work to minimize the duration of the impacts. Contractor is responsible for daily cleanup, access, and reimbursement or restoration of any damages done to the property by the Contractor and their subcontractors to the satisfaction of the property owner. It is important to keep pre- and post-construction photos of the work areas.

A. The Contractor shall be responsible for the preservation of all public and private property and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in another manner acceptable to the Engineer.

B. All sidewalks, curbing and driveways, which are disturbed by the Contractor's operations, shall be restored to their original or better condition by the use of similar or comparable materials.

C. Along the location of the work, all walks, bushes, trees, shrubbery and other physical features shall be protected and restored to their original or better condition by use of similar or comparable materials. Fences and other features removed by the Contractor shall be replaced in the location indicated by the Engineer as soon as conditions permit. All grass areas, which have been damaged by the Contractor, shall be regraded, and sodded or seeded and mulched as directed by the Engineer.

D. Trees close to the work shall be boxed or otherwise protected against injury. The Contractor shall trim all branches that are liable to damage because of his operations, but in no case shall any tree be cut or removed without prior notification of the Engineer. All injuries to bark, trunk, limbs and roots of trees shall be repaired by dressing, cutting, and painting according to approved methods, using only approved tools and materials.

E. The protection, removal, and replacement of existing physical features along the line of work shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the lump sum prices established under other items in the Proposal.

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1.19 USE OF PRIVATE PROPERTY

All construction activities required to complete this project in accordance with the Contract Documents shall be confined to public right-of-way, easements of record, access agreements or temporary construction easements, unless the Contractor makes specific arrangements with private property owners for his use of their property. Written authorization from the granting property owner shall be placed on file with the Project Manager prior to utilization of said private properties. The Town assumes no responsibility for damage to private property in such instances. The Contractor is responsible for protection of private property abutting all work areas on this project. Adequate equipment storage and material storage shall also be accomplished outside the Town's right-of-way. Pipe and other materials shall not be strung out along the right-of-way but will be delivered in quantities adequate for one day's installation.

1.20 MAINTENANCE OF STORM DRAINAGE SYSTEM

The Contractor shall be responsible to maintain the operation of existing stormwater facilities, or, when existing stormwater facilities are removed, to provide, as necessary, temporary alternate forms of equivalent stormwater conveyance and storage capacity to adequately prevent upstream flooding in excess of existing conditions. This responsibility shall include the installation of temporary connections, bypass pumping, or other temporary means necessary until the new drainage system is fully operational. Payment for these items shall be included under the applicable pay item for new storm systems.

1.21 CLEAN-UP

During the course of the work, the Contractor shall keep the site of his operations in as clean and neat of a condition as is possible. He shall dispose of all residue resulting from the construction work and, at the conclusion of the work, he shall remove and haul away any surplus excavation, broken pavement, brick, lumber, equipment, temporary structures, and any other refuse remaining from the construction operations, and shall leave the entire site of the work in a neat and orderly condition.

1.22 MAINTENANCE OF TRAFFIC (MOT)

The Contractor shall provide continuous access to local businesses during operational hours, or as acceptable to the business owners, and shall coordinate with residents on access to their properties. Lane closures with major disruption or delays must include alternating traffic and are only permitted under special approval of the Town, closure will be on a case by case basis. Construction hours should be per Town's noise ordinances (8:00 AM to 5:00 PM Monday to Saturday). No work on weekends or legal holidays without prior written approval of the Town Project Manager, except emergency work, will be allowed. Road closures are not allowed between the hours of 7:00 AM to 7:00 PM per County Ordinance unless prior written approval is provided by the Town. Temporary by-pass lanes may be constructed at all tie-in locations during the MOT phasing. The payment for temporary by-pass lanes shall be included in Maintenance of Traffic pay item, as previously described. Business Entrance signs per FDOT Standard Plans Index 102- 600 shall be placed at all business entrance points and maintained during all phases of construction. Payment for these items shall be included under the pay item for Maintenance of Traffic.

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Temporary pavement marking shall be paid under the Maintenance of Traffic pay item, in accordance with FDOT Standard Specifications Section 102.

If there are any impacts to existing traffic lanes, the Contractor shall prepare and submit to the Town for approval, a Maintenance of Traffic plan to obtain a Right-of-Way Utilization Permit. This Maintenance of Traffic plan shall either be provided in the construction plans or be prepared in accordance with FDOT Standard Specifications Section 102-4. Lane and road closures require approval from the Public Works Director having ultimate approval authority.

1.23 PEDESTRIAN ACCESS MAINTAINED

Existing pedestrian access shall be maintained throughout construction unless approved by the Engineer and Town.

Temporary sidewalk shall be constructed as shown in the plans or as required to maintain pedestrian movement. Payment for these items shall be included under the lump sum pay item for Maintenance of Traffic.

If the Contractor, in the process of performing his contract operations, breaks any of the existing sidewalk that is to remain in place, replacement of this sidewalk will be at the Contractor's expense.

1.24 WORKSITE TRAFFIC SUPERVISOR

A. The Contractor shall have a Worksite Traffic Supervisor who will be responsible for initiating, installing and maintaining all traffic control devices as described in Section 102 of the FDOT Standard Specifications and in the Plans. The Worksite Traffic Supervisor shall have at least one year of experience directly related to work site traffic control in a supervisory or responsible capacity and shall be certified by the American Traffic Safety Services Association Worksite Traffic Supervisor Certification Program or an equal approved by FDOT. Approved alternate Worksite Traffic Supervisors may be used when necessary.

B. The Worksite Traffic Supervisor shall be available on a 24-hour per day basis and shall review the project on a day-to-day basis as well as being involved in all changes to traffic control. The Worksite Traffic Supervisor shall have access to all equipment and materials needed to maintain traffic control and handle traffic-related situations. The Worksite Traffic Supervisor shall ensure that routine deficiencies are corrected within a 24-hour period.

C. The Worksite Traffic Supervisor shall be available on the site within 45 minutes after notification of an emergency situation, prepared to positively respond to repair the work zone traffic control or to provide alternate traffic arrangements.

D. Failure of the Worksite Traffic Supervisor to comply with the provisions of the Sub- article may be grounds for decertification or removal from the project or both. Failure to maintain a designated Worksite Traffic Supervisor or failure to comply with these provisions will result in temporary suspension of all activities except traffic and erosion control and such other activities deemed to be necessary for project maintenance.

E. Payment for Worksite Traffic Supervisor shall be included under the pay item for Maintenance of Traffic.

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1.25 PROTECTION OF CONSTRUCTION AND EQUIPMENT

A. All newly constructed work shall be carefully protected from injury in any way. All portions injured shall be reconstructed by the Contractor at his own expense.

B. All structures (existing and proposed) shall be protected in a manner approved by the Engineer. Should any of the structures become heaved, cracked, or otherwise damaged, all such damaged portions of the work shall be completely repaired and made good by the Contractor, at his own expense, and to the satisfaction of the Engineer.

If, in the final inspection of the work, any defects, faults, or omissions are found, the Contractor shall cause the same to be repaired or removed and replaced by proper materials and workmanship without extra compensation for the materials and labor required. Further, the Contractor shall be fully responsible for the satisfactory maintenance and repair of the construction and other work undertaken herein, for at least the guarantee period described in the Contract.

C. The Contractor shall take all necessary precautions to prevent damage to any structure due to water pressure during and after construction and until such structure is accepted and taken over by the Owner.

1.26 THE FLORIDA TRENCH SAFETY ACT

The Contractor shall adhere to the requirements of the Florida Trench Safety Act, and O.S.H.A. Excavation Safety Standards 29 CFRs 1926.650 Subpart P.

1.27 EMERGENCY VEHICLE NOTIFICATION

The Contractor shall notify the police, fire department and ambulance service of the proposed construction schedule one (1) week in advance of the proposed work.

1.28 DEWATERING, SHEETING AND BRACING

The Contractor shall determine the need of dewatering, sheeting and bracing to facilitate the construction, conforming to current SWFWMD/FDEP rule and OSHA safety criteria. Payment for dewatering, sheeting, and bracing shall be incidental to the applicable manholes, structures, and pipe pay items.

At least 10 days prior to the commencement of any dewatering activity, the Contractor shall obtain the approval from SWFMWD, or FDEP (if water needs to be discharged offsite into the state surface water), and submit the permit with a detailed description of the proposed dewatering system to the Project Manager. The dewatering plan shall include design computations, layout, type, and spacing of dewatering devices, number and size of pumps and other equipment, with a description of the installation and operating procedures.

1.29 SUBMITTAL DATA

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The Contractor shall be required to submit a minimum of six (6) copies of pertinent information, Shop drawings and literature on all materials and items of equipment to be installed in conjunction with these specifications.
Before ordering or installing any of the equipment or materials, the Contractor shall have one (1) copy of submittal data on each item approved by the Engineer in writing and returned to him. The Engineer will retain three (3) copies; therefore, if the Contractor wishes to have more copies, he shall submit the additional copies.

1.30 PROJECT IDENTIFICATION SIGNS

The Contractor shall be responsible for furnishing, installing and maintaining project identification signs and for the removal upon completion of the construction. The sign shall be installed prior to the commencement of work. Sign locations will be coordinated with the Town Inspector to ensure maximum public visibility and to avoid conflicts and unsafe conditions in accordance with Manatee County Land Development Code, Section 1002 - Visibility Triangles. Signs shall be posted at each end of the project or in the direction of visibility to the most traffic. The Contractor shall relocate the sign as directed by the Owner for the duration of the Project.

The signs shall be a minimum of 8 feet wide and 4 feet high mounted on 4-inch by 4-inch pressure treated lumber. The signs shall be constructed of high density ¾-inch exterior plywood, or equivalent with approval from the Town, without waves or buckles, mounted and braced with pressure treated lumber as necessary and maintained in a presentable condition for the duration of the project. Hardware shall be galvanized. The surface of the sign shall be of either an overlay or laminate mounted on the plywood.

The information to be provided on the signs shall include and be formatted per the following project identification sign template. A digital copy of the template will be provided to the Contractor by the Town. The contractor shall submit the final template as a shop drawing. Payment for installing and maintaining the project identification signs shall be included as part of the lump sum quantity under the pay item for Mobilization. The sign will remain the property of the Town upon completion of the Project unless otherwise directed.

FLOOD MITIGATION CONSTRUCTION FOR SLEEPY LAGOON:
GENERAL HARRIS STREET, PENFIELD STREET, MARBURY LANE

Town of Longboat Key Commissioners

GARY COFFIN	DISTRICT 1		VICE MAYOR PENNY GOLD	DISTRICT 2
NICK GLADDING	DISTRICT 3		MAYOR DEBRA WILLIAMS	DISTRICT 4
SARAH KARON	DISTRICT 5		B.J. BISHOP	AT-LARGE
STEVE BRANHAM	AT-LARGE			

CONSTRUCTION COST $(ENTER AMOUNT)		PRIME CONTRACTOR (ENTER CONTRACTOR NAME)

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1.31 INSPECTIONS SCHEDULED BY CONTRACTOR

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

Reinforcing steel prior to concrete placement.

Placement of concrete and concrete structures.

Paving operations.

Directional Drilling.

Gravity Sanitary Sewer.

Abandonment and/or Removal of Existing Sewer System.

Hydrostatic tests of pressure pipe work.

Pipeline testing.

Final clean up of sites.

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

1.32 CONSTRUCTION PHOTOGRAPHY

A. **General:** The Contractor shall employ a competent photographer to take pre-construction and construction progress record photographs and perform video recording, in digital format, including providing all labor, materials, equipment and incidentals necessary to obtain photographs and/or video recordings of all areas specified in the Contract specifications.

B. **Qualifications:** A competent camera operator who is fully experienced and qualified with the specified equipment shall do all photography. For the video recording, the audio portion should be done by a person qualified and knowledgeable in the specifics of the Contract, who shall speak with clarity and diction so as to be easily understood.

C. **Project Photos for Construction Progress:** Provide construction progress photos of the entire work area during construction for the purpose of creating records of completed work. Photos should be spaced at approximately 100-foot intervals or as needed to properly document the completed work. Digital photographs shall be provided to the Town with the monthly pay applications

The Contractor shall pay all costs associated with the required photographs. Any parties requiring additional photography will pay the photographer directly. All project photos shall be taken from locations to adequately illustrate conditions prior to construction, or conditions of construction and state of progress. The Contractor shall consult with the

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Town's Representative at each period of photography for instructions concerning views required.

The Contractor shall deliver photos in conformance with the above requirements to the Town's Representative. No construction shall begin until pre-construction photos and video recordings are completed and submitted to the Town's Representative

D. **Record Photos:** The Contractor shall require that photographer maintain digital copies of photos for a period of three years from date of Substantial Completion of the Project. Photographer shall agree to furnish prints to the Town's Representative at commercial rates applicable at the time of purchase. Photographer shall also agree to participate as required in any litigation requiring the photographer as expert witness.

E. **Video Recording for Pre-Construction:** Video recording shall be used in lieu of photos for pre-construction. It shall be of sufficient quality to fully illustrate details of conditions and construction, including special features.

Video recording shall be accomplished along all routes that are scheduled for construction. The video recording shall, when viewed, depict an image with ¼ of the image being the roadway fronting of property and ¾ of the image being of the property. The video recording shall be done so as to show the roadway and property in an oblique view (30 degrees). A complete view, in sufficient detail, of all driveways, with audio description of the exact location shall be provided. The Engineering plans shall be used as a reference for stationing in the audio portion of the video recording for easy location identifications. If visible, house numbers shall be mentioned on the audio.

A complete set of video recordings shall be submitted for the permanent and exclusive use of the Town prior to the start of any construction on the project. All video recordings shall contain the name of the project, the date and time of the video recording the name and address of the photographer and any other identifying information required.

Payment for this item shall be included as part of the lump sum quantity under the pay item for Mobilization.

1.33 PERMITS

The Contractor shall obtain the necessary construction permits required by the Town of Longboat Key, FDEP, and EPA prior to constructing the Work. Prior to proceeding with construction, the Contractor shall prepare and submit a "Notice of Intent to Use Generic Permit for Stormwater Discharge from Construction Activities that Disturb One or More Acres of Land" to the Florida Department of Environmental Protection (FDEP). The Contractor shall monitor the site at all times and take appropriate action to prevent erosion including the use of BMPs. No pumping of ground or surface water shall be performed without approval from the Water Management District.

Following completion of construction, Contractor shall prepare and submit a "Notice of Termination of Generic Permit Coverage" to FDEP. Payment for this item shall be included as part of the lump sum quantity under the pay item for Mobilization.

Southwest Florida Water Management District Stormwater Management and Discharge permits or exemptions, if any, and/or a Department of Environmental Protection Dredge and Fill permit, if any, required for this project have been obtained by the Town. The Contractor shall comply with the stipulations of the Permits or Exemptions as stated herein.

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The Contractor shall allow periodic inspection of the work by authorized representatives of the Florida Department of Environmental Protection, the Southwest Florida Water Management District, as well as other duly authorized law enforcement officers of the State.

The Contractor shall post all permits in a conspicuous location.

1.34 EARTHWORK

Quantities included in the contract plans and bid form represent estimated in-place quantities and do not include shrinkage and expansion factors unless otherwise specified. Payment for Earthwork under pay item 0120 1 - Regular Excavation and pay item 0120 6 - Embankment shall be made based on average end area method calculations or by other methods as approved by the Engineer and Town. Contractor shall provide supporting survey data (before and after cross-sections) and calculations for payment purposes.

The ownership of excavated materials shall be by the Town unless otherwise specified in the contract documents.

1.35 GEOTECHNICAL REPORT

The Contractor shall refer to the geotechnical reports prepared by Universal Engineering Sciences (dated April 1, 2015 and July 30, 2015) for determination of existing conditions in preparing his bid and for performing the Work.

1.36 DEWATERING

The Contractor is responsible for all necessary dewatering and proper methods to dispose the surplus water. All dewatering activities shall meet SWFWMD, Town of Longboat Key, Manatee County Public Works and Utilities Standards, and all other applicable agency requirements and permit conditions.

1.37 DUST CONTROL

The Contractor shall provide adequate dust control at no additional cost to the Owner.

1.38 SOIL EROSION AND SILTATION

The Contractor shall plan and control the Work to minimize all soil erosion and siltation. At the pre-construction meeting, the Contractor shall present his proposed plan and schedule, which shall specifically indicate the proposed usage of temporary erosion control features if they vary from the plans.

1.39 THERMOPLASTIC TRAFFIC STRIPES AND MARKINGS

The application of thermoplastic traffic stripes and markings on newly constructed final surface courses shall be in accordance with current FDOT specifications. The Engineer may require longer asphalt cure periods, if specified in the construction plans.

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Provide temporary pavement markings during the interim period if the road is open to traffic. The price of temporary pavement marking shall be included in the Maintenance of Traffic.

1.40 CRUSHED CONCRETE BASE

Crushed Concrete Base shall follow the most current FDOT Standard Specifications, Section 911. The layer coefficient of 0.18 with Limerock Bearing Ratio (LBR) minimum 150 is allowed to calculate the base thickness if from an FDOT approved source and meeting FDOT specifications.

A. **Material source inspection**: Prior to acceptance of base product, a representative of the Town may visit the Producer's location and obtain a sample of the proposed base for the specified project at the discretion of the Town. In addition to sampling, the pile will be visually inspected for deleterious materials, substantial segregation, or any other undesirable characteristics. The pile shall have a traceable identification by pile number or lot number and an accurate quality assessment.

B. **Regarding source approval**: FDOT approved source, allocated lot sufficient to serve project's needs, delivery tickets stating FDOT approved source, project name, FDOT preapproved lot or pile number.

C. **Import and placement of base product**: During import of base product, a Town inspector or duly designated representative of the Town will be onsite monitoring incoming loads, making visual assessments of the product and checking load tickets for verification of materials.

After spreading out, prior to compacting, samples of the base product will be obtained by the Contractor's approved testing lab, every 500 LF, or as directed by the Town, staggering right, left, center of the roadway for Limerock Bearing Ratio, gradation and deleterious material testing.

A. **Deleterious materials**: Deleterious material content in addition to the FDOT Specifications 2020 (July), Section 911, should state that no construction debris such as Styrofoam insulation, telephone wire, lumber, shingles, aluminum window or door frames, etc., or household trash ie: bottles, cans, paper goods etc. is acceptable.

B. **Rejection of materials**: Material not meeting above requirements will subject to rejection and be removed from the project site. Any three (3) concurrent rejections will require immediate shut down of imported material and require review and remedies prior to restart.

C. **Compaction of material**: In place material shall achieve 98% of AASHTO T-180 compaction.

1.41 TEMPORARY PAVEMENT

Temporary pavement shall consist of a minimum of Optional Base Group 4 and ¾-inch of Type S-III structural course over a firm, unyielding, well-compacted subgrade, or as specified in the contract plans, if greater. If the temporary pavement is not specified in the contract plans, the proposed pavement section shall be submitted to the Town for review. The Contractor shall immediately repair all potholes that develop within the project limits and shall maintain a supply of cold mix on the project site to expedite these repairs.

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Temporary by-pass roads shall provide adequate cover and protection of existing utilities. It is the Contractor's responsibility to coordinate with utility companies to repair any damages to the exiting utilities during the construction at no additional cost to the Town. Payment for temporary pavement and maintenance of this pavement shall be included under Maintenance of Traffic. A breakdown of the temporary road quantities in the lump sum MOT pay item shall be provided by the Contractor.

1.42 STORMWATER DRAINAGE PIPES AND STRUCTURES

All proposed storm structures shall have a wall thickness no less than 6 inches. Metal storm pipe or metal mitered end section shall not be used in the road right of way or carry right of way runoff.

1.43 POST CONSTRUCTION STORMWATER DRAINAGE PIPE TESTING

The Contractor shall inspect and televise all newly constructed storm pipes, structures, new connections, and any existing storm pipe systems identified to be cleaned in the construction plans. Video DVD and report shall be provided for those pipes whose diameters are equal or smaller than 48 in, with Laser profile data included for newly installed non-RCP pipes, following FDOT Specifications latest version. The purpose is to assure the pipes are properly constructed and do not leak at the joints. Payment for this item shall be included as incidental to the cost per foot of new storm pipe installed.

1.44 CONSTRUCTION STAKING

All construction staking and survey work shall be completed by a Florida Registered Professional Surveyor and Mapper. The right-of-way shall be staked prior to Clearing and Grubbing activities and shall include all easements (TCE or permanent) and maintained through the duration of construction. Right-of- way stakes shall be placed at all right-of-way corners and a maximum of 200 feet between corners, and shall be visible for Contractor personnel, utility companies, and Town representatives.

1.45 MAINTENANCE AND RESTORATION OF JOB SITE

The Contractor shall conduct his operations in such a manner as will result in a minimum of inconvenience to occupants of adjacent homes, business establishments and the general public, and shall provide temporary access as directed or as may be required by the Project Manager. All final restoration must be performed to an equal or better condition than that which existed prior to construction.

Good housekeeping on this project is extremely important, and the Contractor will be responsible for keeping the construction site neat and clean, with debris being removed daily as the work progresses or as otherwise directed by the Project Manager. Good housekeeping at the job site shall include mowing as necessary to prevent grass and other vegetation within the work area from exceeding 18 inches in height or causing unsafe conditions; removing all tools and temporary structures, dirt, rubbish, etc.; hauling all excess dirt, rock, etc., from excavations to a dump provided by the Contractor; and all clean up shall be accomplished to the satisfaction of the Project Manager. Each Friday, the Contractor shall prepare the road surface and barricades in an acceptable manner for weekend traffic use. Immediately after construction completion in an area or part thereof (including restoration), barricades, construction equipment and surplus and discarded materials shall be removed by the Contractor.

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If timely housekeeping and restoration of the job site is not accomplished to the satisfaction of the Town, the Town shall make arrangements to affect the necessary housekeeping and restoration by others. The Contractor shall be charged for these costs through deductions in payment due the Contractor. If such action becomes necessary on the part of and in the opinion of the Town, the Town shall not be responsible for the inadvertent removal from the work site of materials which the Contractor would not normally have disposed of had he affected the required clean-up.

1.46 RESTORATION

Payment for restoration shall be covered under the applicable restoration Pay Items as specified in the proposal. If a specific restoration Pay Item is not listed in the proposal, the cost of such work shall be included in the applicable Pay Item unless otherwise provided under separate restoration section or pay quantity of these Specifications.

1.47 HURRICANE PREPARENESS

Within 30 days of the Contract award, the Contractor shall submit to the Town for approval a Hurricane Preparedness Plan. The plan should outline the necessary measures which the Contractor proposes to perform, at no additional cost to the Town, to prepare and secure the project site prior to a hurricane event and to recover the project site after a hurricane event.

In the event of inclement weather, or whenever the Town shall direct, the contractor shall ensure the work and materials shall carefully be secured and protected against damage or injury from the weather. If, in the opinion of the Town, any portion of work or materials is damaged due to the failure on the part of the contractor or subcontractors to protect the work, such work and materials shall be removed and replaced at the expense of the Contractor.

1.48 STANDARDS

All work shall meet or exceed Town of Longboat Key, Manatee County Public Works and Utilities Standards, and other applicable agency standards.

1.49 LABORATORY TESTING

Testing for the Work shall be performed at no expense to the Town. The testing laboratory shall be approved by the Town.

The samples and tests used for determining the quality and acceptability of the materials and workmanship, which have been or are to be incorporated in the Work, shall conform to the requirements of the State of Florida Department of Transportation Materials Sampling, Testing and Reporting Guide, latest edition.

Testing shall also be in accordance with the applicable portions of the *FDOT Standard Specifications* and the Technical Specifications.

1.50 UTILITY SERVICES

All utility services required by the Construction Manager for the work shall be at the Construction Manager’s expense including water, sewer, telephone, power, etc.

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1.51 FILL MATERIAL

Delivery Tickets: A copy of all delivery tickets for materials used on the project, regardless of the basis of payment shall be provided to the Town upon request.

Job Mix Formula for Asphaltic Concrete: Job mix formulas for asphaltic concrete, of the type specified, shall be submitted at least 14 days before plant operations begin. The submitted formula should be derived from or approved by the laboratory approved by the Town and/or its agents. Costs for such job mix formulation will be paid by the Contractor directly to the assigned laboratory.

Job Mix Formula for Portland Cement Concrete: Job mix design formulas for all Portland Cement Concrete, of the type specified, shall be submitted at least 14 days prior to use on the project. The submitted formulas shall be derived from or approved by the Town and/or its agents. All concrete mix designs shall meet FDOT Concrete Class mix guidelines, except as follows: when approved, in writing by the Engineer, an Alternate Class I Concrete mix design formula, for concrete curb and gutter to be placed by automated curb machines, may show, as a substitution for #57 aggregate, an amount of #89 aggregate not to exceed 33 percent, by weight, of the #57 aggregate.

1.52 RECORD DRAWINGS AND PROJECT CERTIFICATION

The Town will furnish the Contractor copies of the bid plans (AutoCAD files) to be used for the Record Drawings. A Florida Registered Professional Surveyor and Mapper shall perform a field survey and any differences between the plan elevations or dimensions shall be marked through and the as-built elevation or dimension legibly entered. All elevations and dimensions that are correct shall have a check mark placed beside it.

The Contractor shall keep a complete set of surveyed “As-built” records. These records shall show all items of Work and existing features of utilities revealed by excavation work. The records shall be kept in a professional manner, in a form that shall be approved by the Town prior to the Work. These results shall be available at all times during construction for reference by the Engineer and shall be delivered to the Engineer upon completion of the Work. All completed “As-builts” must be certified by a Florida Registered Professional Surveyor and Mapper or Engineer per Chapter 61 G 17-6, Florida Administrative Code, pursuant to Sec. 47207, Florida Statutes.

The Record Drawings shall be prepared in accordance with the requirements of the Manatee County Public Works Standards, Parts 1 and 3, latest edition at time of project completion and shall be submitted at time of Substantial Completion. The Engineer will review and approve the Record Drawings prepared by the Contractor’s surveyor within 30 days of submittal unless additional information is required.

Following completion of construction and prior to final payment, the Contractor shall submit a Certification by the Contractor and Manufacturer including test data that the materials (filter fabric, filter media, etc.) installed, meet plan specifications and regulatory requirements.

All Digital Drawings shall be identical to those submitted as hard copy. The Digital Drawing files shall be provided in AutoCAD .DWG format, current version, and shall include all external reference drawings, text fonts, shape files and all other files necessary to make use of the drawings.

Unless there is a separate pay item for Record Drawings, payment shall be included as part of the lump sum quantity under the pay item for Mobilization.

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PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 01 12 00

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SECTION 01 13 00 - MEASUREMENT AND PAYMENT

PART 1 – GENERAL

Clarifications are provided below of specific line items on the Bid Form to identify the Town's requirements of what is to be included in the line item and/or how it is to be paid. Where a FDOT Pay Item number is indicated for a line item, the clarification is provided to amend, enhance or otherwise revise the FDOT pay item description to meet the Town's requirements for the project. Where a FDOT pay item number is not indicated, the clarification shown herein is provided to amend, enhance or otherwise revise the pay item description provided in the Technical Specifications to meet the Town's requirements for the project. For line items that are not included in either the FDOT or Manatee County Specifications, the pay item description provided herein shall govern.

1.1 GENERAL

All Contract Prices included in the Schedule of Values and Schedule of Bid Items section will be full compensation for all labor, materials, tools, equipment and incidentals necessary to complete the construction as shown on the drawings and/or as specified in the Contract Documents to be performed under this contract. Payment for all items listed in the Bid Form will constitute full compensation for all work shown and/or specified to be performed under this project.

1.2 SCHEDULE OF VALUES

The Contractor is required to submit a Schedule of Values for each lump sum bid item as detailed in the "Schedule of Values". This Schedule of Values will be used to compensate the Contractor for extra work approved by the Owner, or used to reduce the contract price for work eliminated by the Owner. The Schedule of Values shall be submitted with the Contractor's bid. The Schedule of Values must properly reflect the work involved. Should the Schedule of Values be unbalanced or unrealistic, as determined by the Engineer, the Contractor shall modify the value associated with the appropriate items of work. The Owner retains the right to negotiate all Schedule of Values which may be unbalanced or unrealistic.

1.3 WORK OUTSIDE AUTHORIZED LIMITS

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

1.4 MEASUREMENT STANDARDS

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

1.5 AREA MEASUREMENTS

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

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1.6 LUMP SUM ITEMS

Payment for specific items of work shall be paid for on a lump sum basis. No separate payment will be made for any item of work required to complete the lump sum item. Lump sum bid items shall be complete, tested and fully operable prior to request for final payment.

1.7 UNIT PRICE ITEM

This project is not a unit price contract. Refer to paragraphs 1.2 and 1.6. Any related work not specifically listed, but required for satisfactory completion of the work shall be considered to be included in the scope of the appropriate listed work items.

1.8 OTHER PROVISIONS

No separate payment will be made for the following items, and the cost of such work shall be included in the applicable pay items of work. Final payment shall not be requested by the Contractor or made by the Town until as-built (record) drawings have been submitted to the Engineer.

A. Sheeting and shoring.

B. Grading.

C. Protection of existing utilities.

D. By-pass pumping and temporary piping, as necessary.

E. Replacement and/or repair of existing utilities damaged during construction.

F. Trench excavation, including necessary pavement removal, rock removal, and muck removal.

G. Temporary Drainage Systems

H. Ditch and swale restoration. (not anticipated)

I. Dewatering and disposal of surplus water.

J. Structural fill, backfill and grading.

K. Pipe bedding.

L. Adjusting existing valve boxes, manhole frames and covers and other structures.

M. Foundation and borrow materials.

N. Testing and placing system in operation.

O. Any material and equipment required to be installed and utilized for the tests.

P. Maintaining the existing quality of service during construction.

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Q. Appurtenant work as required for a complete and operable system.

R. As-built drawings and record documents. Prepared by Contractor's Surveyor.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

A. ROADWAY

3.1 BID ITEM NO. 0101-1 – MOBILIZATION

Payment for all work included under this bid item will be made at the lump sum price bid for mobilization and demobilization of all labor, equipment, materials and appurtenances necessary for construction of the project. Mobilization shall include all items within indices 600 through 670 of the FDOT Roadway and Traffic Design Standards, Latest Edition. Also included as part of this bid item is the cost for project performance indemnifications, photographs, video taping, shop drawings, working drawings, schedules, record drawings and documents, coordination, phasing and other miscellaneous items associated with the work. Measurement for this bid item will be lump sum. The lump sum price for mobilization/demobilization will be limited to five percent (5%) of the total contract amount unless the Contractor can prove to the Town that the actual Mobilization cost exceeds 5 percent (5%). Fifty percent (50%) of the lump sum price will be payable with the first month's partial payment. Twenty-five percent (25%) will be payable with the second month's partial payment. The final twenty-five percent (25%) will be payable with the final partial payment.

3.2 BID ITEM NO. 0102-1 – MAINTENANCE OF TRAFFIC

Payment for all work included under this bid item will be made at the lump sum price bid for all work associated with maintenance of traffic including barricades, signage, flagmen, temporary detours, temporary paving and all related items in accordance with the contract documents and meeting Town of Longboat Key requirements, including emergency services. Work shall also include preparation of specific maintenance of traffic plans, as required. Payment shall include all items and incidentals necessary to complete the work. Measurement for work included under this bid item will be lump sum. The lump sum price for maintenance of traffic will be limited to one percent (1%) of the total contract amount unless the Contractor can prove to the Town that the actual maintenance of traffic cost exceeds 1 percent (1%).

3.3 BID ITEM NO. 0110-1-1 – CLEARING AND GRUBBING

Payment for all work included under this bid item will be made at the lump sum price bid for all work associated with clearing and grubbing as necessary to construct proposed improvements. Payment shall include all items and incidentals necessary to complete the work including proper disposal. Measurement for work included under this bid item will be lump sum.

3.4 BID ITEM NO. 0285 7 04 – OPTIONAL BASE, BASE GROUP 04

Depth of base material varies throughout the project limits based on the profile. Base Group 04 is used based on the greatest depth of base material required. The cost for the pay item is based on the average depth of base material throughout this project.

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3.5 BID ITEM NO. 0570-1-2 – DRIVEWAY RESTORATION (PAVER/CONCRETE/SHELL/GRAVEL)

Shall include the cost of labor and materials to perform all work labor and to maintain access at each residential property. Where existing driveways are brick pavers, the brick pavers shall be removed, stored on site, and replaced at final grade to tie in with the drainage and roadway final grade as specified in the Contract Plans. Adjustments may be required and shall be approved by the Project Manager or designated representative and the homeowner. Where additional work outside of the Contract Plans is requested by the homeowner, separate agreement and payment will be arranged directly with the homeowner.

B. DRAINAGE

3.6 BID ITEM NO. 0430 524 100 – STRAIGHT CONCRETE ENDWALLS, 18”, SINGLE, 0 DEGREES ROUND

Shall include the cost of delegated engineering, geotechnical costs for the delegated design, labor, equipment, materials, supplies, transportation, earthwork, trench boxing, dewatering and supervision necessary to construct the outfall pipe, temporary seawall shoring, and endwall/seawall penetration as specified in the Contract Plans. Where additional work outside of the Contract Plans is requested by the homeowner, separate agreement and payment will be arranged directly with the homeowner.

3.7 PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 12” HDPE PIPE

Shall include the cost of labor, equipment, materials, supplies, transportation, earthwork, trench boxing, dewatering and supervision necessary to install 12” Round HDPE Pipe, as shown in the contract plans.

3.8 IN LINE CHECK VALVE – TIDE FLEX CHECKMATE

Shall include the cost of labor, equipment, materials, supplies, transportation, and supervision necessary to install in line check valves – Tide Flex Checkmate, as specified in the Contract Plans.

C. OTHER/MISCELLANEOUS

3.14 LANDSCAPE RESTORATION

Shall include the cost of labor and materials to perform all work necessary, including watering and fertilizing, to restore landscape or equivalent landscape documented in the Contract Plans. Where existing landscape features (hardscape or vegetative materials) are to be re-used, materials shall be stored on site and replaced at final grade to tie in with the drainage and roadway final grade as specified in the Contract Plans. Adjustments may be required and shall be approved by the Project Manager or designated representative and the homeowner. Where additional work outside of the Contract Plans is requested by the homeowner, separate agreement and payment will be arranged directly with the homeowner.

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3.15 UTILITY RELOCATIONS/ADJUSTMENTS

This item shall include Private Utility Adjustments or Relocations, Water Main Adjustments or Relocations, Potable Water Service Connection Adjustments, and Sanitary Service Connection Adjustments. Includes the cost of all labor and materials to adjust private utility, potable water main, potable water service lines, sanitary sewer service lines and relocation of them to maintain and re-establish private utility, potable water service, and/or sanitary sewer service. Provide a separate schedule of values to include quantities, unit prices, and total to equal bid for all Utility Relocations/Adjustments as a separate pay item upon receiving bid award, otherwise the quantity will be based on percent of construction completed.

END OF SECTION 01 13 00

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SECTION 01 70 00 – PROJECT CLOSEOUT

PART 1 – GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. Closeout is defined to include the general requirements near the end of the Contract Time, in preparation for final acceptance, final payment, normal termination of the Contract, occupancy by the Owner and similar actions evidencing completion of the work.

B. Specific requirements for individual units of work are specified in applicable sections of the contract specifications.

1.02 PREREQUISITES FOR SUBSTANTIAL COMPLETION

A. Prior to requesting Engineer's inspection for certification of substantial completion, as required by the General Conditions (for either the entire work or portions thereof), Contractor shall complete the following and list known exceptions in request to the Engineer:

1. Submit statement showing final accounting to the Contract Sum.

2. Submit special guarantees, warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

3. Obtain and submit occupancy permits, operating certificates, final inspection/test certificates, and similar releases enabling Owner's full and unrestricted use of the work and access to services and utilities.

4. Submit final record drawings (prepared by Contractor’s Surveyor), maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information as required for applicable agency certifications.

5. Deliver tools, spare parts, extra stocks of materials, and similar physical items to Owner.

6. Complete start-up testing of systems, and instruction of Owner's operating/ maintenance personnel.

7. Discontinue (or change over) and remove from the project site temporary facilities and services, along with construction tools and facilities, mock-ups, and similar elements.

8. Complete the final cleaning.

9. Touch-up and otherwise repair and restore marred exposed finishes.

10. Submit an executed Certificate of Substantial Completion.

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1.03 PREREQUISITES FOR FINAL ACCEPTANCE

A. Prior to requesting Engineer's final inspection for certification of final acceptance and final payment, as required by the General Conditions, Contractor shall complete the following and list known exceptions (if any) in request to the Engineer:

1. Submit final payment request with final releases and supports not previously submitted and accepted, as requested by the Contract Documents.

2. Submit updated final statement, accounting for additional changes to the Contract Sum.

3. Submit certified copy of Engineer's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated by the Engineer.

4. Submit final meter readings for utilities, measured record of stored fuel, and similar data as of the time of substantial completion or when Owner took possession of and responsibility for corresponding elements of the work.

5. Submit and execute the "Final Certification" form to the Engineer.

1.04 RECORD DOCUMENT SUBMITTALS

A. Specific requirements for record documents are indicated in individual sections of these specifications. The general requirements are indicated in General Conditions. Do not use record documents for construction purposes; protect from deterioration and loss in a secure fire-resistive location; provide access to record documents for the Engineer's inspection during normal working hours.

B. Record Drawings:

1. The Contractor shall maintain a white-print set (blue-line or black-line) of Contract Drawings and Shop Drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. The Contractor shall mark whichever drawings are most capable of showing the as-built condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at the corresponding location on the Contract Drawings. The Contractor shall mark with red erasable pencil and, where feasible, use other colors to distinguish between variations of separate categories of work. The Contractor shall mark-up new information which is recognized to be of importance to the Owner, but was for some reason not shown on either the Contract Drawings or Shop Drawings. The Contractor shall give particular attention to concealed work, which would be difficult to measure and record at a later date. The Contractor shall note related change order numbers where applicable. The Contractor shall revise the electronic files provided by the Engineer to create the record drawings from the as-built information and provide the required information, such as signed and sealed plans by a PSM, electronic files, mylars, testing reports, etc., to the Engineer for certifications to the applicable agencies.

2. The Contractor shall be held responsible for the accuracy of such data and shall bear any costs incurred in finding utilities as a result of incorrect data furnished by the Contractor.

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PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 CLOSEOUT PROCEDURE

A. General Operating/Maintenance Instructions:

1. The Contractor shall arrange for each installer of work requiring continuing maintenance or operation, to meet with the Owner's personnel, at the project site, for a time period required provide basic instruction needed for proper operation and maintenance of the entire work. The Contractor shall include instruction by manufacturer's representatives where installers are not expert in the required procedures. The Contractor shall review maintenance manuals, record documentation, tools, spare parts and materials, lubricants, fuels, identification system, control sequences, hazards, cleaning and similar procedures and facilities.

   For operational equipment, demonstrate start-up, shut-down emergency operations, noise and vibration adjustments, safety, economy/efficiency adjustments, and similar operations. The Contractor shall review maintenance and operations in relation to applicable guaranties, warranties, agreements to maintain, bonds, and similar continuing commitments.

3.02 FINAL CLEANING

A. The Contractor shall provide final cleaning of the work, at the time indicated, consisting of cleaning each surface or unit of work to the normal "clean" condition expected for a first-class cleaning and maintenance program. Comply with manufacturers' instructions for cleaning operations. The following are examples, but not by way of limitation, of the cleaning levels required:

1. Remove labels which are not required as permanent labels.

2. Clean exposed exterior and interior hard-surfaced finishes, including metals, masonry, stone, concrete, painted surfaces, plastics, tile, wood, special coating, and similar surfaces, to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Except as otherwise indicated; avoid the disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.

3. Wipe surfaces of mechanical and electrical equipment clean and remove excess lubrication and other substances.

4. Remove dirt and surface dust from limited-access spaces including roofs, plenums, Shafts, trenches, equipment vaults, manholes and similar spaces.

5. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.

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6. Clean project site, yard and grounds, including landscape and development areas, of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petrochemical spills and other foreign deposits. Rake grounds, which are neither planted nor paved, to a smooth, even-textured surface.

B. Time of Final Cleaning:

1. Following the Contractor's certification of "Substantial Completion", and immediately before the Engineer's "Final Acceptance" inspection.

C. Removal of Protection:

1. Except as otherwise indicated or requested by the Engineer, the Contractor shall remove temporary protection devices and facilities which were installed during the course of the work to protect previously completed work during the remainder of the construction period.

D. Compliances:

1. The Contractor shall comply with safety standards and governing regulations for cleaning operations. The Contractor shall not burn waste materials at the site, or bury debris or excess materials on the Owner's property, or discharge volatile or other harmful or dangerous materials into drainage systems; remove waste materials from the site and dispose of in a lawful manner.

2. Where extra materials of value remaining after completion of the associated work have become the Owner's property, the Contractor shall legally dispose or store at the site as directed by the Owner or Engineer.

END OF SECTION 01 70 00

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SECTION 31 10 00 - SITE CLEARING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of site clearing shall include clearing existing facilities, infrastructure, trees, vegetation, and brush necessary to construct the proposed improvements. All trees which will not interfere with construction shall be protected from damage. Cost to protect trees, shrubs and other facilities, etc. is incidental to the project cost.

B. Site clearing work includes, but is not limited to, the following:

1. Protection of existing trees.

2. Removal of trees and other vegetation.

3. Muck removal.

4. Asphalt and base removal.

5. Curb and Gutter removal.

6. Culvert Pipe removal.

7. Pipe removal.

8. Manhole removal.

9. Other types of obstructions (direct or indirect) with the construction of the project. This does not limit to only conflicts shown on the plans.

1.2 JOB CONDITIONS

The Contractor shall:

A. Protect Existing Improvements:

1. Provide protection necessary to prevent damage to existing improvements indicated to remain in place.

2. Protect improvements on adjoining properties and on the Owner's property.

3. Restore damaged improvements to their original condition, as acceptable to parties having jurisdiction.

B. Protect Existing Trees and Vegetation:

1. Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip lines, excess foot or vehicular traffic, or parking of vehicles within drip line.

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2. Provide temporary guards to protect trees and vegetation to be left standing.

3. Water trees and other vegetation to remain within the limits of the Contract work, as required, maintaining their health during the course of construction operations.

4. Provide protection for roots over two-inch (2”) diameter cut during construction operations. Coat the cut faces with emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 SITE CLEARING

A. General:

1. The Contractor shall remove vegetation, improvements, or obstructions interfering with installation of new construction.

2. The Contractor shall carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction.

B. Removal of Improvements:

1. The Contractor shall remove above-grade and below-grade improvements necessary to permit construction, and other work as indicated.

2. Disking will not be permitted.

3.2 DISPOSAL OF WASTE MATERIALS

A. Burning on Owner's Property:

1. Burning is not permitted on the Owner's property.

B. Removal from Owner's Property:

1. The Contractor shall remove waste materials and unsuitable fill material from the Owner's property and dispose of legally.

END OF SECTION 31 10 00

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SECTION 31 22 19 - FINISH GRADING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work

1. Finish grade sub-soil.
2. Cut out areas to receive Planting, Sod or Mulch.
3. Place and finish grade for Planting or Mulch area.

1.02 PROTECTION

A. Prevent damage to existing fencing, trees, landscaping, natural features, benchmarks, pavement, and utility lines. Correct damage at no cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Mulch: See Plans.

PART 3 - EXECUTION

3.01 SUB-SOIL PREPARATION

A. Rough grade sub-soil systematically to allow for a maximum amount of natural settlement and compaction. Eliminate uneven areas and low spots. Remove debris, roots branches, stones, etc. Remove sub-soil which has been contaminated with petroleum products.

B. Cut out areas to sub-grade elevation, which are to receive Planting, Sod or Mulch.

C. Bring sub-soil to required levels, profiles, and contours. Make changes in grade gradual. Blend slopes into level areas. Provide a finish grade in all areas to allow for drainage.

3.02 PLACING MULCH

A. Place Mulch in Planting surface areas. Place to the following minimum depths:

1. Three (3) inches for planting areas.

B. Two (2) inches for top dressing when required.

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C. Remove stone, roots, grass, weeds, debris, and other foreign material prior to spreading.

D. Lightly compact placed Mulch.

3.03 SURPLUS MATERIAL

A. Remove surplus sub-soil and topsoil from site.

B. Leave entire job site clean and raked, ready for operation.

END OF SECTION 31 22 19

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SECTION 31 23 00 - EXCAVATION AND FILL

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The work included under this Section consists of excavating, backfilling, and grading required for the following site rough grading as shown on the Drawings and as specified herein.

B. Definitions:

1. Maximum Density: Maximum weight in pounds per cubic foot of a specific material.
2. Optimum Moisture: Percentage of water in a specific material at maximum density.
3. Rock Excavation: Excavation of any hard natural substance which requires the use of explosives and/or special impact tools such as jackhammers, sledges, chisels, or similar devices specifically designed for use in cutting or breaking rock, but exclusive of trench excavating machinery.

C. The Contractor shall be responsible for having determined to his satisfaction, prior to the submission of his bid, the conformation of the ground, the character and quality of the substrata, the types and quantities of materials to be encountered, the nature of the groundwater conditions, the prosecution of the work, the general and local conditions and all other matters which can in any way affect the work under this Contract. The prices established in the Proposal for the work to be done will reflect all costs pertaining to the work. No claims for extras based on substrata or groundwater table conditions will be allowed.

1.2 QUALITY ASSURANCE

D. A Testing Laboratory retained by the Contractor will make such tests as are deemed advisable. The Contractor shall schedule his work to permit a reasonable time for testing before placing succeeding lifts and shall keep the laboratory informed of his progress.

1.3 RELATED WORK

E. Section 31 10 00, Site Clearing.

F. Section 31 22 19, Finish Grading.

PART 2 - PRODUCTS

2.1 MATERIALS

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A. Suitable materials for fill (designated on the drawings as fill or clean fill) shall be classified as A-1, A-3, or A-2-4 in accordance with AASHTO Designation M-145 and shall be free from vegetation and organic material. The Contractor shall use excavated material to meet fill requirements provided the material is suitable. The Contractor will be responsible for gradation requirements using the material. Thereafter the Contractor shall provide all necessary materials.

B. Select Material: Select material shall be suitable material that does not contain any rock larger than will pass a 2-inch-diameter ring.

C. Washed Rock: Washed rock, where required, shall be coarse aggregate for concrete with a minimum of fine material (FDOT Grade 3 or 4).

PART 3 - EXECUTION

3.1 PREPARATION

A. Clearing: Clearing, grubbing and disposal of debris shall be performed as specified in Section 31 10 00.

3.2 PERFORMANCE

B. Excavation:

1. The Contractor shall perform all excavation of every description and of whatever substances encountered, to the dimensions required for construction and as specified herein. All excavations shall be made by open cut.
2. Walls of the excavation shall be kept vertical and, if required to protect the safety of workers, the public, this or other work or structures, or excavation walls, the excavation shall be properly sheeted and braced. Excavation for the structures shall be sufficient to provide a clearance between their outer surfaces and the face of the excavation, sheeting, or bracing, of not less than 2 feet. Materials encountered in the excavation which tend to slough or flow into the excavation, undermine the banks, weaken the overlying strata, or are otherwise rendered unstable by the excavation operation shall be retained by sheeting, stabilization, grouting or other approved methods.

C. Stockpiled Materials: Materials removed from the excavation shall be stored and disposed of in a manner which will not interfere with traffic at the site. Material suitable for backfill shall be stockpiled until moved and used elsewhere. Material unsuitable for use in backfill shall be removed and disposed of by the Contractor at the Contractor's expense immediately after backfilling is placed.

D. Backfill: Backfill materials shall be placed in 8-inch layers and compacted to a minimum of 98 percent of maximum density as determined by AASHTO Method T-180. Backfilling shall be carried to the finished grades shown on the Drawings. Backfilling shall not commence until excavated areas to be covered have been inspected and approved.

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E. Foundation Preparation:

1. The existing ground beneath concrete footings shall be compacted to a density of not less than 98 percent of its maximum density as determined by AASHTO Method T-180 for a depth of not less than 2 feet below the bottom of the concrete footings. Any unsuitable foundation material shall be removed and replaced with suitable material.
2. Slabs on Grade: Subgrades for concrete slabs shall be cut, filled with suitable material, and compacted to the required grade. The top 12 inches of concrete slab subgrade in cut sections and all fill material shall be plate compacted to a density of not less than 98 percent of its maximum density as determined by AASHTO Method T-180. The subgrade material shall contain no rock that will not pass through a 6-inch-diameter ring, and, in the top 6 inches, which will not pass through a 3-inch-diameter ring.

END OF SECTION 31 23 00

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SECTION 31 30 00 - PREVENTION, CONTROL & ABATEMENT OF EROSION & WATER POLLUTION

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. Prevention, control and abatement of erosion and water pollution shall conform to the requirements of the Florida Department of Environmental Protection (FDEP) and other regulatory agencies having jurisdiction.

B. The Contractor shall present his schedules for construction of the project at the preconstruction conference, as required. This schedule shall include a complete outline for the proposed construction of any and/or all of the pollution control and erosion abatement items. The Contractor is responsible for the implementation of the schedule after approval by the Engineer.

C. The Contractor and/or Contractor's representative shall prepare a Stormwater Pollution Prevention Plan (SWPPP) in accordance with Chapter 62-621, F.A.C. and local agency requirements and complete the necessary permit forms, request the applicable fees for Notice of Intent and Notice of Termination from the Owner, and file the application with FDEP. The Contractor shall provide the Engineer a copy of the SWPPP at the preconstruction conference. The Contractor shall submit a copy of the executed NOI and the SWPPP to the Town of Longboat Key, as required. In addition, a copy of the SWPPP and NOI should be kept on-site and the Contractor shall comply with weekly inspection requirements as noted in the generic permit. The SWPPP shall conform to the guidelines contained within the FDEP requirements.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 31 30 00

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SECTION 32 04 00 - PERMITS

This project is considered “exempt” from SWFWMD permitting. Gulf of Mexico Drive is considered Florida Department of Transportation (FDOT) right-of-way; therefore if construction affects this roadway, FDOT permitting may be needed. The project should be exempt from Army Corp of Engineering (ACOE) and Florida Department of Environmental Protection (FDEP) permits, since there are no impacts to wetlands or waters of the state.

The following construction permits as applicable to this project, are required to be obtained by the Contractor:

1. Right of Way Use Permit (Town of Longboat Key)
2. Demolition Permit (Town of Longboat Key)
3. Tree Removal Permit (Town of Longboat Key)
4. Any other Permits that may be required.

END OF SECTION 32 04 00

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SECTION 32 07 00 - FIELD ENGINEERING

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The work of all crafts and trades shall be laid out to lines and elevations as established by the Contractor from the Drawings, or from instructions by the Engineer.

B. Unless otherwise shown, all work shall be plumb and level, in straight lines and true planes, parallel or square to the established lines and levels. The work shall be accurately measured and fitted to tolerances as established by the best practices of the crafts and trades involved, and shall be as required to fit all parts of the work carefully and neatly together.

1.2 SURVEY REFERENCE POINTS

A. The Contractor shall hire a Florida Professional Surveyor and Mapper (PSM) to identify the existing control points indicated on the Drawings as required.

B. Existing major horizontal and vertical control points for the Project are those designated on Drawings.

C. The Contractor shall:

1. Protect control points prior to starting work;

2. Preserve all permanent reference points during construction;

3. Make no changes or relocations unless directed by the Owner or his assigned representative;

4. Report to Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations;

5. Re-establish any control or reference points and/or property pins destroyed by the Contractor at his expense.

1.3 LINES AND GRADES

A. The Contractor's PSM shall layout the axis of all structures and set permanent hubs marking these lines. The Contractor's PSM shall also set a bench mark or marks near the site of all structures to furnish the Contractor with the elevation. The Contractor shall be responsible for all other lines and grades required for the construction for the project.

B. When waterlines, sewer force mains**,** and other such pressure pipelines are involved, the Contractor's PSM will stake the location of these lines on the site. Bench marks are required for reference; these shall be established by the Contractor's PSM.

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C. The Contractor shall furnish a Florida Professional Surveyor and Mapper all materials, stakes and grade boards that are required for all utility construction layout. In addition, the Contractor shall furnish any aides required by the Engineer in marking the location of the various facilities on the ground, establishing bench levels and determining as-built conditions after the work is completed. The Contractor's personnel engaged in the layout work described herein and the aides furnished to the Engineer shall be fully capable of performing the duties set out herein and shall be fully qualified chiefs and/or chainmen, as required.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 32 07 00

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SECTION 32 08 00 - MAINTENANCE OF TRAFFIC (MOT)

PART 1 – GENERAL

1.1 DESCRIPTION

A. The work of this Section consists of maintaining traffic within the project limits during the entire construction period, including any temporary suspensions of work, and includes all traffic control plans, facilities, devices, and operations as required for the safety and convenience of the public and to minimize public nuisance, as specified herein. The Contractor's work includes preparing approved traffic control plans, construction and maintenance of approved detour facilities, providing necessary facilities for access to residences and businesses along the project, furnishing, installing, and maintaining traffic control markings, signs, and safety devices, and any other special requirements for safe and expeditious movement of traffic in the project area and other impacted areas as specified herein.

1.2 STANDARD REQUIREMENTS FOR MAINTENANCE OF TRAFFIC

A. All MOT work shall conform to the latest of editions of the following: Part VI, The Federal Highway Administration's Manual on Uniform Traffic Control Devices; FDOT's Roadway Plans Preparation Manual, Chapter 10, Work Zone Traffic Control; FDOT's Transportation Roadway and Traffic Design Standards, Indexes 415, 600-670, and 700; and FDOT's Standard Specifications for Road and Bridge Construction, Section 102. Regardless of the MOT standards and specific traffic control plan used, it is the Contractor's responsibility to maintain the work zone in a safe condition.

1.3 SUBMITTALS

A. Traffic Control Plan - Preparing detailed work zone traffic control plans for the Engineer's approval is included in this Section. The plan will indicate a traffic control plan for each phase of the Contractor's activities. The Contractor may not begin work until a traffic control plan is approved in writing by the Engineer. Traffic control plans modifications require the Engineer's written approval. Except in an emergency, no changes to the approved plan are allowed until written approval is received.

1.4 SPECIFIC REQUIREMENTS

A. The work for MOT includes the following:

1. All roads will be kept open to two (2) way traffic during construction, except one (1) way roads and where otherwise approved in the MOT. Except in approved detoured areas, the Contractor will maintain one (1) lane of traffic in each direction (each lane 11-foot wide minimum) at all times by using existing or constructing temporary pavement.

2. Portions of work phases may be worked concurrently with the approval of the Engineer while maintaining traffic.

3. Temporary pavement will consist of six-inch (6") thick crushed concrete base and one-inch (1") thick asphalt concrete surface; cost is included in MOT.

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4. Construction of major side streets can be phased similarly to maintain one (1) lane of traffic in each direction (each lane 11-foot wide minimum) at all times by using existing or constructing temporary pavement.

5. Cost of all barricades, temporary pavement marking, and signing are included in the cost of MOT. The Contractor will erect and maintain all barricades, warning signs, and delineators.

6. Detouring of traffic to other roads to by-pass the project area must be Engineer-approved before implemented.

7. The Contractor shall remove any existing striping conflicting with MOT during construction and provide adequate signing and/or striping. Advanced "road closed" warning signs shall be placed at side street at the direction of the Engineer.

8. Paved temporary connections shall be provided at intersections as directed by the Engineer.

9. Alternate access will be provided to all residences and businesses whenever construction interferes with the existing means of access. The Contractor is not permitted to isolate residences or businesses.

10. Major intersections shall have through movements maintained at all times during construction except during short periods of time approved by the Engineer.

11. Traffic shall be maintained on paved, dust free surfaces at all times.

12. The resetting of traffic signs on side streets and the resurfacing and/or pavement marking on detour roads and/or side streets before and after construction is completed shall be included in the cost of Maintenance of Traffic.

13. The Engineer shall approve any alteration of approved traffic patterns prior to implementation.

14. The Contractor is responsible for establishing a work schedule so that any location under construction will not be left in hazardous condition at the completion of any work period.

15. When construction activities require flagmen for traffic control, the Contractor will employ the appropriate number of trained, competent flagmen, and will provide them with appropriate equipment in good condition.

16. Temporary approaches or crossings and intersections with trails, roads, streets, businesses, parking lots, residences, and garages will be provided and maintained in a safe condition by the Contractor. The Contractor shall take precautions to protect the work and the safety of the public.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 32 08 00

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SECTION 32 10 00 - CAST-IN-PLACE CONCRETE – CIVIL

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The extent of concrete work is shown on the drawings.

B. Concrete sidewalks, driveways, curbs, and gutters shall meet the following requirements:

1. All concrete for sidewalks and driveways shall have a minimum 28-day compressive strength of 3,000 psi and have fibermesh reinforcing. Welded wire mesh shall not be used unless specifically approved in writing by the Owner.

2. All concrete for curbs and gutters shall have a minimum 28-day compressive strength of 3,000 psi.

1.2 CODES AND STANDARDS

A. Reference to standard specifications herein shall be construed as to be in reference to the latest revision or edition.

1.3 STORAGE

A. Immediately upon receipt at the site, cement that is to be site mixed shall be stored in a dry, weather tight building, properly ventilated and with provisions for prevention of moisture absorption.

B. Reinforcing shall be protected from the weather.

PART 2 – PRODUCTS

2.1 CONCRETE MATERIALS

A. Cement: Cement shall conform to standard specifications for "Portland Cement", ASTM C150, Type I.

B. Aggregate: Concrete aggregate shall conform to the current specifications for "Concrete Aggregate", ASTM Designation C33.

C. Water: Water used in mixing concrete shall be fresh, clean, and free from injurious amounts of oil, acid, alkali or organic matter.

D. Ready-Mix Concrete: Ready-mixed concrete may be used at the option of the Contractor, provided that such concrete meets the requirements of these specifications and of ASTM Designation C94 for "Ready-Mixed Concrete".

E. High-Early-Strength Concrete: Concrete made with high-early-strength Portland cement shall be used only when specifically authorized by the Engineer.

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The seven (7) day compressive strength of concrete made with high-early-strength cement shall be at least equal to the minimum 28-day compressive strength specified. All provisions of these specifications shall be applicable to high-early-strength concrete except the cement shall conform to ASTM Designation C150, Type III.

2.2 RELATED MATERIALS

A. Reinforcing: Deformed Reinforcing Bars, ASTM A615; Grade 60, unless otherwise indicated.

B. Liquid Membrane-Forming Curing Compound: ASTM C309, Type I.

C. Form Materials:

1. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.

2. Exposed Concrete Surfaces: Suitable material to suit project conditions.

D. Waterstops: Used in joints shall be #10 gage steel sheet, four inches (4") wide, welded continuous through the joint, unless detailed otherwise.

E. Chemical Floor Hardener: Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, containing not less than two (2) lbs. of fluosilicates per gallon.

1. Apply to exposed concrete slabs not indicated or scheduled to receive subsequent finishes.

F. Fiber Mesh: All concrete sidewalks, slabs, aprons, driveways, etc. shall include fiber mesh.

2.3 QUALITY

A. Strength: The minimum 28-day compressive strength of reinforced concrete shall be 3,000 psi, unless shown otherwise on the Drawings.

1. Each cubic yard of 3,000 psi concrete shall contain no less than 480 lbs. of cement. The total water content per bag of cement shall not exceed 6.5 gallons.

B. Strength: The minimum 28-day compressive strength of non-reinforced concrete shall be 2,500 psi, unless shown otherwise on the Drawings.

1. Each cubic yard of 2,500 psi concrete shall contain no less than 440 lbs. of cement. The total water content per bag shall not exceed 7.5 gallons.

C. Mix Proportions: All concrete materials shall be proportioned so as to produce a workable mixture with a slump between two and four inches (2”-4”).

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D. Tests:

1. The Contractor shall provide, for test purposes, one (1) set of three (3) cylinders taken from each day's pour or each 100 yards placed, whichever is least or as directed by the Engineer. The Contractor, at his expense, shall supply test samples and an independent testing laboratory at the Contractors expense will make tests. The standard age of test shall be 28 days; but, when approved by the Engineer, seven (7) day tests may be used provided that the relation between the seven (7) and 28-day strengths of the concrete is established by test for materials and proportions used. If the test strength of the cylinders falls below the minimum allowable compressive strength, the Engineer shall have the right to order the Contractor to remove and renew that day's pour of concrete or the Contractor shall accept such deductions in the final payment as the Owner may deem reasonable.

2. Sampling and testing of concrete materials shall be made in accordance with ASTM Designations. The Contractor, at his expense, shall supply test samples, and an independent testing laboratory at the Contractor's expense shall make tests. The source from which concrete aggregates are to be obtained shall be selected by the Contractor well in advance of the time when they will be required in the work; and suitable samples, as they are to be used in the concrete, shall be furnished in advance of the time when the placing of the concrete is expected to begin.

PART 3 – EXECUTION

3.1 FORMING AND PLACING CONCRETE

A. Formwork: Construct so that concrete members and structures are of correct size, shape, alignment, elevation and position, complying with ACI 347.

B. Clean and adjust forms prior to concrete placement. Apply form release agents for wet forms, as required. Retighten forms during and after concrete placement, if required, to eliminate mortar leaks.

3.2 REINFORCEMENT

A. Position, support and secure reinforcement against displacement. Locate and support with metal chairs, runners, bolsters, spacers and hangers, as required. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

B. Install welded wire fabric in lengths as long as possible, lapping at least one (1) complete mesh.

C. Installation of Embedded Items: Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by cast-in-place concrete. Use setting diagrams, templates and instructions provided by others for locating and setting.

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3.3 CONCRETE PLACEMENT

A. Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.

B. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into all parts of the forms.

C. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement and curing. Concrete shall not be placed when the surrounding air temperature is below 40° F and dropping.

1. In cold weather comply with ACI 306.

2. In hot weather comply with ACI 305.

3.4 CONCRETE FINISHES

A. Nonslip Broom Finish: Apply nonslip broom finish to exterior concrete and sidewalks.

1. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with the Engineer before application.

3.5 BONDING AND GROUTING

A. Before depositing new concrete on or against concrete that has set, existing surfaces shall be thoroughly roughened and cleaned of glaze, foreign matter, and loose particles. An epoxy coating, as approved by the Engineer, shall be applied for bonding the new concrete to the old.

3.6 CURING

A. Concrete shall be kept continuously (not periodically) wet for a period of at least five (5) consecutive days by covering with water or with approved water saturated covering. Water for curing shall be clean and free from any elements, which might cause staining, or discoloration of the concrete surface.

B. Sidewalks and floor slabs may be cured by spraying with a Membrane-Forming curing compound, applied as per manufacturer's recommendations and as approved by the Engineer. This material shall not be used on any interior slabs to which an applied finish is to be bonded.

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3.7 PATCHING

A. Any concrete, which is not formed as shown on the drawings, or is out of alignment or level or shows a defective surface, shall be considered as not conforming with the intent of these specifications and shall be removed from the job by the Contractor at his expense, unless the Engineer grants permission to patch the defective area. This shall be done in accordance with the procedures above. Honeycomb consisting of ¾-inch diameter holes or greater shall be considered a defective surface. Permission to patch any such area shall not be considered a waiver of the Engineer's right to require complete removal of the defective work if the patching does not, in his opinion, satisfactorily restore the quality of the concrete and appearance of the surface.

B. As the forms are removed, fins, rough edges, and offsets shall be ground smooth. Holes to ¾", slight honeycomb, and minor defects shall be wet and filled with a 1:2 mix of cement mortar, matching color of surrounding concrete, and then troweled to a uniform plane. As soon as they have been troweled, the patched areas shall be sprayed with a curing compound, which will not destroy future bonding properties. Three (3) days after application of curing compound, the entire surface shall be finished by wetting and applying a 1:2 mix of cement mortar with a cement brick. Using the brick, mortar shall be rubbed into pits or indentations and excess mortar rubbed off to provide a uniformly textured surface. When the surface has dried, all loose sand and dust shall be removed and the surface then hosed down with water.

3.8 TOLERANCES

A. Tolerances for concrete work shall be in accordance with ACI 347.

END OF SECTION 32 10 00

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SECTION 32 12 15 - BASE COURSES AND PAVING

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. This section provides for street, drives and other asphalt concrete pavements.

1.2 SUBMITTALS

A. The Contractor shall submit the following in accordance with the provisions of Section 01 33 00:

1. List identifying the types and sources of materials proposed for this work.

2 Laboratory test reports for tests performed in the process of mix design.

3. Material certificates, signed by the material producer and the Contractor, certifying that each material item complies with, or exceeds, specified requirements.

1.3 REFERENCE STANDARDS

A. Latest editions of Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction (SSRBC) and FDOT Roadway and Traffic Design Standards shall apply to all work done within the FDOT right-of-way.

B. Latest requirements of the Town of Longboat Key and Manatee County shall apply to all work done within Town of Longboat Key right-of-way.

PART 2 – PRODUCTS

Materials provided under this section shall be as specified in the applicable sections of the Reference Standards stated herein and provided on the drawings.

PART 3 – EXECUTION

3.1 GENERAL

A. Pavement removed as a result of pipe installation shall be repaired after the pipe has been installed. Pipe trench, method of pavement cutting and soils compaction are specified in Section 33 08 00.

B. All valve boxes or other utility castings within the area to be surfaced shall be adjusted to the proposed surface elevation by the Contractor. The work shall be accomplished in such a manner as to leave the casting fixed permanently in its correct position.

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C. Execution of work under this section shall be in accordance with the applicable sections of the Reference Standards stated herein.

D. Crushed concrete base – Crushed concrete base material shall contain no impurities that will be detrimental to the pavement sections. Crushed concrete shall be tested by the contractor for Silicon dioxide, calcium carbonate, and aluminum hydroxide. Should these materials be found, then another source of crushed concrete shall be used. The material from the new source shall also be tested. The contractor shall be responsible to correct all pavement blisters up to three (3) years after placement.

END OF SECTION 32 12 15

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SECTION 32 15 00 - LAWN RESTORATION

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The work in this section consists of furnishing all labor, material and equipment to replace and maintain all areas disturbed during construction by establishing a stand of grass, within the areas called for by the furnishing and placing grass sod, or seeding, or seeding and mulching.

1.2 REFERENCE DOCUMENTS

A. The materials used in this work shall conform to the requirements of Florida Department of Transportation Standard Specifications for Road and Bridge Construction as follows:

1. Grassing and Sodding Materials - Section 981

2. Commercial Fertilizer - Section 982

3. Water for Grassing - Section 983

1.3 SUBMITTALS

A. Submit certifications and identification labels for all sodding supplied as specified in Section 01 33 00.

PART 2 – PRODUCTS

2.1 SOD

A. Types: When replacing sod in areas that are already sodded, the sod shall be the same type as the existing sod.

B. The sod shall be taken up in commercial-size rectangles, preferably 12 inch by 24 inch or larger, except where six inch (6”) strip sodding is called for.

C. The sod shall be sufficiently thick to secure a dense stand of live grass. The sod shall be live, fresh and uninjured at the time of planting. It shall have a soil mat of sufficient thickness adhering firmly to the roots to withstand all necessary handling. It shall be reasonably free of weeds and other grasses. It shall be planted as soon as possible after being dug and shall be shaded and kept moist from the time it is dug until it is planted.

D. Sod should be handled in a manner to prevent breaking or other damage. Sod shall not be handled by pitchforks or by dumping from trucks or other vehicles. Care shall be taken at all times to retain the native soil on the roots of each sod roll during stripping and handling.

Sod that has been damaged by handling during delivery, storage or installation will be rejected.

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2.2 FERTILIZER

A. Chemical fertilizer shall be supplied in suitable bags with the net weight certification of the shipment. Fertilizer shall be 12-8-8 and comply with Section 982 of the FDOT Standard Specifications for Road and Bridge Construction (latest edition).

B. The numerical designations for fertilizer indicate the minimum percentages (respectively) of (1) total nitrogen, (2) available phosphoric acid and (3) water soluble potash, contained in the fertilizer.

C. The chemical designation of the fertilizer shall be 12-8-8, with at least 50 percent (50%) of the nitrogen from a nonwater-soluble organic source. The nitrogen source may be an unreaformaldehyde source provided it is not derived from a waste product of the plastic industry.

2.3 EQUIPMENT

A. The device for spreading fertilizer shall be capable of uniformly distributing the material at the specified rate.

2.4 NETTING

A. Netting is fabricated of material similar to Geoscope Landscape Fabric or approved equal.

PART 3 – EXECUTION

3.1 SOD BED PREPARATION

A. Areas to be sodded and/or seeded shall be cleared of all rough grass, weeds, and debris, and brought to an even grade.

B. The soil shall then be thoroughly tilled to a minimum eight-inch (8”) depth.

C. The areas shall then be brought to proper grade, free of sticks, stones, or other foreign matter over one inch (1”) in diameter or dimension. The surface shall conform to finish grade, less the thickness of sod, free of water-retaining depressions, the soil friable and of uniformly firm texture.

3.2 INSPECTION

A. Verify that soil preparation and related preceding work has been completed.

B. Do not start work until conditions are satisfactory.

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3.3 SOD HANDLING AND INSTALLATION

A. During delivery, prior to planting, and during the planting of sod areas, the sod panels shall at all times be protected from excessive drying and unnecessary exposure of the roots to the sun. All sod shall be stacked during construction and planting so as not to be damaged by sweating or excessive heat and moisture.

B. After completion of soil conditioning as specified above, sod panels shall be laid tightly together so as to make a solid sodded lawn area. On mounds and other slopes, the long dimension of the sod shall be laid perpendicular to the slope. Immediately following sod laying the lawn areas shall be rolled with a lawn roller customarily used for such purposes, and then thoroughly watered.

C. Sod shall be placed at all areas where sod existed prior to construction, on slopes of three horizontal on one vertical (3:1) or greater, in areas where erosion of soils will occur, and as directed by the Engineer. On areas where the sod may slide, due to height and slope, the Engineer may direct that the sod be pegged, with pegs driven through the sod blocks into firm earth, at suitable intervals.

3.4 SOD MAINTENANCE

A. The sod shall produce a dense, well established growth. The Contractor shall be responsible for the repair and re-sodding of all eroded or bare spots until project acceptance. Repair to sodding shall be accomplished as in the original work.

B. Sufficient watering shall be done by the Contractor to maintain adequate moisture for optimum development of the seeded and sodded areas. Sodded areas shall receive no less than 1.5 inches (1.5”) of water per week for at least two (2) weeks. Thereafter, the Contractor shall apply water for a minimum of 60 days, as needed, until the sod takes root and starts to grow or until final acceptance, whichever is latest.

3.5 CLEANING

A. Remove debris and excess materials from the project site.

END OF SECTION 32 15 00

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SECTION 33 08 00 - TRENCHING, BACKFILLING AND COMPACTING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of trenching, backfilling and compacting as shown on the drawings.

B. This section includes furnishing equipment, labor and materials, and performing all operations necessary and incidental to perform the required work.

C. All work shall be in accordance with all local, state, and federal ordinances and regulations.

D. The Contractor shall be responsible for the integrity of the pavement restoration for a minimum period of two (2) years following final acceptance of the project. All costs associated with pavement restoration shall be borne by the Contractor.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 EXCAVATION

A. General: The Contractor shall perform excavation described of substance encountered to the dimensions and depths specified or shown on the drawings. Undercutting shall not be permitted, except when ordered by the Engineer in writing. Material suitable for backfill shall be stockpiled near the site for use on the project. Rock and other material undesirable for backfill and excess material shall be disposed of properly. Where it is necessary to cut roots projecting into an excavation or where it is necessary to trim branches for equipment clearance, all severed root ends or cuts to branches over two-inch (2") diameter shall be treated with an asphalt base pruning paint. Backfill with earth over exposed roots as soon as possible.

B. Rock: Where encountered in the trench bed, rock shall be excavated to a depth of three (3) pipe diameters below the bottom of the pipe bell, but in no case less than six-inches (6"). All undercut trench excavation shall be backfilled with earth and tamped with materials as specified in the following paragraphs under unstable subgrade. All cost for rock removal is incidental to the project and no separate payment will be made.

C. Unstable Subgrade:

1. In the event that unsuitable material is encountered at or below the excavation depth specified or shown on the drawings, the Engineer shall be notified in writing. Such material shall be removed and replaced with suitable material. Methods and materials used for replacement shall be one of the following as directed by the Engineer in writing.

a. Suitable earth or sand compacted in the trench as approved by the Engineer in writing. No additional payment will be made for special pipe bedding.

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b. Gravel or crushed limerock, compacted in the trench as approved by the Engineer in writing. No additional payment will be made for special pipe bedding.

c. Existing materials stabilized after removal and then replaced and compacted in the trench at no additional cost to the Owner.

2. The Engineer shall determine the methods and materials to be used, based upon the condition of the excavation, the pipe structure to be supported, and the availability and character of stabilizing materials.

D. Trenches:

1. The Contractor shall keep pipe laying operation as close to the excavation operation as possible during the prosecution of the work. The Engineer reserves the right to stop the excavation at any time when, in his opinion, the excavation is opened too far in advance of the pipe laying.

2. Pipe trenches shall be excavated to a depth that will insure a minimum of 36", or as shown on the plans, of cover for all types of pipe, except service laterals. Trenches shall be only of sufficient width to provide a free working space on each side of the pipe. To prevent excess pressure on the pipe, the maximum width of trench at the top of the pipe and at the bottom of the trench shall not be greater than two (2) feet more than the greatest exterior diameter of the pipe. If this maximum width is exceeded, it shall be the Contractor's responsibility to provide, at no additional cost to the Owner, such additional bedding or select backfill materials as the Engineer may require. The excavation below the spring line shall be made to conform as near as possible to the shape of the lower third of the pipe. To protect the pipelines from unusual stresses, all work shall be done in open trenches. Excavation shall be made for bells of all pipes and of sufficient depth to permit access to the joint for construction and inspections. In no case will the bells be used to support the body of the pipe.

3. In order to avoid existing utilities, at times it may be necessary for the pipe to be laid deeper than the minimum cover specified in the preceding paragraph. The Contractor will not be allowed extra compensation for additional excavation involved.

4. In case excavation has been made deeper than necessary, a layer of concrete, fine gravel or other material satisfactory to the Engineer shall be placed, at no extra cost, to secure a firm foundation for the lower third of each pipe, where possible, excavated material shall be placed so as not to interfere with public travel. Bridging shall be provided to afford necessary access to public or private premises. Bridging shall be considered as part of the excavation operation and shall be supplied at no additional cost to the Owner.

E. Structural: (For inlets, manholes, valve pits and similar structures)

1. Remove sufficient material to allow proper space for erecting and removing forms. The elevations of the bottoms of footings, if shown on the drawings, shall be considered as approximate only, and the Engineer may order, in writing, such changes in dimensions or elevations of footings as may be deemed necessary to secure a satisfactory foundation.

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Excavation for structures shall be sufficient to leave at least twelve inches (12") in the clear between their outer surfaces and the embankment or timber that may be used to protect them. Backfill of earth under structures shall be filled with thoroughly compacted sand, gravel, or concrete at the expense of the Contractor.

2. After excavation for a structure is completed, the Contractor shall notify the Engineer to that effect. No concrete or reinforcing steel shall be placed until the Engineer has approved the depth of the excavation and the character of the foundation material.

F. Sheeting and Shoring:

1. The Contractor shall provide all trench and structural bracing, sheeting or shoring as necessary to construct and protect the excavation, existing utilities, structures and private property of all types and as required for the safety of the employees. Sheeting shall be removed or cut off by the Contractor during backfilling operations as directed by the Engineer. Removal of shoring for structures shall be done in such a manner as not to disturb or mar finished masonry or concrete surfaces. Sheeting and shoring plans shall be provided as required by local, state, and federal regulations and ordinances. Sheeting and shoring plans shall be signed and sealed by the Contractor's Engineer who designed system. No separate payment will be made for sheeting and shoring.

3.2 DRAINAGE

A. Grading shall be controlled in the vicinity of excavations so that the surface of the ground will be properly sloped to prevent water from running into trenches or other excavated areas. Any water, which accumulates in the excavations, shall be removed promptly by well point or by other means satisfactory to the Engineer in such a manner as to not create a nuisance to adjacent property or public thoroughfare.

Trenches shall be kept dry while pipe is being laid. Bridging of dewatering pipe shall be provided where necessary. Pumps and engines for well point systems shall be operated with mufflers, and at a minimum noise level as described by the most current noise ordinance. The Contractor will not be allowed to discharge water into the Owner's storm drainage system without the written approval of the Engineer. Such approval will be subject to the condition that the storm sewer be returned to its original condition, and all environmental requirements are met. The Contractor will not be allowed to discharge water into private property without consent to the Contractor from the property owner(s) or owner(s) association.

B. The Contractor is responsible for following all environmental requirements. The Contractor shall be financially responsible for any nuisance created due to discharge of water from his drainage system.

3.3 DEWATERING

A. All installations shall be within a dry area, unless otherwise approved by the Engineer. Dewatering system shall be utilized in accordance with good standard practice and must be efficient enough to lower the ground water level in advance of the excavation and maintain it continuously to keep the trench bottom and sides firm and dry. Sewer systems shall not be used as a drainage system for ground water.

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B. The Contractor shall have on-site, or available for immediate use at all times, dewatering equipment adequate to handle the ground water present. When well points are used, sufficient header pipe and points shall be provided to maintain a dry and workable excavation. All well points shall be installed with a shell or sand filter around the head of the point. If ground water is present, well points shall be installed prior to any installation, at no additional cost to the Owner.

C. Water pumped or drained from the site shall be handled in accordance with local, state, and federal rules and regulations.

D. Upon removal of well points, holes shall be filled with clean suitable material and compacted. No additional compensation shall be given for this task.

3.4 BACKFILL

A. Trenches:

1. Trenches shall be backfilled immediately after the pipe is laid unless other protection for the pipeline is provided. Clean earth, sand, crushed limerock or other material approved by the Engineer shall be used for backfill. Backfill material shall be selected, deposited and compacted (simultaneously on both sides of the pipe) so as to eliminate the possibility of lateral displacement of the pipe. Backfill material shall be solidly tamped around the pipes in layers to a level at least one (1) foot above the top of the pipe. Each layer shall be compacted to a maximum thickness of six inches (6”).

2. In paved areas, the remainder of the backfill shall be deposited and then compacted by mechanical tampers. Mechanical tamping of lifts in unpaved areas shall be to a maximum thickness of twelve inches (12”). In areas to be paved or repaved, the entire depth of backfill shall be deposited in lifts and compacted by hand or mechanical tampers to a maximum thickness of six inches (6”). Compaction shall be carried out to achieve a density of at least 98% of the maximum density as determined by AASHTO, Method T-180. Density test shall be done every lift and shall include a test at the spring line of the pipeline. The Contractor may be required to use flowable fill to accomplish the task listed above. The right-of-way authority shall dictate the requirement at the time of right-of-way permit issuance.

3. In areas to be paved and/or unpaved areas, density tests for determination of the specified compaction shall be made by a testing laboratory and spaced a minimum of one in every 300 feet of trench cut per lift and shall include a test at the spring line of the pipe. It is the intent of this specification to secure a condition where no further settlement of trenches will occur. When backfilling and compaction is completed, the roadway base for pavement replacement may be placed immediately. It will be the responsibility of the Contractor to restore the surface to the original grade wherever settlement occurs.

B. Wet Trenches:

1. Backfill for the pipe bed in wet trenches shall be crushed, graded limerock, and compacted in the trench. After the pipe is laid, a graded limerock backfill shall be placed and worked in around the haunches to a point six inches (6”) above the pipe.

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The width of the limerock material around the pipe shall not be less than the outside diameter of the pipe plus six inches (6”) on each side of the pipe. Material shall be carefully distributed along the pipe so as to provide full and uniform support under and around the pipe. Six inches (6”) above the top of the pipe and up to the water level, material from the excavation with no rock or earth exceeding four inches (4”) in any one dimension shall then be lifted to the trench and released at the water level. Material shall be uniformly distributed for the full width of the trench. Backfill and compaction above the water level in the trench shall be as specified above. All cost for graded limerock placed in wet trenches shall be included in the cost of excavation and backfill for the various sizes of pipe.

C. Structural:

1. To include, but not limited, manholes, vaults, wetwells, etc. After completion of foundation footings and walls and other construction below the elevation of the final grades, and prior to backfilling, forms shall be removed and the excavation shall be cleared of all trash and debris. Material for backfilling shall consist of the excavation, borrow sand or other approved materials, and shall be free of trash, lumber or other debris. Backfill shall be placed in horizontal layers not in excess of nine inches (9”) in thickness, and have moisture content such that a density may be obtained to prevent excessive settlement or shrinkage. Each layer shall be compacted by hand or approved machine tampers with extreme care being exerted not to damage pipe or structures. Backfill shall be placed and compacted evenly against the exposed surface to prevent undue stress on any surface. Density tests shall be taken as follows; within three (3) feet of centerline of the structure, every lift not to exceed twelve inches (12") and shall achieve at least 98% of the maximum density as determined by AASHTO, Method T-180.

3.5 RESTORATION OF SURFACE IMPROVEMENTS

A. Roadways, including shoulders, alleys and driveways of shell, limerock, stabilized soil or gravel, grass plots, sod, shrubbery, ornamental trees, signs, fences, or other surface improvements on public or private property which have been damaged or removed in excavating, shall be restored to conditions equal to or better than conditions existing prior to beginning work. Restoration of shoulders shall consist of sodding or seeding and mulching or stabilizing with limerock as selected by the Engineer and as shown on the construction drawings. The cost of doing this work shall be included in the cost of the various applicable items.

B. Materials for unpaved roadways, road shoulders, alleys, or driveways, shall be compacted to a minimum of 95% of the maximum density as determined by AASHTO, Method T-180. The cost of this work and furnishing new materials shall be included in the cost of the applicable items of work, as no separate payment will be made, unless a separate bid item is provided. Density test shall be completed for every lift twelve inches (12") to finish grade. Also a test shall be done at the spring line of the pipe.

3.6 FINE GRADING

A. Finished areas around structures shall be graded smooth and hand raked and shall meet the elevations and contours shown on the drawings. Lumber, earth clods, rocks and other undesirable materials shall be removed from the site.

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3.7 DISPOSAL OF MATERIALS

A. Such portions of the excavated materials, as needed and as suitable, shall be used for backfilling and grading throughout the work to the elevations as shown on the drawings or as directed. Excavated material in excess of the quantity required for the project shall be disposed of by the Contractor in accordance with local, state, and federal laws at no additional cost to the Owner. The Contractor shall leave the earth over the trenches or other excavations in a neat and uniform condition acceptable to the Owner.

3.8 ROADWAY REPLACEMENT

A. Asphalt pavement shall be removed by saw cutting on a straight line with edges as vertical as possible. Concrete pavement or asphalt surfaced concrete shall be removed by cutting with a concrete saw in as straight a line and vertically as possible. Materials to replace State Highway paving shall conform to the specifications required by the Florida Department of Transportation. On-site asphalt pavement replacement shall conform to the requirements of the construction drawings and any other applicable standards of Manatee County, if within County right-of-way, for the replacement of pavement.

B. The Owner shall have tests made by a certified independent testing laboratory to verify compaction results. Tests will be made, spaced a minimum of one in every 300 feet of trench cut. A minimum of one test shall be taken per lift in situations less than 300' of pipe run. All density tests shall be taken at each six inch (6”) or twelve inch (12") lift to finish grade and will include a test at the spring line of the pipe. The location of the tests will be determined by the Engineer.

C. Where asphalt or built-up asphalt pavement is replaced by concrete, the concrete shall have a minimum of six inches (6”) in thickness and be reinforced with fibermesh. Concrete for paving shall be 3,000 psi design strength. Where the pavement replacement is of like material, it shall be replaced in thickness equal to or better than that existing at the time of removal. (The same shall apply for concrete driveway replacement.)

D. Unless the base is sealed or other temporary paving is applied over areas to be repaved, pavement shall be replaced not later than three (3) weeks after completion of backfill.

3.9 TESTS

A. The Contractor shall furnish facilities for making all density tests and make such restorations as may be necessary due to test operations. All density tests on backfill or base replacement shall be made by a certified commercial testing laboratory constructed by the Contractor and at such locations as may be recommended by the Engineer. If the densities as determined by the specified tests fall below the required minimums, the Contractor shall pay for all retests.

1. Density shall be at least 98% of the maximum density as determined by AASHTO, method T-180 for road crossing and shoulders.

2. Density shall be at least 95% of the maximum density as determined by AASHTO, method T-180, for all unpaved areas. Tests shall be taken every 300' of trench cut per lift.

3. Two (2) density tests shall be taken per road crossing.

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4. The Contractor shall submit two (2) copies of certified test results to the Engineer on a weekly basis.

5. Density test shall be taken within seven (7) days after the installation.

3.10 SIDEWALK, CURB AND GUTTER REMOVAL AND REPLACEMENT

A. Sidewalk, curb and gutter removal and replacement required in the construction of this work shall be done by the Contractor. Reasonable care shall be exercised in removing sidewalk and curb and gutter and the Contractor shall legally dispose of this material, as directed by the Engineer, on a weekly basis. Brick, concrete or built-up asphalt sidewalk replacement and curb and gutter replacement shall be replaced with like material in a manner and condition equal to or better than that existing at the time of removal. No separate payment will be made for this item unless specific pay items are provided in the bid schedule.

Materials and methods of replacing State Highway sidewalks or curbs shall conform to the Florida Department of Transportation specifications (latest edition).

END OF SECTION 33 08 00

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SECTION 33 09 00 - OPEN CUT TRENCH REPAIR

PART 1 – GENERAL

1.1 SCOPE

A. The work included under this specification shall include the furnishing of all labor, material, and equipment necessary to restore open cut trenches perpendicular to travel lanes to satisfactory condition meeting current standards of the Manatee County within the Town of Longboat Key right-of-way or meeting the detail for pavement replacement within the Drawings for on-site travel lanes.

1.2 REFERENCE SPECIFICATIONS

A. See Section 33 08 00 – Trenching, Backfilling and Compacting.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 GENERAL

A. The Contractor shall be responsible for providing a detailed Maintenance of Traffic (MOT) Plan, as required by the Owner or applicable agencies for any work completed within the road right-of-way. The Contractor shall be responsible for temporary restoration of all roadway cuts and for maintaining all cuts in a drivable condition prior to final restoration. All settled areas shall be immediately refilled by the Contractor and maintenance of crossings and construction within paved areas must meet County requirements. The Contractor shall be responsible for final restoration (within 28 days) of construction of the trench.

B. The Contractor shall give a written notice to the Engineer at least 72 hours prior to commencement of resurfacing. If resurfacing will not be accomplished as a single operation, then individual notices shall be given for each section to be resurfaced.

C. The Contractor shall be responsible for the integrity of the Pavement Restoration for a minimum period of one (1) year following the final acceptance of the project. All costs associated with pavement restoration shall be borne by the Contractor.

3.2 STATE ROAD CROSSINGS

A. State roadways, which are open cut in areas where resurfacing is required, shall be restored in accordance with details shown on the plans and Standard specifications for highway construction of the Florida Department of Transportation, latest edition.

3.3 SECONDARY ROAD CROSSINGS

A. Secondary road crossings, which are open cut in areas where resurfacing is required, shall be restored in accordance with the details shown on the plans and technical requirements of Manatee County.

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B. Secondary road crossings made in unpaved and/or un-surfaced areas are to be restored in accordance with the details shown on the plans. Sufficient amount of approved material must be distributed on the roadway to provide a condition equal to or greater than the condition of the road, which existed prior to the commencement of construction.

3.4 PRIVATE ROADWAYS

A. Private road crossings, which are open cut in areas where the roadway is surfaced with bituminous material, shall be restored in accordance with the details shown on the plans. Private road crossings, which are open cut in unpaved areas, shall be restored in accordance with the details shown on the plans. Sufficient amounts of approved material shall be distributed on the roadway in such a manner as to leave the roadway in condition substantially equal to that, which existed prior to the commencement of construction.

3.5 COMPACTION AND TESTING

A. State, County and private road crossings, which are open cut, shall be compacted and tested as described herein. Backfill below the road base material shall be compacted as shown on the plans.

B. Road base material shall be replaced and compacted in two (2) or three (3) layers, to attain a thickness of two (2) times the original base material thickness or a minimum of twelve inches (12”), and extend a minimum of six inches (6”) outside the existing roadway. Crushed concrete bases shall be compacted to the density shown the plans.

C. The Owner shall obtain a testing company to perform the required compaction density tests. The testing firm must have the approval of the Engineer prior to the commencement of construction. Each crossing must have two (2) tests performed on the compacted sub-grade, and two (2) tests performed on the compacted base, at a minimum separation of 1/3 the traversed roadway distance. If any tested work fails to meet the specified compaction requirements, the testing company shall determine the extent of the faulty work, and all faulty work shall be re-excavated and replaced in accordance with this section, and the tests shall be repeated until specified requirements are met. Test data shall be submitted to the Engineer and approved by the Engineer prior to resurfacing of asphaltic concrete roads.

D. The contractor shall submit two (2) certified copies of all compaction tests specified below.

3.6 APPROVALS

A. The work under this specification will not be considered complete or satisfactory until approved by the Engineer, as well as the applicable governmental agency.

END OF SECTION 33 09 00

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SECTION 33 10 00 - PIPING – GENERAL

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The work covered by this section and the related sections consists of providing all labor, equipment, material and supplies and performing all operations required to install the various piping, valves, and accessories, for waterlines, force mains, and gravity sewer lines, as specified and shown on the Drawings.

B. Reference to standard specifications shall be construed to mean the latest edition or revision of the Manatee County Public Works and Utility standards for all utility improvements.

1.2 RELATED WORK DESCRIBED IN OTHER SECTIONS

A. Section 33 08 00 –Trenching, Backfilling and Compacting

B. Section 33 35 00 – Fittings

C. Section 33 50 00 – Polyvinyl Chloride (PVC) Pipe

D. Section 33 70 00 – Valves and Accessories

1.3 SUBMITTALS

A. Submittals for the various types of pipe and fittings are specified in the individual sections.

B. Shop drawings or catalog cuts shall be submitted for all valves, boxes and restrained joints.

C. Record drawings shall be submitted in accordance with the requirements of Section 01 33 00, Submittals and Section 01 70 00, Project Closeout. The type of pipe used shall also be noted on the Drawings.

D. Pipe elevations shall be submitted as specified under "Installation" in this Section.

E. The manufacturer shall furnish a sworn affidavit that the pipe, fittings and lining furnished under the Contract or Agreement comply with all applicable provisions of the ANSI and/or AWWA Standards.

F. The Contractor shall submit reports on pressure and leakage tests.

G. Reports on bacteriological tests shall be submitted by the Contractor.

1.4 JOB CONDITIONS

A. Interruptions to utility service shall be minimized. The Contractor shall submit plans and schedules to the Engineer for approval by the proper authority before any shutdown or any interruption in service takes place.

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PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 INSPECTION

A. All pipes shall be subject to inspection at the factory by the Engineer or Owner. The Contractor shall provide a production schedule in sufficient time so plans can be made for in-plant inspection of the pipe or fittings during production, should it be required.

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

3.2 TESTS

A. All tests shall be made in the presence of the Owner or Engineer unless waived in writing. The Contractor shall notify the Engineer in sufficient time (48-hour minimum) when tests are being conducted to allow for travel time to the manufacturer's plant.

3.3 INSTALLATION OF ABOVE GROUND PIPING

A. Piping shall be installed as shown on the Drawings. Flanged joints shall be made up tight, care being taken to prevent undue strain upon pump nozzles, valves, and other pieces of equipment. Piping within structures shall be adequately supported from floors, walls, or ceilings. Supports from the floor shall be by approved saddle stands or suitable concrete piers as shown or approved by the Engineer. Pipe saddles shall be shaped to fit the pipe with which they will be used and shall be capable of screw adjustment. Concrete piers shall conform accurately to the bottom 1/3 to 1/4 of the pipe. Piping along walls shall be supported by approved wall brackets with attached pipe rolls or saddles or by wall brackets with adjustable hanger rods. For piping supported from above, approved rod hangers of a type capable of screw adjustment after erection of the piping and with suitable adjustable concrete inserts or beam clamps shall be used. Supports shall be located where shown, or specified, and in no case shall they exceed eight (8) feet on centers.

B. Unions and Flanges:

1. Unions and flanges are not, in every case, shown on the Drawings but are to be provided where necessary and adjacent to all equipment installed or provided for under this Contract. Ground joint unions shall be provided on pipe sizes up to and including two inches (2”). Flanged unions shall be used on all pipes larger than two inches (2”). Use malleable iron on steel piping, black or galvanized as specified for piping. Unions in copper piping shall be brass.

C. Wall Sleeves:

1. Pipe through concrete or masonry walls shall be placed in wall sleeves, except where wall pipe is shown on the Drawings. Wall sleeves shall be standard weight, Class D, of the sizes shown on the Drawings. Sleeves through walls and floors on grade shall be of sufficient length to extend through to finished surface.

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All sleeves shall be of adequate size to permit clearance for pipe movement and proper grading of pipe.

3.4 INSTALLATION OF UNDERGROUND PIPING

A. Excavation, trenching and backfilling for the installation of underground piping system shall be as specified in Section 33 08 00, Trenching, Backfilling and Compacting. Pipe shall be laid in a level trench. Irregularities shall be smoothed out or filled in with sand and tamped. Holes shall be scooped out where the bells occur leaving the entire barrel of the pipe bearing on the pipe bed. Locate tape shall be installed eighteen inches (18”) below finished grade. It shall state, "Caution, buried potable main below" for water, "Caution, buried force main below" for force main, "Caution, buried gravity main below" for sewer, and “Caution, buried vacuum main below” for vacuum sewers.

B. Laying of the pipe shall be commenced immediately after the excavation is started, and every means must be used to keep pipe laying closely behind the trenching. The Engineer may stop trenching when, in his opinion, the trench is open too far in advance of the pipe laying operation. Pipe may be laid in the best manner adapted to securing speed and good results. It shall, however, be in accordance with the manufacturer's instructions and recommendations. Damaged or unsound pipe or fittings will be removed and replaced by the Contractor at no additional cost to the Owner. Before jointing of the pipe, all lumps, blisters, excess coating material or oil shall be removed from the bell and spigot ends of the pipe. Pipelines shall be thrust-blocked or restrained to prevent movement of lines under pressure. The Contractor shall furnish restraints or concrete thrust-blocking. Concrete shall be a minimum 2,500 psi. For ductile iron pipe, thrust or anchor blocks or restrained joints shall be installed at all bends, tees, crosses, wyes, plugs, and reducers, as shown in details of typical thrust and anchor block placements on the Drawings. The number of feet of pipe with restrained joints necessary for each size pipe shall be as shown on the Drawings.

C. Where there is no adequate natural foundation upon which to construct a pipe bed, the pipe shall be constructed on a prepared stabilized subgrade or rock bedding of Class I materials as defined in ASTM D2321. Unsuitable subgrade materials shall be replaced or stabilized as described in Section C0 22 22. Where dewatering is required, Class I materials shall be used as described in ASTM D2321.

D. Pipe and fittings shall be strung out for one (1) day’s construction along the route of construction with the spigots pointing in the direction of the flow. Pipe shall be placed where it will cause least interference with traffic. Pipe shall be handled by mechanical equipment. Before the pipe is lowered into the trench, it shall be swabbed or brushed out to insure that no dirt or foreign material gets into the finished line. Trench waters 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 pipe.

E. Deflections from a straight line or grade made necessary by vertical curves or horizontal curves or offsets shall not exceed the manufacturer's recommendations. If the specified or required alignment requires deflection in excess of those recommended, the Contractor shall either provide special bends, as approved by the Engineer, or a sufficient number of shorter lengths of pipe to provide angular deflections within the required limit.

F. All joints shall be watertight and any leaks or defects discovered shall be immediately repaired to the satisfaction of the Engineer. Any pipe which has been disturbed after being laid shall be taken up, the joints cleaned and the pipes properly relaid.

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Any superfluous material inside the pipe shall be flushed or removed by means of an approved follower or scraper after joints are made. Installation of fittings and pipe joints shall be in strict accordance with the manufacturer's recommendations.

G. Where pipelines are stubbed out, in addition to thrust blocks, the stubouts shall be restrained to the main line fittings.

H. For the protection of exposed reinforcing in anchor blocks, and any all-thread restraint methods, the Contractor shall furnish and apply two coats of Koppers Bitumastic No. 505 protective coating.

I. Before backfilling, the Contractor shall obtain elevations on the top of the pipe barrel at 100-foot intervals along the pipeline and fittings and at any change in grade. These elevations shall be submitted to the Engineer.

J. Plastic pipe shall be installed in strict accordance with the provisions of ASTM D2321-74, including those provisions in respect to compaction of bedding and haunching material. Class IV or Class V materials as defined in ASTM D2321 shall not be used for bedding, haunching or initial backfill.

3.5 CONNECTIONS TO EXISTING MAINS

A. Where connections are required between new work and existing utility mains, the connection shall be made in a thorough and first class manner, using proper fittings to suit the actual conditions. Use ductile iron mechanical joint sleeve for connection to existing utility mains. In case a connection is made to an existing fitting in the line, the Contractor shall schedule his work so that digging and locating the existing fittings can be completed prior to starting trench work on the line. Cut-ins into lines shall be done at a time approved by the Engineer and proper authority.

The Contractor shall not make any connections or service taps into existing utility mains until their work has been tested and accepted by the Engineer.

3.6 TESTING PIPING SYSTEM

Testing shall meet the requirements of Manatee County Public Works and Utility Standards (latest edition).

3.7 FLUSHING

A. After the mains have been laid and pressure tested, each run of pipe shall be thoroughly flushed so as to remove all debris and foreign matter from the lines.

Flushing will ordinarily be done by opening fire hydrants or blowoffs along the pipeline. Where fire hydrants or blowoffs are not available or are of insufficient capacity to permit adequate flushing, the pipe line shall be opened and flumes or piping shall be provided by the Contractor to waste the water to the nearest approved disposal point. Sufficient flushing water shall be introduced into the mains to produce a velocity of not less than 2-1/2 feet per second, and this rate of flow shall be continued until the discharge is clear and no evidence of silt or foreign matter is visible.

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3.8 DISINFECTION AND TESTS

A. Disinfection of all equipment, pipelines, tanks, and other parts of the project with which water comes in contact and which have been contaminated by the Contractor's operations shall be accomplished after completion of construction and immediately before the system or unit is placed in operation. The Contractor shall procure and pay for all water required for disinfection and tests, and shall supply all test taps and equipment necessary to complete all testing per local Florida Department of Health and Engineer. Local Florida Department of Health and Engineer will determine all test points prior to testing.

B. The disinfecting agent shall be liquid chlorine or sodium hypochlorite solution conforming to Federal Specification O-S-602b Sodium Hypochlorite, Grade D.

C. The piping shall be disinfected by introducing the disinfecting agent into the water, which is being pumped into the system, in such manner that the entire system will be filled with water containing a minimum chlorine conc. of 50 ppm at any point. This water shall be allowed to remain in the system for a minimum contact period of 24 hours before the system is flushed out. The Contractor shall supply the Engineer with the type and quantity of chlorine to be used for disinfection.

D. After the disinfecting agents have been permitted to remain for the specified contact periods, the structures, pipelines, pumps and valves shall be thoroughly flushed with water until the residual chlorine tests are less than 0.2 ppm for each test. The determination of the amount of residual chlorine in the system shall be made at such points and by means of an orthotolodine test set in accord with standard procedures.

E. After any units or portions of the system have been disinfected and flushed as specified, samples of water shall be taken from several points as applicable in suitable sterilized containers by the local Florida Department of Health for bacterial examination. If repeated tests of such samples show the presence of coliform organisms, the disinfection shall be repeated or continued until tests indicate the absence of pollution. Two consecutive daily samples shall be satisfactorily tested before the system is placed in service.

F. The complete disinfection program and methods followed, especially if materially different from those specified, shall be in accordance with directives of the Florida Department of Environmental Protection and Department of Health. All methods employed shall have their approval. Definitive instructions as to the collection and shipment of the samples shall be requested from the Florida Department of Health and followed in all respects. Final written approval of the bacterial samples shall be received by the Engineer from the Florida Department of Health prior to the time that the system is placed into operation.

END OF SECTION 33 10 00

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SECTION 33 11 00 - FLOWABLE FILL

PART 1 – GENERAL

1.1 DESCRIPTION

A. The work specifies the requirements for flowable fill used for trenches, support for pipe structures, culverts, utility cuts, and other works where cavities exist and where firm support is needed for pavements and structural elements. Flowable fill may also be used to fill abandoned water and sewer lines, abandoned fuel tanks, and where compacted fill is needed, as approved by the Engineer and/or as shown in the Construction Plans.

PART 2 – PRODUCTS

2.1 MATERIALS

A. The materials used shall conform to the latest edition of the requirements specified in Division III and herein. Specific FDOT-SSRBC Section references are as follows:

1. Portland Cement Concrete – Section 346

2. Fine Aggregate (Sand) * - Section 902

3. Portland Cement and Blended Cement – Section 921

4. Water for Concrete – Section 923

* Any clean sand with 100% passing 3/8" sieve and not more than 10% passing the 200 mesh may be used.

PART 3 – EXECUTION

3.1 MIX PROPORTIONS

A. The Contractor shall be responsible for producing a flowable mixture using these guidelines and adjusting his mixture design as called for by circumstances or as may be directed by the Engineer.

B. Flowable fill material shall be proportioned to produce a 28-day compressive strength of approximately 150-200 psi.

C. General mix quantities are as follows:

Components	*Pounds per Cubic Yard*
Cement	50-100 *
Fly ash or granulated blast furnace slag	0-600
Fine sand	2750 (adjust to yield one CY of flowable fill)
Water	500 maximum

* The percentage of cement may be increased above these limits only when early strength is required and future removal is very unlikely.

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D. Weights for fine aggregate and water shall be adjusted according to cementitious content. The mix proportions shall be adjusted for removability, pumpability, and flowability. If required, strength test data shall be provided prior to batching.

E. If required by the Engineer, the flowability can be measured by afflux time determined in accordance with ASTM C939, and shall be 30 seconds, ±5 seconds, as measured on mortar passing the No. 4 sieve. The equipment required to perform this test shall be provided by the Contractor.

3.2 PRODUCTION AND PLACING

A. Flowable fill shall be produced and delivered using concrete construction equipment. Flowable fill shall be placed by chute, pumping, or other methods approved by the Engineer.

3.3 CONSTRUCTION REQUIREMENTS

A. The flowable fill shall be placed to the designated fill line without vibration or other means of compaction. Placement shall be avoided during inclement weather, e.g., rain or ambient temperatures below 40°F. The Contractor shall take all necessary precautions to prevent any damages caused by the hydraulic pressure of the fill during placement prior to hardening. Also, necessary means to confine the material within the designated space shall be provided by the Contractor.

3.4 ACCEPTANCE

A. The flowable fill shall be proportioned and placed as specified herein. In general, the strength desired is the maximum hardness that can be excavated at a later date using conventional excavating equipment. No curing protection is required.

B. The fill shall be left undisturbed until material obtains sufficient strength. Sufficient strength is 250 psi penetration resistance as measured using a handheld penetrometer. The penetrometer shall be provided by the Contractor.

C. All flowable fill areas subjected to traffic loads must have a durable riding surface.

3.5 BASIS OF PAYMENT

A. No additional compensation will be made for the use of flowable fill. Any additional cost will be considered incidental to the cost of material being replaced.

END OF SECTION 33 11 00

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SECTION 33 12 00 - GROUNDWATER CONTROL FOR OPEN CUT EXCAVATION

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. This section provides for furnishing all labor, materials, equipment, power and incidentals for performing all operations necessary to dewater, depressurize, drain and maintain excavations as described herein and as necessary for installation of pipeline and appurtenances. Included are installing, maintaining, operating and removing dewatering systems and other approved devices for the control of surface and groundwater during the construction of open cut excavations, directional drilling, pipelines and appurtenances, and protecting work against rising waters and repair of any resulting damage.

1.2 CONTRACTOR'S RESPONSIBILITY

A. It is the sole responsibility of the Contractor to identify groundwater conditions and to provide any and all labor, material, equipment, techniques and methods to lower, control and handle the groundwater, as necessary, for his construction methods and to monitor the effectiveness of this installed system and its effect on adjacent facilities.

B. The Contractor shall operate, maintain and modify the system(s), as required, to conform to these Specifications. Upon completion of the construction the Contractor shall remove the system(s).

C. The Contractor shall assume sole responsibility for dewatering systems and for all loss or damage resulting from partial or complete failure of protective measures and any settlement or resultant damage caused by the dewatering operation.

1.3 PLANS AND OTHER DATA TO BE SUBMITTED

A. Prior to commencement of work, submit complete drawings, details and layouts showing the proposed dewatering plans in accordance with Section 01 33 00. The submittals shall be sufficiently detailed (i.e., general arrangements, procedures to be used, etc.) to allow the Engineer to evaluate the proposed dewatering systems. Include the following, as required by the Contractor's proposed operation:

1. Names of equipment suppliers.

2. Names of installation subcontractors.

3. Plan for dewatering and control of surface drainage.

4. Plan for dewatering for cut-and-cover excavations or otherwise controlling groundwater.

5. Eductor system layout and details.

6. Deep well locations and details.

7. Well point system layout and details.

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8. Installation reports for eductors, deep wells and well points.

9. Water level readings from piezometers or observation wells, and method of maintenance.

10. The Contractor shall be responsible for the adequacy of the proposed dewatering system.

PART 2 – PRODUCTS

2.1 Provide necessary equipment including, but not limited to, pumps, eductors, well points, piping and other required materials.

PART 3 – EXECUTION

3.1 DEWATERING EXCAVATIONS

A. Furnish, install, operate and maintain all necessary equipment for dewatering the various parts of the Work and for maintaining free of water the excavations and such other parts of the Work as required for Construction operations. Dewatering system should provide for continuous operation including nights, weekends, holidays, etc. Appropriate backup shall be provided if electrical power is primary energy source for dewatering system.

B. Continue dewatering in all required areas, until the involved work is completed, including the placing and compaction of backfill materials in the dry.

C. Provide a uniform diameter for each pipe drain run constructed for dewatering. Remove the pipe drain when it has served its purpose. If removal of the pipe is impractical, provide grout connections at 50-foot intervals, and fill the pipe with clay grout or cement and sand grout when the pipe has served its purpose.

3.2 DEWATERING TRENCH

A. No pipeline shall be laid in a trench in the presence of water. All water shall be removed from the trench sufficiently ahead of the pipeline placing operation. The Engineer shall have full and final authority to require dewatering of the trench to ensure a dry, firm bed on which to place the pipeline. As a minimum, water levels shall be maintained at least six inches (6") below the bottom of the trench. Trench shall continue to be dewatered until trench backfilling operations have been completed.

B. Removal of water may be accomplished by pumping or pumping in connection with well point installation as the particular situation may warrant.

C. If the soils encountered at the trench grade are suitable for the passage of water, without destroying the sides or utility foundation of the trench, sumps may be provided at intervals at the side of the main trench excavation. Pumps shall be used to lower the water level by taking their suction from said sumps.

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3.3 REQUIREMENTS FOR EDUCTOR, WELL POINTS OR DEEP WELLS

A. Eductor, well points or deep wells, where used, must be furnished, installed and operated by a reputable contractor regularly engaged in this business and approved.

B. Submit the design criteria of the dewatering system and a certification that the system was designed according to that criterion.

C. Install sufficient piezometers or observation wells to show that all trench excavation in sandy material is predrained prior to excavation. Install piezometers or observation wells not less than one (1) week in advance of beginning of nearest excavation.

D. Dewatering may be omitted for portions of underdrains or other trenches, only where auger borings and piezometers or observation wells show that the soil is predrained by an exterior system.

3.4 MAINTENANCE AND OBSERVATION

A. Maintenance and observation of piezometers or observation wells is the responsibility of the Contractor and shall consist of keeping them in good condition and observing and recording the elevation of the water level daily, as long as the dewatering system is in operation, and weekly thereafter until the work is completed or the piezometers or wells are removed.

B. Submit a record of the water level to the Engineer each day.

C. Replace damaged and destroyed piezometers or observation wells, unless otherwise accepted by the Engineer, with new piezometers or wells within 48 hours, at no additional cost to the Owner.

D. Cut off piezometers or observation wells in excavation areas, where exposed, as excavation proceeds, and continue to maintain and make observations as specified.

E. Remove, backfill or grout piezometers or observation wells inside or outside the excavation area, as approved by the Engineer.

3.5 DURATION OF DRAINAGE

A. In areas where concrete is to be placed, carry out the foundation drainage so that the required lowering of the water table will be effected prior to placing reinforcing steel. Keep foundation beds free from water to the same levels for three (3) days after placing concrete.

3.6 PROTECTION OF STRUCTURES

A. Provide adequate protection for all structures to avoid damage to concrete.

B. Operate construction equipment over completed concrete slabs or structures only with approval. Rubber tire equipment heavier than five (5) tons and crawlers heavier than seven (7) tons will require adequate load spreading by sand fill or other means.

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3.7 DISCHARGE OF WATER

A. Do not discharge pumped drainage water into the sanitary sewer system or inhibit pedestrian or vehicular traffic with the groundwater control system.

B. Discharge pumped drainage water into the storm sewer system or drainage ditch by direct means (i.e., discharge hose to inlet, burying header, etc.). Contractor shall monitor the discharged water to determine that soil particles are not being removed.

C. All discharge shall be in conformance with regulatory permits and if discharged into receiving waters, shall not exceed 29 N.T.U.'s above background.

3.8 REPAIR OF DAMAGE

A. The Contractor shall assume full responsibility for all loss and damage due to flooding, rising water or seepage resulting from dewatering operations in any part of the work. Repair any damage to partially completed work from these or other causes, including the removal of slides, repair of foundation beds and performance of any other work necessitated by lack of adequate dewatering or drainage facilities.

END OF SECTION 33 12 00

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SECTION 33 15 00 - WATER SERVICES

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The Contractor shall furnish all material required for connection of water services.

B. Reference to standard specifications shall be construed to mean the latest edition or revision of the Manatee County Public Works and Utility Standards for all utility improvements.

1.2 RELATED WORK DESCRIBED IN OTHER SECTIONS

A. Section 33 08 00 –Trenching, Backfilling and Compacting

B. Section 33 50 00 – Polyvinyl Chloride (PVC) Pipe

PART 2 – PRODUCTS

2.1 SERVICE SADDLES

A. Service Saddles shall have CC thread and shall have a bronze body with double bronze straps and nuts with pressure rating not less than that of the pipe to which it is to be connected. Saddles have a rubber gasket cemented to the body, with compatible threading between the saddle and corporation stop, Saddles shall conform to ANSI/AWWA C800 standards. The service saddle shall provide full support around the circumference of the pipe, providing a bearing area of sufficient width to ensure that the pipe will not distort when the saddle is tightened.

B. Service saddles shall be Mueller Series H-13000 up to eight inch (8”) and Mueller Series BR2B for ten inch (10”) and twelve inch (12”), or approved equal. Single strap saddles are not acceptable. NOTE: Saddles shall have CC Thread, unless otherwise shown on the Drawings.

2.2 COUPLINGS

A. All couplings shall be compatible with the type of service piping used. Couplings shall be as manufactured by Mueller Company, or approved equal. Couplings shall not be installed under existing or proposed pavement.

2.3 CORPORATION STOPS

A. Corporation Stops in sizes one through two inch (1”-2”) shall have CC thread, be manufactured from cast bronze with machined fitting surfaces, and conform to the requirements of ANSI/AWWA C800. The outlet shall be compression joint. The corporation shall be pressure rated at 150 psi. Corporation stops shall be Mueller 110 compression connection (ball type) or approved equal.

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2.4 METER (CURB) STOPS

A. A curb stop shall be installed at the end of every private service pipe at the property line. Meter (curb) stops shall be water works, angle, ball type, with full port, tee handle, meter nut and lock wing without drain. Pipe connections shall be suitable for the type of service pipe used. All parts shall be of bronze or brass with female iron pipe size connections or compression-pattern and shall be designed for a hydrostatic test pressure not less than 150 psi. Curb stops shall conform to ANSI/AWWA C800 standards. (Mueller 300 ball valve or approved equal.)

2.5 METER BOXES

A. Meter boxes shall be in accordance with Manatee County Public Works and Utility Standards, latest revision.

PART 3 – EXECUTION

3.1 INSTALLATION

A. All appurtenances necessary for the connection of the water services shall be installed in accordance with the manufacturer's recommendations and the latest edition or revision of Manatee County Public Works and Utility Standards for water system improvements.

3.2 METERS

A. The meter and meter couplings shall be furnished and installed by Town of Longboat Key unless directed, shown or specified otherwise. Meter boxes shall be properly sized for the meter intended.

END OF SECTION 33 15 00

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SECTION 33 16 00 - SEWER SERVICES

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The Contractor shall furnish all material, labor, equipment and other necessary supplies needed to install sewer services at locations and depths shown on drawings or as directed by the Engineer.

B. Reference to standard specifications shall be construed to mean the latest edition or revision of the Manatee County Public Works and Utility Standards.

1.2 RELATED WORK DESCRIBED IN OTHER SECTIONS

A. Section 33 08 00 –Trenching, Backfilling and Compacting

B. Section 33 50 00 – Polyvinyl Chloride (PVC) Pipe

PART 2 – PRODUCTS

2.1 PIPE

A. All sewer services, unless otherwise specified or directed, shall be four inch (4”) or six inch (6”) diameter pipe of the same material and type as the section of main the lateral discharges into, as indicated on the Drawings. The only exceptions to this shall be when tapping into existing clay main. When tapping a clay main, the Contractor shall install a polyester tapping saddle as per manufacturer's recommendations. The service pipe shall be PVC SDR 26, unless otherwise specified on the Drawings.

PART 3 – EXECUTION

3.1 GENERAL

A. Connection of a sewer service to a building sewer shall not be accomplished until the newly constructed main has been certified by the Engineer and accepted by the Owner for use, furthermore, the system has to be tested to meet Manatee County Public Works and Utility Standards.

B. All appurtenances necessary for the construction of sewer services shall be installed in accordance with the manufacturer's recommendations.

END OF SECTION 33 16 00

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SECTION 33 35 00 – FITTINGS

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The Contractor shall furnish and install fittings as shown on the Drawings or as directed by the Engineer.

1.2 QUALITY ASSURANCE

A. The Contractor shall install fittings to meet the latest requirements of the Manatee County Public Works and Utilities Standards for all utility improvements.

1.3 SUBMITTALS

A. Submit manufacturer's certificate of conformance.

B. Shop Drawings: Submit manufacturer's drawings and data sheets for material to be supplied under this Section. Indicate sizes and types to be installed, per the requirements in Section 01 33 00 - Submittals.

C. Submit a pipe-laying schedule.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Upon delivery and before unloading, the Contractor must inspect the fittings for any damage occurred in transit and note such damage on the delivery ticket.

B. The means by which the fittings are unloaded is the decision and responsibility of the Contractor. The Contractor shall follow recommendations of the manufacturer.

C. The Contractor shall follow manufacturer's recommendations for storage of fittings in order to minimize damage prior to installation.

D. The Contractor shall adhere to the standard procedures given by the manufacturer for handling the fittings.

PART 2 – PRODUCTS

2.1 BENDS, REDUCERS AND TEES

A. Non-Pressure Pipe: All bends, reducers and tees required shall conform to the same standards as the pipe.

B. Pressure Pipe: All bends, reducers and tees required shall conform to the following requirement:

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1. Ductile Iron Fittings: Shall be used for all pressure pipe. They shall conform to the latest revision of AWWA C110 "Gray-Iron and Ductile-Iron Fittings, Three Inches Through Forty Eight Inches for Water and Other Liquids". They shall be mechanical joint ends with a pressure rating of 250 psi. Compact fittings, three through sixty-four inches (3"-64") will be acceptable. The compact fitting shall conform to the latest revision of AWWA C153 "Ductile Iron Compact Fitting, Three Inches Through Sixty-four Inches for Water and Other Liquids". All joints materials, including rubber gaskets, glands, tee-head bolts, and hex-head nuts, shall conform to the latest revisions of AWWA C111, "Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings".

2. Solid sleeves and adapter fittings shall be long body pattern and conform to the latest revision of AWWA C110 Gray-Iron and Ductile-Iron fittings, three through forty-eight inches (3”-48") for water and other liquids.

2.2 JOINT RESTRAINT SYSTEM

A. Restraint system for fittings shall be "MEGA LUG 1100 Series" Joint Restraint System as manufactured by EBAA Iron, Inc. or equal. The Engineer shall determine length and location of restraining. All fittings shall be restrained as shown on the plans.

2.3 SLEEVES

A. Connection of existing water or force mains to the new mains will be accomplished with solid repair sleeve, as approved by the Engineer. Repair clamps will not be allowed.

2.4 LININGS (NOT USED)

A. For sewer and other piping, the liners shall be in accordance with Section 33 43 01, Ductile Iron Pipe/Fitting Liners.

2.5 CORROSION PROTECTION (NOT USED)

A. Corrosion protection shall be in accordance with Section 33 42 00, Ductile Iron Pipe.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Installation of ductile iron pipe (DIP) fittings shall be in accordance with the latest revision of AWWA C600, "Installation of Gray and Ductile Cast Iron Water Mains and Appurtenances" for ductile iron. For PVC fittings, installations shall be in accordance with manufacturer's recommendations.

B. Concrete thrust blocks or "kickers" may be installed at all fittings fourteen inches (14") and smaller, as shown on the detail, if directed by the Engineer. The Contractor shall install a poly barrier between all concrete thrust blocks and fittings.

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Where in the opinion of the Engineer, conditions prevent installing a concrete thrust block behind a fitting, a joint restraint system shall be used in lieu of the concrete thrust block. Joint restraint system shall be installed in accordance with manufacturer's instructions so as to prevent joint separation under operating conditions on all fittings sixteen inches (16") and larger. The Engineer shall inspect all concrete thrust blocks prior to backfill. NOTE: Concrete thrust blocks shall not be installed in a "wet" condition.

END OF SECTION 33 35 00

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SECTION 33 50 00 - POLYVINYL CHLORIDE (PVC) PIPE

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The extent of PVC pipe is shown on the drawings.

B. Reference to standard specifications herein shall be construed to mean the latest edition or revision of the Manatee County Public Works and Utilities Standards for all utility improvements.

1.2 SUBMITTALS

A. One (1) original certified test report and two (2) copies of all required test reports should be submitted to the Engineer with each shipment of pipe. Certification shall include all test results required by AWWA. Also the Contractor shall include the following data:

1. Quick Burst Test, ASTM D1599.

2. Drop Impact Test, ASTM D2444.

1.3 DELIVERY AND STORAGE

A. Upon delivery and before unloading, the Contractor must inspect the pipe for any damage occurred in transit and note such damage on the delivery ticket.

B. In storing pipe, units shall be protected by dunnage in the same way they were protected while loaded on the truck. Pipe shall be stored flat to protect against bending. If pipe is to be stored outside longer than seven (7) days the pipe shall be covered with canvas or other opaque material to protect it from prolonged exposure to the sun.

PART 2 – PRODUCTS

2.1 PVC PIPE (4-INCHES AND LARGER)

A. USES OF PIPE

1. WATER: Unless otherwise shown on the plans, PVC water pipe four inches (4") through twelve inches (12") shall be DR-18, Class 150 and meet the requirements of AWWA C900 for PVC pipe in ductile iron pipe equivalent O.D., having elastomeric gasket bell ends and elastomeric seals. Blue in color for water. PVC water pipe fourteen inches (14") and greater for utility mains shall conform to the requirements of AWWA standard C905, DR-18, with working pressure rating of 235 psig.

2. SEWER: Force main pipe from four inches (4") up to twelve inches (12") shall be DR-18, Class 150 and meet the requirements of AWWA C900 for PVC pipe in ductile iron pipe equivalent O.D., unless otherwise specified with Construction Plans. Pipe shall be furnished in standard 20-foot lengths.

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PVC sewer force main pipe fourteen inches (14") and greater shall conform to the requirements of AWWA standard C905, DR-18, with a working pressure rating of 235 psig. Gravity sewer pipe shall be SDR-26, D-3034 ASTM. Green in color for sewer pipe.

3. REUSE: Unless otherwise shown on the plans, PVC reuse pipe four through twelve inches (4" -12") shall be DR-18, Class 150 and meet the requirements of AWWA C900 for PVC pipe in ductile iron pipe equivalent O.D., having elastomeric gasket bell ends and elastomeric seals. Purple in color for reuse water. PVC pipe fourteen inches (14") and greater shall conform to the requirements of AWWA standard C905, DR-18, with a working pressure rating of 235 psig.

4. GENERAL: PVC pipe fourteen inches (14") and larger for utility mains shall be SDR-25, Class 165, blue in color for water, green for gravity and force main, and purple for effluent. Pipe shall meet the requirements of AWWA standard C905.

B. The joints for PVC pipe (pressure and gravity) shall be rubber ring type consisting of integral, thickened, solid wall bells, which maintain the same standard dimension ratio as the pipe barrel. Joint lubrication shall be as furnished by the manufacturer of the pipe and joints made in accordance with the manufacturer's instructions and recommendations.

C. Where necessary, solid repair sleeves or adapter fittings shall be furnished and installed where plastic pipe is connected to pipes or fittings of other materials. When pipe material changes from one type to another, long pattern solid repair sleeves shall be used to transition.

2.2 PVC PIPE (SMALLER THAN 4-INCHES)

A. Unless otherwise specified, all PVC pipes smaller than four inch (4") nominal diameter shall be Schedule 80 PVC in accordance with ASTM D1785. Schedule 80 pipe shall have either solvent welded or threaded joints. PVC pressure pipe shall bear the approved seal of the National Sanitary Foundation (NSF). PVC pipe that is exposed to sunlight shall be manufactured with additives to provide resistance to ultraviolet deterioration.

B. FITTINGS: Socket type, solvent welded fittings for schedule 80 PVC pipe shall be in conformance with ASTM D2467. Threaded type fittings for Schedule 80 PVC pipe shall be in conformance with ASTM D2464. All solvent welded or threaded joints shall be watertight.

C. FLANGES: Flanges for Schedule 80 PVC pipe shall be rated for a 150 psi working pressure with ANSI B16.1 dimensions and bolting pattern. Flanges shall be connected to PVC piping with either solvent welded or threaded joints in accordance with ASTM D2467 or ASTM 2464, respectively. Gasket shall be neoprene; full faced type with a minimum thickness of 1/8". Nuts and bolts shall be hexagonal with machine threads, manufactured of Type 316 stainless steel in accordance with ASTM A320, Class 2. Type 316 stainless steel flat washers shall be used against PVC flanges.

D. SOLVENT CEMENT: PVC solvent cement shall be in compliance with ASTM Standard D2564 and in accordance with the pipe manufacturer's recommendations.

E. THREAD LUBRICANT: Lubricant for Schedule 80 threaded joints shall be Teflon tape only.

PART 3 – EXECUTION (Not Used)

END OF SECTION 33 50 00

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SECTION 33 60 00 - HIGH DENSITY POLYETHYLENE (HDPE) PIPE

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of the HDPE pipe is shown on the drawings.

B. Reference to standard specifications herein shall be constructed to mean the latest edition or revision of the Manatee County Public Works and Utilities Standards for all utility improvements.

1.2 SUBMITTALS

A. One (1) original certified test report and two (2) copies of all required test reports shall be submitted to the Engineer with each shipment of pipe. Certification shall also include all test results required by AWWA.

1.3 DELIVERY AND STORAGE

A. In storing pipe, units shall be protected by dunnage in the same way they were protected while loaded on the truck, pipe shall be stored flat to protect against bending.

B. In storing pipe, units shall be protected by dunnage in the same way they were protected while loaded on the truck. If pipe is to be outside longer than 15 days the pipe shall be covered with canvas or other opaque material to protect it from prolonged exposure to the sun.

PART 2 – PRODUCTS

2.1 HIGH DENSITY POLYETHYLENE (HDPE) PIPE

A. HDPE pipe and fittings shall be a PE3408 high density, extra-high molecular weight polyethylene manufactured from first-quality high density polyethylene resin containing no additives, fillers, or extenders. The HDPE pipe shall have an ASTM D3350 cell classification of PE 345434C, and shall meet or exceed the properties listed in Table 02618-1 of this specification. The HDPE pipe shall meet the requirements of AWWA C906 and shall match ductile iron OD pipe sizing. The HDPE pipe and fittings shall be SDR-11 Phillips Driscopipe Series 1000, Chevron Plexco, or approved equal, and shall bear the approval seal of the National Sanitation Foundation (NSF).

B. Joints: A continuous pipe shall be formed by butt fusing sections of pipe using manufacturer-approved equipment. The fused joints shall have equal or greater tensile and hydrostatic strength than the pipe.

C. Fittings shall be MJ DIP meeting the requirements of Section 33 35 00. The pipe shall have fusion welded restrainer ring, follower gland, and a twelve inches (12”) stainless steel insert for the MJ connection.

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PART 3 – EXECUTION

3.1 TESTING HDPE PIPE

A. Testing of the pipe system shall meet Manatee County standards.

Table 02618-1

Property	Specification	Unit	Nominal Value
Material Designation	PPI/ASTM		PE 3408
Material Classification	ASTM D-1248		III C 5 P34
Cell Classification	ASTM D-3350		345434C
Density	ASTM D-1505	gm/cm^3	0.955
Melt Index	ASTM D-1238	gm/10 min.	0.11
Flex Modulus	ASTM D-790	psi	135,000
Tensile Strength	ASTM D-638	psi	3,200
HDB @ 73NF	ASTM D-2837	psi	1,600
U-V Stabilizer	ASTM D-1603	% C (Carbon Black)	2.5
Hardness	ASTM D-2240	Shore “D”	65
Compressive Strength (yield)	ASTM D-695	psi	1,600
Tensile Strength @ Yield (Type VI Spec.)	ASTM D-638 (2”/min.)	psi	3,200
Elongation @ Yield	ASTM D-638	%, minimum	8
Tensile Strength @ Break (Type VI Spec.)	ASTM D-638	psi	5,000
Elongation @ Break	ASTM D-638	%, minimum	750
Modulus of Elasticity	ASTM D-638	psi	130,000
Linear Thermal Expansion Coefficient	ASTM D-696	in./in./NF	1.2×10^{-4}
Brittleness Temperature	ASTM D-746	NF	<-180
Vicat Softening Temperature	ASTM D-1525	NF	257

END OF SECTION 33 60 00

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SECTION 33 70 00 - VALVES AND ACCESSORIES

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The Contractor shall furnish and install all gate valves, butterfly valves, plug valves, check valves, and other special valves and piping accessories as shown on the drawings and as specified herein and to meet the latest requirements of the latest edition or revision of the Manatee County Public Works and Utilities Standards for all utility improvements.

B. Valve input shaft shall be furnished with a two inch (2”) square AWWA operating nut with an arrow cast on to show the direction of turning to close the valve.

C. Extension shaft as manufactured by the valve manufacturer shall be provided to place the operating nut between six inches and eighteen inches (6”-18”) below proposed grade along with stainless steel centering plate.

D. Contractor shall install a brass disk within the valve pad according to standard detail.

1.2 SUBMITTALS

A. The Contractor shall submit:

1. Shop drawings or manufacturer's product data on all items in PART 2.

2. One (1) original certified test report and two (2) copies of the test reports. Certification shall include all test results required by AWWA. The test shall include, but not be limited to the following: Hydrostatic and leakage tests conducted in accordance with AWWA C504, Section 12.

PART 2 – PRODUCTS

2.1 GENERAL REQUIREMENTS

A. All valve operators shall be designed as not to require over 80 pounds pull to meet the required torque to operate the valves.

B. All manually operated, shut-off or isolation valves, above grade, shall be furnished with handwheel or lever operators.

C. All manually operated, shut-off or isolation valves that are mounted over six (6) feet above finish floor elevations shall be furnished with chain wheel operators. Chain for chain wheel operators shall be galvanized or stainless steel.

D. All manually operated, shut-off or isolation valves, below grade, shall be furnished with AWWA two inch (2”) square actuating nuts and valve boxes. Valve boxes shall consist of cast iron base and adjustable top section with cover which shall be marked for the appropriate service, i.e. "WATER", "SEWER", "REUSE", etc.

E. Where called for on the drawings, electric valve actuators shall be provided. The electric actuators shall be powered by a high torque, reversible motor with integral thermal overload protection. The gear train shall be heat treated high alloy steel and shall be sized to withstand all imposed valve torque loads.

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The gear train shall be permanently lubricated. The actuator shall be furnished with a manual override capable of preventing electrical operation of the actuator when the override is engaged. The actuator, complete with integral positioner, shall be housed in a NEMA 4 enclosure and shall operate on 120 VAC, 1-phase, 60 Hz power supply.

F. All valves shall open by turning to the left or counter-clockwise when viewed from the stem. The operating nut shall have an arrow cast in the metal indicating the direction of opening. Each valve shall have the manufacturer's distinctive marking, pressure rating and year of manufacture cast on the body. All valves shall be tested in accordance with applicable AWWA pressure testing procedures.

G. All valves shall be corrosion protected in accordance with Section 33 42 00 of this document.

2.2 GATE VALVES

A. Resilient seat gate valves shall be ductile iron bodied, bronze mounted, resilient rubber seated with wedge type disk. Valves shall be manufactured in accordance with AWWA C515. Valves shall be suitable for buried service, be designed for 200 psi working pressure, shall be of O-ring type, and shall have a permanently lubricated thrust collar sealed with an O-ring above and below. Valves shall have mechanical joint ends, except above ground valves shall be flanged. Valves shall be coated in accordance with AWWA C550, as manufactured by Mueller. No substitutions allowed.

2.3 BUTTERFLY VALVES

A. Butterfly Valves (for liquid service):

1. Butterfly valves shall conform to AWWA C504. Laying length of all classes shall be per Table 1 (AWWA C504), short body. Valves shall be rated at 150 psi working pressure. Valves shall be bubble tight at rated pressures and be satisfactory for applications involving valve operation after long periods of inactivity. Valves shall have mechanical joint ends for buried service and flanged joints in the vaults and above grade. Butterfly valves shall be as manufactured by Pratt, Mueller, U.S. Pipe and Foundry, or McWane.

2. Valve body shall be ductile iron per AWWA C504 with integrally cast hubs for shaft bearing housing. All exterior bolts, nuts, studs, and washers, including mechanical joint bolting accessories, shall be stainless steel.

3. The valve disc shall be of heat-treated ductile iron, cast iron or alloy cast iron per ASTM A126, Class B, with a 316 SST edge. All materials shall meet AWWA C504. The disc shall rotate 90 degrees from full open to tight shut position. The contractor shall verify clearance dimensions required for the valve disc to be compatible with the pipe.

4. Valve shaft shall be of a solid one-piece design or stub shaft. Shaft, taper pins, lockwashers and nuts shall be Type 304 or 316 stainless steel. A shaft seal and bronze gland follower, studs and nuts shall be provided in the valve body. Shaft seals shall be in accordance with Section AWWA C504 for Class 150B, of the O-ring or split "V" type, suitable for buried service.

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5. Valve seat shall be of molded natural or synthetic rubber, recess mounted, bonded to the valve body. All mechanical securing devices shall be stainless steel. Seats shall not be located on the disc.

6. Valves shall be fitted with sleeve type bearings of self-lubricating corrosion resistant material.

7. Valve operators shall be in accordance with AWWA C504 and for buried service shall be permanently lubricated with totally enclosed gearing and designed to operate indefinitely either buried or fully submerged. All operator components between the input and stop limit shall be designed to withstand, without damage, a pull of 200 foot-pounds for hand wheel or chain wheel operators and an input torque of 300 foot-pounds for operating nuts. Operators shall be designed to require not over 150 foot-pounds to meet the required operating torque. Operators shall be designed to hold the valve disc in any intermediate position between fully closed and fully open without creeping or fluttering.

8. All valves shall receive a protective inside lining. The lining shall be a two-part thermosetting epoxy protective lining and shall function as a physical, chemical and electrical barrier between the base metal to which it is applied and the surroundings. The lining shall be approved by both AWWA and NSF61. The lining shall be nontoxic and shall not impart taste to water. The lining must be formulated from materials deemed acceptable per the FOOD AND DRUG ADMINISTRATION DOCUMENT TITLE 21 of the FEDERAL REGULATIONS ON FOOD ADDITIVES, SECTION 121.2514 entitled, RESINS AND POLYMERIC COATINGS.

2.4 CHECK VALVES

A. General:

1. Check valves shall be installed where shown on the drawings.

B. Swing Check Valves:

1. Check valves three inches (3”) and larger shall be horizontal swing check valves of the iron body bronze mounted, full opening type. Check valves shall be in accordance with AWWA C508 and equipped with outside levers and weights. Check valves smaller than three inches (3”) shall be bronze, suitable for the service required.

2. Swing check valves shall be used at all locations where a specific type of check valve is not specified or noted on the drawings. Swing check valves shall be American Flow Control, McWane, Mueller, or U.S. Pipe and Foundry. No substitutions allowed.

C. Rubber Flapper Check Valves:

1. Check valves shall be rubber flapper swing check valves of long pattern design (not wafer). Check valves shall have a heavy ductile iron body. Cover, bolts, nuts, and washers shall be 304SS; flange gaskets shall be rubber. Flapper shall be Buna-N with an O-ring seating edge, an elastic spring, molded internally, and shall be reinforced with steel. The flapper shall be easily removed from the check valve without needing to remove the valve from the line. Check valves will have full pipe size flow area. Check valves shall be APCO, Val-Matic, or Crispin rubber flapper swing check valves. No substitutions allowed.

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2.5 PVC BALL VALVES

A. Ball valves shall be the true union types, PVC (rigid, unplasticized, Type 1, polyvinyl chloride). PVC Ball Valves shall be of the full port area type with Teflon seat and "T" handle manufactured by Hayward Manufacturing Co., Inc., or equal, as per AWWA 507.

2.6 PLUG VALVES

A. Plug valves shall be of the non-lubricated eccentric round port design. Valves shall be designed for a working pressure of 175 psi through twelve inches (12”) and 150 psi for fourteen inches (14”) and larger. Plug valves shall be Pratt or Milliken. No substitutions allowed.

B. Plug valves up through twenty-four inches (24”) shall have a round port. Plug valves thirty inches (30”) and larger may have a rectangular port.

C. The valve plug shall be constructed of cast iron ASTM A126, Class B, with Buna-N resilient seating surface to mate with the body seat.

D. Plug valves shall be furnished with permanently lubricated grit excluder seals to isolate the bearings.

E. Plug valve shaft seals shall be the self-adjusting type. All packing shall be replaceable without removing the valve bonnet.

F. Each valve shall be given a test against the seat at the full rated working pressure and a hydrostatic shell test at twice the rated working pressure. Certified copies of individual tests shall be submitted when requested. Certified copies of proof-of-design tests shall be submitted upon request.

G. Manual valves shall have a worm gear type actuator with handwheels, two inch (2”) square nuts, chainwheels attached. Worm gear type actuators shall be furnished on all six inches (6”) or larger valves where the maximum unseating pressure is 25 psig or more.

H. All valves shall receive a protective inside lining. The lining shall be a two-part thermosetting epoxy protective coating Amercoat 400 or equal and shall function as a physical, chemical and electrical barrier between the base metal to which it is applied and the surroundings.

2.7 FLANGED COUPLING ADAPTERS

A. Flanged coupling adapters shall be used for joining plain end pipe to flanged valves, pumps, and fittings located as shown on the drawings and/or as required. The adapters shall be equipped with anchor studs designed to withstand the end thrust of the piping. Harnessing shall be provided on sizes above twelve inches (12”).

1. The flanged adapters shall be fabricated steel, Rockwell International Type 913, Baker Type 602, or Dresser Type 128. No substitutions allowed.

2.8 WATER AND REUSE AIR RELEASE VALVE

A. Air release valves shall be two inch (2”) size manufactured by Val-Matic (Model #38), Crispin (Model PL10A), or equal**.** Air release valves shall comply with AWWA C512.

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B. Valve Construction:

1. Air valves for vertical turbine pumps shall be designed to allow large quantities of air to escape out the orifice when the pump is started and close watertight when the liquid enters the valve. The air valve shall also permit large quantities of air to re-enter through the orifice when the pump is stopped to prevent a vacuum from forming in the pump column.

2. The valve shall consist of a body, cover, baffle, float and seat. The baffle will be designed to protect the float from direct contact of the rushing air and water to prevent the float from closing prematurely in the valve. The seat shall be fastened into the valve cover, without distortion, and shall be easily removed, if necessary.

3. The entire float and baffle assembly must be shrouded with a perforated water diffuser to prevent the water column entering the valve, from slamming the float shut and eliminate water hammer in the system.

4. The discharge orifice shall be fitted with an adjustable throttling device to regulate the flow of air escaping to establish a pressure loading on the rising column of water to minimize shock to the pump and check valve.

5. The float shall be stainless steel, designed to withstand a minimum of 1000 psi. The float shall be center guided and not free floating for positive seating.

6. Valve exterior to be painted with red oxide phenolic primer paint as accepted by the FDA for use in contact with potable water.

7. All materials of construction shall be certified in writing to conform to ASTM specification as follows:

Body, Cover & Baffle	Cast iron	ASTM A48, Class 30
Float	Stainless Steel	ASTM A240
Seat	Buna-N	
Water Diffuser	Brass	Commercial
Throttling Device	Malleable iron	Commercial

8. Valves shall also be furnished with a discharge pipe. Pipe shall be sized to fit outlet as specified using SCH 80 PVC pipe with turn down elbows.

2.9 VALVE BOXES

A. Valve boxes shall be the 5-1/4” standard cast iron two-piece, screw type valve box with drop cover marker "WATER." The marker shall denote type of service, i.e. “WATER”, “SEWER”, “RAW”, “REUSE”, etc. They shall be of sufficient height to allow them to be raised an additional two inches (2”) above the final elevation at each location that a valve is required on this project. PVC sleeves will not be allowed. Valve boxes shall be manufactured in the United States of America.

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2.10 SLEEVES

A. Sleeves shall be cast iron and of the size and in the location shown on the drawings. Sleeves shall comply with Section 33 43 01 of this document.

2.11 GAUGES

A. Gauges shall be furnished for the discharge side of all pumps and downstream side of pressure sustaining valves. Gauges shall be bourdon tube types, with bronze movement, plexiglass covers and shall be 4-1/2" in diameter.

Each gauge shall have a 1/4" NPT pumped liquid flushing connection with brass level handle blow-off petcock. All surfaces exposed to the pumped liquid shall be of stainless steel. Gauges shall be calibrated in feet. All pump discharge gauges shall be equipped with electrical contacts for pump failure indication. The contacts shall be field adjustable and have a contact rating of 1/4 A 120 VAC. Gauges for sewage shall be oil filled and be constructed with a diaphragm to prevent contact between the wastewater and the gauge. All gauges must be preapproved by the Engineer before ordering.

2.12 WASTEWATER COMBINATION AIR RELEASE VALVES

A. Wastewater combination air release valves with accessories shall be of the type to provide both air release and air/vacuum protection by venting air and gases, which accumulate during system operation. The valve shall have a two inch (2") N.P.T. inlet with a discharge size of one inch (1") N.P.T. and a one 1/4" orifice or comparable sizes for venting at a maximum working pressure of 100 psi. The valve assembly shall have stainless steel ball valves for isolation and backwash. Air release valves shall be made of cast iron body and cover, fusion bonded epoxy protective coating, or equal, inside and out, SST trims and floats with Buna-N-seat for positive seating. Air release valves shall be Val-Matic 801 ABW, Crispin US10SB-SC, or ARI D-025-S. No substitutions allowed.

B. Backwash accessories shall be furnished and assembled to the air release valve, consisting of a two inch (2") inlet shut-off stainless steel ball valve, a supply water inlet SST ball valve, rubber supply hose, rubber drain hose and quick disconnect couplings. Hoses to be a minimum five (5) feet length each.

C. Air release valves shall also be furnished with one inch (1") outlet drain piping or hose. Pipe shall be sized to fit outlet as specified using SCH 80 PVC pipe with turn down elbows.

PART 3 – EXECUTION

3.1 SETTING VALVES AND BOXES

A. Valves and valve boxes, as specified in the preceding paragraphs, shall be installed where shown on the drawings, unless otherwise directed. Valves shall be set plumb with the base of the valve box centered over the valve and resting on compacted backfill. The valve box shall not rest on the valve body or operating stem. The top section of the box shall be set to allow equal movement above and below finished grade. After being correctly positioned, fill shall be carefully tamped around the valve box for a distance of four (4) feet on all sides of the box. In paved areas, top of the cover shall be flush with the finished paving. In off-street areas, the cover shall be set one inch (1") above existing grade, unless otherwise directed by the Engineer, and a concrete pad shall be poured around the top of the box, as shown in the standard details.

END OF SECTION 33 70 00

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SECTION 33 72 00 - TAPPING SLEEVES AND TAPPING VALVES

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The Contractor shall furnish and install tapping sleeves and tapping valves as shown on the drawings or as directed by the Engineer.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Section 01 33 00 – Submittals

B. Section 33 50 00 – Polyvinyl Chloride (PVC) Pipe

1.3 QUALITY ASSURANCE

A. Install tapping sleeves and tapping valves to meet the latest edition or revision of the Manatee County Public Works and Utilities Standards, manufacturer's recommendations, and AWWA C500.

1.4 SUBMITTALS

A. Submit manufacturer's certificate of conformance.

B. Shop Drawings: Submit manufacturer's drawings and data sheets for material to be supplied under this Section. Indicate sizes and types to be installed.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Upon delivery and before unloading, the Contractor must inspect the valves for any damage occurring in transit and note such damage on the delivery ticket.

B. The means by which the tapping sleeves and tapping valves are unloaded is the decision and responsibility of the Contractor. He should follow recommendations of the manufacturer.

C. The Contractor shall follow manufacturer's recommendations for storage of tapping sleeves and tapping valves in order to minimize damage prior to installation.

D. The Contractor shall adhere to the standard procedures given by the manufacturer for handling the material.

PART 2 – PRODUCTS

2.1 TAPPING SLEEVES

A. Tapping sleeves for connection to existing water mains or force mains shall be of the mechanical joint type suitable for working pressures of 200 psi and shall be Mueller T-2360

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or approved equal. Lugs, nuts, bolts and washers shall be 304 stainless steel. The tapping sleeve shall be JCM 432 or approved equal.

B. Tapping sleeves for connection to existing pipe shall be suitable for the appropriate type of pipe to be tapped. Contractor shall be responsible for uncovering and determining type, class and the exact O.D. of the pipe to be tapped prior to ordering material.

2.2 TAPPING VALVES

A. All tapping valves shall conform to the latest revision of AWWA C500, "AWWA Standards for Gate Valves for Ordinary Water Works Service". The tapping valve shall be flanged inlet with centering lip, Class 125, ANSI B16.1 with mechanical joint outlet. Valve shall be resilient seat type by Mueller or approved equal.

B. All tapping valves shall be suitable for working pressures of 200 psi. Valves shall be of standard 200 psi manufacture and of the highest quality both as to materials and workmanship.

C. All tapping valves shall be furnished with mechanical joint end connections, unless otherwise shown on the Drawings or specified hereinafter and shall be compatible with the tapping sleeve used.

D. All tapping valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working water pressure cast on the body of the valve.

E. Gate valves shall be provided with a two inch (2”) square operating nut and shall be opened by turning to the left (counter-clockwise).

2.3 VALVE BOXES

A. Valve boxes shall be the 5¼" standard cast iron two-piece, screw type valve box with drop cover marker for all valves. The marker shall denote type of service, i.e. “WATER”, “SEWER”, “RAW”, “REUSE”, “REJECT”, etc. They shall be of sufficient height to allow them to be raised an additional two inches (2”) above the final elevation at each location that a gate valves is required on this Project. PVC sleeves will not be allowed.

PART 3 – EXECUTION

3.1 DESCRIPTION

A. All sleeves and valves shall be installed in accordance with the Standard Detail within the Drawings and in accordance with AWWA C600, "Installation of Gray and Ductile Cast-Iron Water Mains and Appurtenances".

3.2 WET TAPS

A. Wet taps on existing water mains shall be performed by an approved Contractor in the presence of the applicable agency inspector and Engineer. The Contractor shall pay any required fees for each wet tap required.

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It is the Contractor's responsibility to install and test the tapping sleeve and tapping valve. The Contractor shall excavate a trench of sufficient size for the tapping machine and work.

3.3 TAPPING VALVE AND TEE TEST

A.. The assembly shall be tested at 150 psi for 30 minutes with zero loss in the presence of the applicable agency inspector and Engineer. The valve shall have a cap installed and shall be open during the test. After 30 minutes, the valve shall be closed and the valve seat shall be checked for leaks. Caution - do not pour thrust block before assembly has been tested and accepted by the Engineer.

3.4 THRUST BLOCKING

A. Concrete thrust blocks or "kickers" shall be installed behind all tapping sleeves in accordance with thrust block details. Thrust blocks shall be installed 48 hours prior to tapping.

3.5 VALVE BOXES

A. Valve boxes shall be accurately centered over valve operating nut, and backfilled, thoroughly tamping about them. Valve box bases shall not rest on the valves but shall be supported by crushed stone fill. They shall be set vertically and properly cut and/or adjusted so that the tops of boxes will be at grade in any paving, walk or road surface, and two to three inches (2”-3”) above ground in grass plots, fields, woods or other open terrain. A 24" x 24" x 6" concrete pad shall be placed on valve box at finished grade, as per the Standard Details within the Drawings.

END OF SECTION 33 72 00

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DIVISION 01: GENERAL REQUIREMENTS

DIVISION 31: EARTHWORK

DIVISION 32: EXTERIOR IMPROVEMENTS

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