

ADVERTISEMENT TO BID

Sealed Bids will be received by the Town of Georgetown, 39 The Circle, Georgetown, Delaware 19947, until 3:00 p.m. on October 17, 2016, for the general construction of the Proposed Flow Meter – Del Tech Pump Station project, at which time the Bids will be opened publicly and read aloud.

Work includes:

Furnishing and installing new mag meter, pre-cast concrete meter vault, pipe, fittings and valves at the Del Tech sewer pump station. Also included would be miscellaneous electrical work to integrate the meter signal with the existing SCADA system, by-pass pumping as needed, and site restoration at the end of construction.

The Contract Documents may be examined at the following location: Town Hall, 39 The Circle, Georgetown, Delaware 19974.

Copies of the Contract Documents and Plans may be obtained by contacting Beacon Engineering, LLC (BEACON), Phone: 302.864.8825 or Email: info@beaconengineeringllc.com, upon payment of Sixty Dollars (\$60) for each non-refundable set. Checks should be made payable to Beacon Engineering, LLC. Bidders must obtain and review Contract Documents and Plans. Electronic versions of the Contract Documents and Plans are available at no charge.

The right is reserved, as the interest of the Town of Georgetown may appear, to reject any and all Bids, to waive any informality or irregularity in Bids received, and to accept or reject any Items of any Bid as is most advantageous to the Town of Georgetown.

~~Interested Bidders are encouraged to attend a mandatory Pre-Bid Meeting to be held on _____, 2016, at 9:00 a.m., at the Wastewater Treatment Plant at 24027 Cedar Lane, Georgetown, Delaware 19947.~~

The Town of Georgetown hereby notifies all that it will affirmatively ensure that in all Contracts it enters into, Minority Business Enterprises will be afforded full opportunity to submit Bids, and will not be discriminated against on the grounds of race, creed, color, sex, or national origin in consideration of an Award.

Town of Georgetown

Eugene S. Dvornick

Eugene S. Dvornick
Town Manager

09.30.16
Date



*Town of Georgetown
www.townofgeorgetown.com*

SECTION 01001

GENERAL CONDITIONS

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SECTION 01001

GENERAL CONDITIONS

1. GENERAL

It is the intent of the Specifications and Drawings to describe a complete project to be constructed in accordance with the Contract Documents. The Contract Documents comprise the entire Agreement between Owner and Contractor. They may be altered only by a modification.

The Contract Documents are complementary: what is called for by one is as binding as if called for by all. If the Contractor finds a conflict, error, or discrepancy in the Contract Documents, he shall call it to the Engineer's attention in writing at once, and before proceeding with the work affected thereby; however, he shall not be liable to the Owner or Engineer for his failure to discover any conflict, error, or discrepancy in the Specifications or Drawings. In resolving such conflicts, errors, and discrepancies the documents shall be given precedence in the following order: Agreement, Modifications, Addenda, General Conditions, Special Conditions, Information for Bidders, Specifications and Drawings. Figure dimensions on Drawings shall govern over scale dimensions, and detailed Drawings shall govern over General Drawings. Any work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials, or equipment, described in words which so applied have a well-known technical or trade meaning, shall be deemed to refer to such recognized standards. The work to be done under these specifications is to cover the completed work shown on the plans or called for in the specifications and other Contract Documents. The Contractor shall furnish all implements, machinery, tools, equipment, material and labor necessary to the performance of the work and shall furnish and do everything necessary to make the work perfect, complete, neat and finished, and the Contractor shall leave all the work to be done under this Contract in this condition at the time the work is finally inspected.

2. DEFINITIONS OF TERMS

- A. Whenever in these Specifications, Proposals, Agreement, Bond and other Contract Documents, the following terms or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

"Owner" or "Town of Georgetown"

Town of Georgetown, 39 The Circle, Georgetown, Delaware 19947.

"Engineer"

Consultant or Engineer for Owner or his duly authorized representative. Wherever the word Engineer is referred to in these specifications it can be substituted with the word "Owner" and he can at all times assume the responsibilities of the Engineer.

The Engineer is the firm of Beacon Engineering, LLC (BEACON), Georgetown, Delaware 19947, acting for the Owner as his duly authorized agent, said agent acting severally within the scope of duties contracted with the Owner.

Wherever the word Engineer appears in the Contract Documents, it is defined to mean this firm.

"Contractor"

Party responsible for constructing the work, acting directly or through his agents or employees.

"Subcontractor"

Any individual, firm or corporation who contracts with a Contractor to perform part or all of the latter's Contract.

"Contract" or "Contract Documents"

All things contained in the Specifications, Drawings, Proposals, Agreement and Bonds, and therein referred to, are to be considered as one instrument forming the Contract, also any and all supplemental agreements which could reasonably be required to complete the construction contemplated.

"Approved," "As Required," and Similar Expressions

Meaning shall be construed as "as approved by the Engineer" and "as required by the Engineer."

"Provide"

A direction to the Contractor to furnish all materials, equipment and labor and make payment for all of these necessary to complete the Contract.

"Work"

Any and all things agreed to be furnished or done by or on the part of the Contractor, and which are required in the construction and completion of the project herein contemplated. Includes also labor, material and equipment.

"Material" or "Materials"

Unless the context otherwise requires, these words or either of them, shall include equipment.

"Furnish"

A direction to the Contractor to supply and make payment for materials and equipment but not necessarily to install or pay workmen to install, or both, these items.

"General Conditions"

Provisions that establish and pertain to the legal responsibilities between the parties involved in the work, namely Owner, Engineer and Contractor.

"Surety"

The body corporate, approved by the Owner, which is bound with and for the Contractor who is primarily liable, and which engages to be responsible for his acceptable performance of the work for which he has contracted.

"Bidder"

Any individual, firm or corporation submitting a bid for the work contemplated, acting directly or through a duly authorized representative.

"Bid"

The approved prepared form on which the bidder is to submit or has submitted his bid for the work contemplated.

"Supplementary or Special Conditions"

Provisions specifically applicable to this work.

"General Requirements"

Instructions to the General Contractor relating to non-legal non-technical requirements for proper execution of the field work. These are instructions that cannot logically be placed anywhere else in the bidding documents.

"Acts of God"

A cataclysmic phenomenon of nature. Climatic and subsurface conditions of which may be abnormal for the area over all or part of the time span of the work, but which do not preclude prosecution of the work with the proper use of specified methods and equipment, shall not be considered as acts of God.

- B. The headings and subheadings printed in these Specifications are intended for convenience or reference only, and shall not be considered as having any particular bearing on the interpretation thereof.
- C. The Drawings accompanying these Specifications shall be held and taken to be "attached" hereto, whether or not said Drawing is physically attached hereto.
- D. Whenever, in the Specifications and upon the Drawings, the words Directed, Required, Permitted, Ordered, Designated, Prescribed and words of like import are used, it shall be understood that the directions, requirements, permission, order, designation, or prescription of the Engineer is intended and similarly the words Approved, Acceptable, Satisfactory, and words of like import shall mean "approved by, or acceptable or satisfactory to the Engineer unless otherwise expressly stated."

3. DRAWINGS AND SPECIFICATIONS

- A. Wherever the words "directed," "required," "ordered," "approved," "acceptable," or others of like import appear in the Specifications, they shall mean as directed, required, ordered, approved or acceptable by or to the Owner and by or to the Engineer acting as the Owner's agent.
- B. All reference to Federal or other standards appearing on the drawings or in the specifications shall mean the current edition. Where, in the specifications which follow, a standard is cited next to the name of a product or a test procedure, the product or test procedure shall conform to that standard.
- C. Up to 5 sets of drawings and specifications will be furnished the Contractor without charge. Additional sets will be furnished at cost stated in the Advertisement to Bid.
- D. The Contractor shall maintain, at the job site, 1 complete set of drawings and specifications. The Contractor shall record on this set and keep current, all authorized changes and field adjustments. The set shall be kept available for inspection by representatives of the Owner and the Engineer, and shall finally be used to assist in the preparation of as-built drawings.
- E. Locations of overhead and underground utilities shown on the drawings were derived from existing records and from field observations, in order to provide the Contractor with as much information as could reasonably be ascertained without actually

excavating and exposing subsurface utilities. The Owner and the Engineer do not warrant or guarantee the complete accuracy of the information shown. Some utilities may not be shown, and the location of those shown may not be entirely accurate.

- F. All incidental items of labor and materials not specifically delineated by the Contract Documents, but which are necessary to provide a fully operable facility, and which may reasonably be interpreted as being a part of the work, shall be accomplished by the Contractor without extra charge, the prices of which shall be included within the base bid items.

4. CONTRACT TIME

- A. The proposal states the number of consecutive work days allowed from date of "Notice to Proceed" to date of completion of the entire project under this Contract. For each and every day that the Contractor is in default in completing the Contract, as defined in the General Conditions and the bid, he shall pay the Owner liquidated damages in the amount stated in the Bid Form.
- B. The Owner reserves the right to take either or both of the following actions at any time, that in his judgment, it appears the scheduled completion date will not be met:
 - 1. Require the Contractor to assign additional construction forces to the work.
 - 2. Delete all or any portion of remaining work from this Contract and assign such work to another Contractor or accomplish same by any other method which may appear most advantageous.

These remedies are supplementary to all other provisions of the specifications and do not void such other provisions.

5. SUBCONTRACTING

- A. The Contractor shall submit, prior to commencement of construction, for review by the Engineer and the Owner, a final list of Subcontractors, including subcontractor name, the portion of work which he is to do, his place of business, and any other information the Engineer may require, as well as materials and equipment suppliers with whom he intends to Contract. If the Owner or the Engineer objects to any proposed subcontractor, materials or equipment supplier, the Contractor shall furnish such data as may be required to secure the Owner's and Engineer's approval. If such approval is

not then forthcoming, the Owner and the Contractor will negotiate the matter to a mutually acceptable conclusion, which negotiations may include a decrease or increase in Contract price.

- B. The Contractor shall not, either legally or equitably, assign any of the monies payable under the Contract, or his claims thereto, unless by and with the like consent of the Engineer.
- C. The Contractor shall not be released from any of his liabilities or obligations under this Contract should any subcontractor or subcontractors fail to perform in a satisfactory manner the work undertaken by him or them.

6. CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

The Contractor shall not commence work under this Contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on his subcontract until the insurance required of the Subcontractor has been so obtained and approved.

A. Compensation and Employer's Liability Insurance

The Contractor shall take out and maintain during the life of the Contract the statutory Workmen's Compensation and Employer's Liability Insurance for all his employees to be engaged in work on the project under the Contract shall and, in case any such work is sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation and Employer's Liability Insurance for all the latter's employees to be engaged in such work.

B. General Public Liability and Property Damage Liability Insurance

The Contractor shall take out and maintain during the life of the Contract, General Public Liability and Property Damage Liability Insurance to protect him and any Subcontractor performing work covered by the Contract from claims for damages for personal injury, including accidental death, as well as from claims for property damage, which may arise from operations under the Contract, whether such operations be by himself or by a subcontractor, or by anyone directly or indirectly employed by either of them, and the amount of such insurance should not be less than:

General Public Liability Insurance, in an amount not less than One Million Dollars (\$1,000,000) for injuries, including wrongful death to any one person, and subject to

the same limit for 2 or more persons in an amount not less than One Million Dollars (\$1,000,000) on account of 1 accident.

Property Damage Insurance, in an amount not less than Two Hundred Thousand Dollars (\$200,000) for damages on account of any 1 accident, and in an amount not less than Five Hundred Thousand Dollars (\$500,000) for damages on all accidents.

C. Special Hazards Insurance

In the event of the possibility of special hazards existing in the work contemplated, such hazards shall be covered by a rider to the policy or policies required under the subparagraph B in amounts not less than those stipulated under subparagraph B. If any special hazard is encountered during the performance of this Contract, the Contractor shall, prior to performing any work involving the special hazard, immediately proceed with the procuring of this insurance.

D. Builder's Risk Insurance (Fire and Extended Coverage)

The Contractor shall have adequate fire and standard extended coverage, with a company or companies acceptable to the Owner, in force on the project.

The insurance should provide protection at all times against loss by the Owner and Contractor until final acceptance of the work. This provision with respect to Builder's Risk Insurance shall in no way relieve the Contractor of his obligation of completing the work covered by the Contract.

E. Automobile Bodily Injury Liability Insurance

Automobile Bodily Injury Liability Insurance in an amount not less than One Hundred Thousand Dollars (\$100,000) for injuries, including death, to any 1 person and subject to the same limits for each person, in an amount not less than Three Thousand Dollars (\$300,000) on account of any 1 accident.

F. Proof of Carriage of Insurance

The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations, effective dates, and date of expiration of policies. Such certificates shall contain substantially the following statement: "The insurance covered by this certification shall not be canceled or materially altered, except after 30 day written notice has been received by the Owner."

7. SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

- A. In order to protect the lives and health of his employees under the Contract, the Contractor shall comply with all pertinent provisions of the Contract Work Hours and Safety Standards Act, as amended, commonly known as the Construction Safety Act as pertains to health and safety standards; and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work arising out of and in the course of employment on work under Contract.
- B. The Contractor, alone, shall be responsible for the safety, the adequacy of his work, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance or operation. The Contractor will comply, within the prices bid and without extra cost to the Owner, with all safety regulations or determinations issued by any agency of the Federal government including OSHA and the State of Delaware.

8. TESTS AND INSPECTIONS

- A. If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any Work to specifically be inspected, tested, or approved by some public body, the CONTRACTOR shall assume full responsibility, therefore, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection, testing, or approval.
- B. ENGINEER and his representatives, representatives of OWNER, the Sussex Soil Conservation District, OSHA, DNREC and other agencies having jurisdiction will at reasonable times have access to the WORK. CONTRACTOR shall provide proper and safe facilities for such access, inspection, and observation of the work and also for any inspection or testing within the prices bid thereof by others.

9. WORKING TIME

- A. The Contractor will not be permitted to work on holidays observed by the Owner or the State of Delaware or on Saturdays or Sundays unless otherwise authorized by the Town of Georgetown in writing.
- B. In case of an emergency, which may require that work be done on Saturdays, Sundays, or Holidays, the Contractor shall request permission of the Town Georgetown to do so.

If, in the opinion of the Town of Georgetown, the emergency is bonafide, he will grant permission to the Contractor to work such hours as may be necessary. Also, if in the opinion of the Town of Georgetown a bonafide emergency exists, he may direct the Contractor to work such hours as may be necessary whether or not the Contractor requests permission to do so.

- C. The Contractor will be allowed to work 8 hours per day, Monday through Friday, except for holidays, 52 weeks per year between the hours of 7:00 A.M. and 6:00 P.M. No work beyond this window of time shall be permitted unless otherwise noted in writing by the Town of Georgetown.
- D. Should the Contractor extend his work beyond these specified hours, unless otherwise agreed upon previously in writing, any and all cost of weekend, holiday, and/or overtime inspection incurred by the Contractor, Engineer, or Owner will be the sole obligation of the Contractor. Overtime cost for inspection will be backcharged to the Contractor at a rate of $\$50.00 \times 1.5 = \75 per hour. Costs for overtime inspection will be deducted from monthly Pay Requisitions.

10. PROTECTION OF PROPERTY AND STRUCTURES

- A. The Contractor shall, at his own expense, sustain in their places and protect from direct or indirect injury all pipes, wires, conduits, poles, tracks, walls, buildings, and other structures or property in the vicinity of his work whether above or below the ground, or that may appear in the trench. He shall at all times have sufficient quantity of timber and plank, chains, ropes, etc., on the site and shall use them as necessary for sheeting his excavations and for sustaining or supporting any structures that are uncovered, undermined, endangered, threatened, or weakened. The Contractor shall take all risks attending the presence of proximity of pipes, wires, conduits, poles, tracks, walls, buildings or other structures and property of every kind and description in or over his trenches or in the vicinity of his work whether above or below the surface ground, and he shall be responsible for all damage and assume all expense for direct or indirect injury caused by his work to any of them or to any person or property by reason of injury to them, whether such structures are or are not shown on the drawings.
- B. The Contractor shall take all necessary precautions to protect existing fences, property markers, driveways, curbing, sidewalk etc., including the replacement of any said items damaged through or as a result of the Contractor's operations to the satisfaction of the property owner and the Engineer. The Contractor shall coordinate and pay for

replacement of property monuments damaged. This work shall be performed by a surveyor licensed in the State where the damage occurred.

- C. All permanent construction will be within lands of the Owner, public Rights-of-Way or Rights-of-Way through private property acquired by the Owner and the Contractor shall confine his operations strictly within the limits of the Rights-of-Way and construction areas, unless he has written permission of the Owner of the adjacent property to occupy additional ground. A copy of the written permission shall be placed on file with the Owner.

- D. The Contractor shall not enter upon private property for any purpose without obtaining the property owner's permission, and he shall be responsible for the preservation of all public and private property, trees, shrubbery, monuments, and any and all natural or manmade objects, along and adjacent to the work and shall use every precaution necessary to prevent damage or injury to any and all property. The Contractor shall not willfully or maliciously injure or destroy trees or shrubs and shall not remove or cut them without proper written authority of the property owner. The Contractor shall be strictly responsible for any and all damage or injury of every kind and description which directly or indirectly may be done to any property or sustained by any persons during the prosecution of the work resulting from any wrong doing, misconduct, poor construction methods, or any negligence of himself or his agents and/or employees in his manner or method of executing said work or due to his non-execution of said work, even though such manner or method of said work be concurred in, permitted, or allowed by the Engineer or the Owner, its agents, and/or employees, or at any time due to defective work or materials. When or where any direct or indirect damage or injury is done to public or private property, by or on account of any act, construction method, omission, neglect or misconduct in the execution of the work, or in consequence of the non-execution thereof on the part of the Contractor, he shall restore, at his own expense, such property to a condition equal to that existing before such damage or injury was done by repairing, rebuilding, or otherwise restoring as may be directed, or he shall make good such damage or injury in an acceptable manner. In case of the failure on the part of the Contractor to restore such property or make good such damage or injury, the Engineer may, upon 48 hours notice, proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary, and the cost thereof may be deducted from any money due or which may become due the Contractor under this Contract. No extension of the Contract time will be allowed for any work or restoration covered by these requirements.

11. FORCE ACCOUNT WORK

- A. The Contractor shall perform extra work, for which there is no quantity and price included in the Contract, whenever required to complete fully the work contemplated it is deemed necessary or desirable, by written authority of the Engineer, and such work shall be done in accordance with the specifications therefore or in the best workmanlike manner as directed. This extra work will be paid for on force account basis by written authority of the Engineer. All extra work done on force account basis, the use of which has been solely determined and authorized in writing by the Engineer, will be paid for in the following manner:

Labor: For all labor and foremen in direct charge of the specific project, the Contractor shall receive as shown on his weekly payroll the basic hourly wage, overtime and fringe benefits paid in case to the employee for each and every hour that said labor and foremen are actually engaged in such work, to which cost shall be added an amount equal to fifteen percent (15%) of the sum thereof. The Superintendent's or office personnel's time will not be allowed.

Material: For material accepted by the Engineer and used, the Contractor shall receive the actual cost of such materials delivered for the work, including transportation charges paid by him to which the cost of fifteen percent (15%) will be added.

Equipment: For any machinery or special equipment including fuel and lubricants, plus transportation costs, the use of which has been authorized by the Engineer, the Contractor shall receive the rental rate agreed upon in writing before such work is begun for the actual time that such equipment is in operation on the work, to which rental sum fifteen percent (15%) will be added. In addition to the above, the actual transportation costs for 1 move in and 1 move out may be allowed. When the Owner is obligated to pay for idle equipment the allowance shall be seventy-five percent (75%) of the agreed on equipment rental rate. To compute hourly rates use 8 hours per day, 40 hours per week and 176 hours per month.

Subcontractors: For all work performed by subcontractors, the Contractor shall receive the rate billed to him by the subcontractor for each and every hour that said subcontractor is actually engaged in such work to which shall be added an amount equal to ten percentum (10%) of the sum.

Miscellaneous: No additional allowance shall be made for the General

superintendence of the project and related transportation, the use of small tools, or other costs for which no specific allowance is herein provided.

- B. The compensation as herein provided shall be received by the Contractor as payment in full for extra work done on a "force account" basis. The Contractor's representative and the Resident Project Representative (RPR) shall compare records of extra work on a "force account" basis at the end of each day. Copies of these records shall be made in duplicate, upon the Engineer's "force account forms" and signed by both the RPR and the Contractor's representative, 1 copy being forwarded respectively to the Engineer and to the Contractor. Claims for extra work performed on a "force account" basis shall be submitted to the Engineer, in triplicate, on certified forms properly executed, by the Contractor. Statements shall also include the value of all material used in such work, and said statements shall be filed not later than the fifteenth (15th) day of the month following that in which the work was actually performed, and shall include all charges which can be verified.
- C. For extra work, as defined in this paragraph, the Contractor will be reimbursed for his expenditures for Workmen's Compensation Insurance, Public Liability Insurance, Social Security taxes and Unemployment Compensation covering the workers actually engaged upon such extra work. No percentage will be added to such payments, but the Contractor shall receive only the actual amount of money expended for such Workmen's Compensation Insurance, Public Liability Insurance, Social Security taxes and Unemployment Compensation. Such Payments shall be based upon the prevailing standard insurance rates supported by receipted vouchers from the insurance vendors and upon the actual amount of taxes paid for Social Security and Unemployment Compensation as evidenced by proper documents furnished by the Contractor.

12. SCHEDULES, REPORTS AND RECORDS

- A. All items of work which require measurement shall be measured concurrently, upon installation and before covering or backfilling, by the Owner's representative and the Contractor's representative. All items so measured will be recorded by both parties in a format which can be kept current until completion of the work.
- B. Such measurement records shall be utilized to formulate and check partial and final requests for payment. Upon completion of the work, both sets of records shall be delivered to the Engineer for his use in the preparation of record drawings.

- C. All measurements, to the maximum extent possible, shall be referenced to base dimensions and stationing shown on the drawings.

13. ELIMINATED ITEMS

Should any items contained in the proposal be found unnecessary for the proper completion of the work contracted, the Engineer may, upon written order to the Contractor, eliminate such items from the Contract and such action shall in no way invalidate the Contract, and no payment will be made for the items so eliminated in making final payment to the Contractor except for such actual work as may have been done, and materials actually purchased prior to elimination of the scope of work.

14. CONTRACTOR'S LEGAL ADDRESS

- A. The address given in the bid or proposal is hereby designated as the legal address of the Contractor. Such address may be changed at any time by notice in writing delivered to the Engineer. The delivering at such legal address or the depositing in any post office, in a postpaid, registered wrapper directed to the above-mentioned address of any notice, letter and other communication to the Contractor, shall be deemed to be a legal and sufficient service thereof upon the Contractor.
- B. The delivering at or the mailing to the Contractor's business address (written notice of which address shall be given to the Engineer), or the delivering to the Contractor in person or to his authorized representative, of notices, letters and other communication shall also be deemed to be a legal and sufficient service thereof upon the Contractor.

15. ORDERING MATERIALS

- A. Delivery schedules for all materials and/or equipment specified herein or shown on the drawings, or in any way affecting the work, shall be reported to the Engineer within 10 days of the Notice to Proceed. The Engineer shall be notified immediately if any materials or equipment are not obtainable, or promised delivery dates are such as to seriously impede the work. Substitute materials, if required, shall be subject to approval by the Engineer. To meet the Contract time, Contractor may need to pay extra for expediting manufacture or delivery. The Contractor will be expected to include such costs within the base prices bid and to meet the project schedule.
- B. Contractor shall frequently check on continued validity of delivery dates and shall

advise the Engineer promptly of any change of delivery promises made by the suppliers. The Contractor shall expedite deliveries of materials controlling job progress.

- C. Shop Drawings and orders shall be handled expeditiously by the Contractor to avoid delays in the work.
- D. By submitting his bid, Contractor certifies that manufacturing and delivery schedules have been confirmed and validated and incorporated into his overall project schedule in a manner that will assure Contractor's control of the schedule and completion within the designated project period, and within the base prices bid.

16. BUILDING CODES

- A. The Contractor shall conform to the latest edition of International Building Code and NFPA 101 Life Safety Code. If the Contractor discovers questionable deviation from these code requirements, the Contractor is then required to notify the Engineer for confirmation.
- B. The Contractor shall conform to safety standards as set forth by the "Manual of Accident Prevention in Construction by Associated General Contractors of America, Inc", and O.S.H.A.

17. LAWS TO BE OBSERVED

The Contractor shall observe and comply with Federal, State, County, and Local laws, ordinances, rules, regulations, decrees and orders that are in effect and applicable to the work during the time of construction; and he shall see that his subcontractors likewise meet this requirement. He shall indemnify, and hold harmless, the Owner and his representatives against claims and liabilities arising from Contractor and subcontractor violations of such laws, ordinances, rules, regulations, decrees, and orders, whether such violations be by the Contractor or any subcontractor, or any of their agents and/or employees.

18. SUBSTITUTIONS

An offer of an article or material by the Contractor for an article of material specified, will raise the presumption that it is for the purpose of saving money. If, in such case, the articles or material is approved, the Owner shall be given credit as follows: the difference in the net cost

to the Contractor of the article or material submitted and the price at which he could have obtained the lowest priced article or material specified. For convenience in checking the credit, if any, the Contractor shall submit these figures when the offer is made, and no article or materials will be considered without figures.

19. PERMIT REQUIREMENTS, PERMITS, FEES, AND NOTICES

- A. Contractor shall perform all work shown on the drawings and required within these specifications in accordance with all authorities having jurisdiction and all applicable permits.
- B. Contractor shall pay taxes, royalties, and fees, and secure licenses that are required, during the time of the Contract, by Local, County, State and Federal laws, ordinances, rules, codes and regulations for the legal performance of the Contract.
- C. Contractor shall perform the work in accordance with notices issued by public authorities having jurisdiction over the work.
- D. If the Contractor performs work, knowingly or ignorantly, contrary to requirements of Local, County, State, and Federal laws, ordinances, rules, codes and regulations, he shall assume full responsibility therefore and shall bear all costs of suits, actions and damages resulting from his illegal work performed.

20. LOCATION OF EXISTING UTILITIES

- A. The Contractor's attention is directed to the fact that the location of the existing utilities shown on the contract drawings are approximate only. It shall be the Contractor's responsibility to locate these utilities, by test pits in the vicinity of the utilities prior to actual construction, within the base bid prices.
- B. The Contractor shall do all work, within the prices bid and without extra cost to the Owner, which is required to locate, protect, relocate, replace or repair all overhead and underground utilities shown or not shown on the drawings, as necessary for the construction of this project. He shall contact "Miss Utility" at 1-800-282-8555 and the Owner at least 48 hours prior to digging in the vicinity of existing underground utilities to have them located and marked.
- C. The failure to show on the contract drawings any existing utilities shall not relieve the

Contractor of his responsibility of determining the locations of these utilities, and any damage to the utilities or interruption of services shall be repaired by the Contractor according to Owner or utility company specifications. The Owner shall be notified of any damage to any utilities.

- D. The Contractor shall, within the unit prices bid and without extra cost to the Owner, pay all charges levied by utility companies for work performed by their forces to locate, inspect, protect, relocate, replace or repair overhead or underground utilities as necessary for the construction of this project.

21. COOPERATION WITH OTHER CONTRACTORS

- A. The Contractor shall cooperate with and so conduct his operations as not to interfere with or injure the work of other Contractors or workmen employed by the Owner. He shall promptly make good, at his own expense, any injury or damage which may be done by him or his employees or agents on the work.
- B. The Contractor shall suspend such part of the work herein specified, or shall carry on the same in such manner, as may be ordered by the Engineer when necessary to facilitate the work of such other Contractors or workmen.

22. RECORD DRAWINGS

The Contractor shall keep 1 copy of the drawings at the site, in good order and provide mark-up to show all changes made during construction. These as-built or record drawings shall be available to the Engineer, and shall be delivered to him upon completion of the Contract. The Engineer will compare the Contractor's mark-up to the Inspector's and prepare final record drawings for the Owner.

23. CONTRACTOR RESPONSIBILITY TO COORDINATE ALL SERVICES

During construction, testing, start-up and initial operation, and during the 1 year guarantee period, Contractor is solely responsible for coordinating the efforts of all parties responsible for work under this Contract. Should problems arise, Contractor shall promptly perform all tests necessary to trouble shoot and identify the problems and assure repairs are made by the appropriate subcontractors or suppliers as required to remedy any faults. Contractor shall respond to requests for services from the Owner or Engineer as soon as possible, but in no case, longer than 24 hours after receiving such request whenever a problem arises which

affects the proper operation of the work. The fault or defect shall be remedied as soon as possible. The Contractor shall provide emergency substitute equipment at his expense, if necessary, to keep the system operational during troubleshooting or repairs and shall bear all costs associated with such efforts.

24. PATENTS

- A. Whenever articles, materials, means, appliances, processes, compositions, combinations and things indicated by these specifications are covered by letters patent, the successful Bidder shall secure, before using or employing such articles, materials, means, appliances, processes, compositions, combinations or things, the assent, in writing, of the Owner or licensee of such letters patent and file the assent with the Engineer.
- B. The said assent is to cover not only the use, employment and incorporation of said articles, materials, means, appliances, processes, compositions, combinations or things in the construction and completion of the work, but also the permanent use of said articles, materials, means, appliances, processes, compositions, combination or things, thereafter by or on behalf of the Owner in the operation and maintenance of the project for the purpose for which it is intended or adapted.
- C. It is mutually agreed and understood that without exception, the Contract prices shall include all royalties or costs arising from the use of such design, device or materials in any way involved in the work.

25. DRAWINGS TO BE FOLLOWED

The approved plans, profiles, details and cross sections on file in the office of the Engineer will show the location, details and dimensions of the work contemplated, which shall be performed in strict accordance therewith and in accordance with the specifications. There shall be no deviation from the drawings and specifications on account of the exigencies of construction, unless approved and authorized in writing by the Engineer.

26. INTERPRETATION OF DRAWINGS

On all drawings, the figured dimensions shall govern in the case of discrepancy between the scales and figures. The Contractor shall take no advantage of any error or omission in the drawings or of any discrepancy between the drawings and specifications, and the Engineer will

make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the specifications, and of the drawings as construed by him. In all cases of doubt as to the true meaning of the specifications and drawings, the decision of the Engineer will be final and conclusive.

27. ALTERATION OF DRAWINGS AND CHARACTER OF WORK

The Engineer reserves the right to make such alterations in the drawings and in the character of the work as necessary or desirable, or both, from time to time to complete the construction of the work, provided such alterations do not change materially the original drawings and specifications; and such alterations shall not be considered as a waiver of conditions of the Contract, nor shall they invalidate any of the provisions thereof. Should such alterations in the drawings or in the character of work, or both, cause increased or decreased cost to the Contractor, a fair and equitable sum therefore, to be agreed upon in writing by the Contractor and Engineer before such work is begun, shall be added or deducted from the Contract price. No allowance will be made for anticipated profits on the work omitted.

28. ENGINEER MAY INCREASE AND DECREASE QUANTITIES

- A. Whenever the estimated quantities of work to be done and materials to be furnished on a unit price basis under this Contract are shown in any of the documents including the bid, they are given for use in comparing bids. The Engineer reserves the right to increase and decrease the amount or quantity of unit price items included in the bid wherever he deems it advisable or necessary to do so, and such increase or decrease shall in no way violate the Contract.
- B. The Contractor will be paid for the actual amount of quantity of authorized work done or materials furnished under any unit price item of the "Bid or Proposal", at the price bid and stipulated for such item. In case the amount or quantity of any item is increased as above provided, the Contractor shall not be entitled to any damages or increased compensation over and above the price bid for such items, and in case the amount or quantity of any item is diminished as above provided, the Contractor shall not have any claim for damages due to loss of anticipated profits or otherwise because of such diminution.

29. UNAUTHORIZED WORK

Work performed without Engineer's approval of lines and grades, work performed beyond the

lines and grades shown on the drawings or as given, except as herein provided, and extra work performed without written authority, will be considered as unauthorized and at the expense of the Contractor. Such work will not be measured by the Engineer, nor will payment be made by the Owner. Work so performed may be ordered, by the Engineer removed and replaced at the Contractor's expense.

30. EXECUTION OF WORK

- A. The Contractor shall begin the work to be performed under the Contract at the time stated in the Notice to Proceed, provided by the Engineer to the Contractor. The place where the work is to be started will be stated either in this Notice to Proceed or will be designated on the ground. The work shall be executed from as many different points, in such part or parts and at such times as may be directed, and shall be conducted in such a manner and with sufficient materials, equipment and labor as is considered necessary to insure its completion with the time set forth in the Contract.
- B. If the work should be discontinued because of unforeseen events, the Contractor shall immediately notify the Town of Georgetown. When the Contractor shall discontinue the work because of a planned stoppage, the stoppage shall not take place until the Town of Georgetown has authorized such stoppage; and work shall not be resumed until Contractor notifies the Town of Georgetown 24 hours in advance of starting work again.

31. COOPERATION OF CONTRACTOR AND REPRESENTATIVE

The Contractor shall give the work his constant attention to facilitate the progress thereof and shall cooperate with the Engineer and Owner. The Contractor shall have at all times a competent and reliable English-speaking representative on the work, authorized to receive orders and act for him.

32. EMPLOYEES AND EQUIPMENT

- A. Employees of the Contractor or persons connected with the Contractor shall be discharged upon request of the Engineer for any or all of the following reasons:
 - 1. Directing profanity or abusive language, or both, at the Resident Project Representative, the Engineer, and other Owner's representatives.
 - 2. Interfering with Resident Project Representative and other Owner's

representatives in performance of their work.

3. Disobeying or evading, or both, instructions of the Engineer or Owner's representatives.
4. Carelessness or incompetency, or both.
5. Being objectionable to the Owner.

Discharged employees shall not be rehired without consent of the Owner.

- B. Contractor shall furnish, and maintain in safe working condition, equipment necessary to properly perform the work in the scheduled time.

33. PUBLIC CONVENIENCE AND SAFETY

- A. The Contractor shall conduct the work in a manner that will minimize obstruction to traffic in the area. The safety and convenience of the general public and of the residents and occupants of property along and adjacent to the work shall be provided in an adequate and satisfactory manner. The Contractor shall provide and maintain ingress and egress for all residences and places of business located along the construction route. So far as practical, materials shall not be stored upon the highway. When it is absolutely necessary to do so, they shall be placed so as to cause as little obstruction to the traveling public as possible. Footways and portions of the highways and streams adjoining the work shall not be obstructed more than absolutely necessary. In no case shall any traveled thoroughfare be closed without permission of the Engineer.
- B. If, in the opinion of the Town of Georgetown, it is necessary to keep the road or any portion of the road open to travel during the construction, the Contractor shall carry on his work in such a manner as to provide such means that travel will not be obstructed or endangered.
- C. The Contractor shall provide and maintain in an acceptable condition such temporary roadways and bridges as may be necessary to accommodate the traffic using or diverted from a roadway where construction is taking place. He shall also provide and maintain in a safe condition temporary approaches to and crossings of intersecting roadways.
- D. Fire hydrants on or adjacent to the work shall be kept accessible to fire apparatus at all times, and no obstructions shall be placed within 15 feet of hydrant. Work areas

closed down for any length of time shall be left entirely accessible at all points to fire apparatus.

- E. Gutters and storm drain inlets shall be kept unobstructed at all times.
- F. The Contractor shall not disturb the surface of an existing sidewalk or road further in advance of the new construction that can be completed in a reasonable length of time as determined by the Engineer.

34. BARRICADES, DANGER, WARNING, AND DETOUR SIGNS

- A. The Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient lights, danger signals and signs provide a sufficient number of watchmen and take all necessary precautions for the protection of the work and safety of the public. Highways closed to vehicular and pedestrian traffic shall be protected by effective barricades, on which shall be placed acceptable warning signs. The Contractor shall detour vehicular and pedestrian traffic and shall furnish and maintain all detour signs required to direct vehicular and pedestrian traffic over the entire route of the detour. Costs for maintaining traffic shall become incidental to the bid terms of this Contract and will not be paid for directly. At all times, the Contractor shall use every precaution possible to warn pedestrians and the traveling public as to the construction in progress.
- B. Vehicular and pedestrian traffic may be detoured only over approved routes along existing roads upon vehicular and pedestrian approval of the State Highway Administration, Owner and Engineer.

35. CONTRACTOR'S RESPONSIBILITY FOR WORK

- A. Until the final acceptance of all the work as indicated in writing by the Town of Georgetown, the work shall be under the charge of and care of the Contractor. He shall take every precaution against destruction, injury, or damage to the work, or to any part thereof from any other cause whatsoever. The Contractor shall rebuild, repair, restore, and make good, at his own expense, all destruction, injuries, or damage to the work or any of the above causes before its final completion and acceptance shall be indicated in writing by the Town of Georgetown.
- B. No inspection or supervision, no failure to inspect or supervise, nor the presence of any employees of the Owner during the execution of the work, and no approval or

acceptance of any part of the work herein contracted for, or of the materials and equipment used therein, shall relieve the Contractor of any of his obligations to fulfill his Contract, or shall prevent the rejection of said work, materials, and equipment in whole or in part, at any time thereafter should said work, materials or equipment be found by the Engineer to be defective or not in accordance with the requirements of these Contract Documents.

36. USE OF A SECTION OF THE WORK

Whenever, in the opinion of the Engineer, a portion of the work is in acceptable condition for Owner's use, it may be used for its intended purpose; and such use shall not imply final acceptance of that portion of the work, nor waive any provisions of these Contract Documents.

37. TEST OF SAMPLES OF MATERIALS

Tests of materials shall be made at the Contractor's expense, by a certified testing laboratory, in accordance with the officially approved methods as described or designated. The Owner reserves the right to conduct verification testing at his own expense. The Contractor shall cooperate with and assist the Owner in conducting such testing and in taking samples and packing them for shipment to a laboratory.

38. QUALITY OF MATERIALS AND WORKMANSHIP

- A. Materials and workmanship shall be of best possible quality and feasibility for the intended purpose, whether or not a brand name is specified. Materials shall be new and unused.
- B. Representative preliminary samples of materials may be requested by the Engineer for examination or testing, or both. Materials, for which samples are submitted to Engineer, shall not be ordered by Contractor until Engineer furnishes written approval of said samples. Materials may be further inspected by the Engineer during preparation and construction of the work; and materials found to be substandard will be rejected.
- C. Contractor shall submit to Engineer samples of alternate materials that require laboratory testing. Such materials shall not be incorporated into the work until Engineer states, in writing, that materials meet requirements of the specifications.

39. AUTHORITY OF ENGINEER

- A. The Engineer shall, in all cases, determine the amount or quantity, quality and acceptability of the work and materials for which payment is made under this Contract. He shall decide on all questions in relation to said work and the performance thereof. He shall, in all cases, decide on questions which arise relative to the fulfillment of the contract, to the Contract and to the obligations of the Contract thereunder.
- B. To prevent disputes and litigations, the Engineer will be the referee in questions between the Contractor and the Owner concerning the Contract. Engineer's determination, decision, and/or estimate shall be final and conclusive upon the Contractor and shall also be a condition precedent to the right of the Contractor to receive monies under the Contract.

40. AUTHORITY AND DUTIES OF RESIDENT PROJECT REPRESENTATIVE

Resident Project Representatives (RPRs) employed by the Owner or Engineer shall be authorized to observe all work done and materials furnished. Such observation may extend to all or any part of the work and to the preparation or manufacture of the materials to be used. An RPR may be stationed on the work to report to the Engineer as to the progress of the work and the manner in which it is being performed; also to report whenever it appears that the materials furnished and work performed by the Contractor fail to fulfill the requirements of the specifications and Contract. No inspection, or any failure to inspect, at any time or place, however, shall relieve the Contractor from his obligation to perform all the work strictly in accordance with the requirements of the specifications. The RPR shall perform such other duties as are assigned to him. He shall not be authorized to revoke, alter, enlarge, relax or release any requirements of these specifications, nor to approve or accept any portion of work, nor to issue instruction contrary to the drawings and specifications. The RPR shall in no case act as foreman or perform other duties for the Contractor, nor interfere with the management of the work by the latter.

41. INSPECTION OF MATERIALS AND WORK

The Contractor shall furnish the Engineer with every reasonable facility for ascertaining whether or not the work as performed is in accordance with the requirements and intent of the specifications and Contract. If the Engineer requests it, the Contractor, at any time before acceptance of the work, shall remove and/or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the

standard required by the specifications without additional compensation. Should the work thus exposed or examined proved unacceptable, the removing, replacing and/or making good the parts removed shall be the Contractor's expense.

42. DEFECTIVE MATERIALS AND WORK

All materials not conforming to the requirements of these specifications shall be considered as defective, and all such materials whether in place or not, shall be rejected and shall be removed immediately from the work unless otherwise permitted. No materials which have been rejected, the defects of which have been corrected or removed, shall be used until approval has been given. All work which has been rejected or condemned shall be remedied, or if necessary, removed and replaced in an acceptable manner by the Contractor at his own expense.

43. FAILURE TO REMOVE AND RENEW DEFECTIVE MATERIALS AND WORK

Should the Contractor fail or refuse to remove and renew defective materials used or work performed previously or to make any necessary repairs in an acceptable manner, and in accordance with the requirements of these specifications, within the time indicated in writing, the Engineer shall have the authority to cause the unacceptable or defective materials or work to be removed and renewed or such repairs to be made at the Contractor's expense. Expenses incurred by the Owner in making these removals, renewals, or repairs, which the Contractor has failed or refused to make, shall be paid out of any monies due or which may become due the Contractor, or may be charged against the "Performance Bond" deposited. Continued failure or refusal on the part of the Contractor to make any or necessary repairs, removals and renewals promptly fully and in an acceptable manner, shall be sufficient cause for the Owner to declare the Contract forfeited, in which case the Owner, at his option, may purchase tools, materials and equipment and employ labor, as may be required to perform the work. All costs and expenses incurred thereby shall be charged against the "Performance Bond" deposited. The performance of work by the Owner and/or others as specified shall not relieve the Contractor in any way from his responsibilities under this Contract.

44. TEMPORARY SUSPENSION OF WORK

The Town of Georgetown shall have the authority to suspend the work, wholly or in part, for such period or periods as he may deem necessary, due to unsuitable weather, or such other conditions as are considered unfavorable for the suitable execution of the work, or for such time as is necessary due to the failure on the part of the Contractor to carry out orders given or

perform any or all provisions of the Contract. If it should become necessary to stop work for an indefinite period, the Contractor shall store all materials in such manner that they will not obstruct or impede the traveling public unnecessarily nor become damaged in any way, and he shall take every precaution to prevent destruction, damage or deterioration of the work performed, provide suitable drainage by opening ditches, shoulder drains, etc., and erect temporary structures where necessary. The Contractor shall not suspend the work without authorization. Neither the failure of the Engineer to notify the Contractor to suspend the work on account of bad weather or other unfavorable conditions, nor permission by the Engineer to continue work during bad weather or other unfavorable conditions, shall be a cause for the acceptance of any work which does not comply in every respect with the Contract and specifications.

45. ANNULMENT OF CONTRACT

A. Contract may be annulled if Contractor defaults in any or all of the following ways:

1. Failure to begin work at time specified.
2. Failure to perform the work with sufficient number of workers.
3. Failure to provide sufficient materials to insure prompt completion of the work, except where extension of time is granted.
4. Failure to perform the work suitably.
5. Failure to remove materials of rejected work.
6. Failure to correct rejected work.
7. Failure to execute the work in manner acceptable to Engineer.
8. Becoming bankrupt or insolvent, or both.
9. Allowing a final judgment against him unsatisfied for 48 hours.
10. Making an assignment for the benefit of creditors.
11. Failure to pay subcontractors for labor.
12. Failure to pay for materials supplied.
13. Persistently disregarding laws, rules, ordinances, regulations, and codes applicable to the work.
14. Disregarding Engineer's instructions.
15. Failure to comply, within 10 days after Contractor's receipt (by certified mail, with return receipt requested) of Engineer's notice of default and Engineer's orders to properly execute the work.
16. Lapse of Contractor's insurance.
17. Failure to discharge persons per General Condition No. 32.

- B. Engineer may act to annul the Contract, because of any or all of Contractor's defaults, in the following manner:
 - 1. Give written notice to Contractor and/or his Surety of details of Contractor's default.
 - 2. Issue certificate to Owner describing Contractor's default.
- C. Owner, upon receipt of such certificate (preceding paragraph), has full power and authority to terminate Contractor's employment and to take possession of the premises; materials, appliances and equipment of the work on the premises. Certificate shall further empower Owner to enter into an agreement for completion of said Contract according to the terms and provisions thereof, or to utilize other methods shall be deemed expedient for completion of the Contract in accordance with the drawings and specifications.
- D. The Owner shall have the right to take the following actions because of any or all of the defaults hereinbefore described:
 - 1. Withhold without paying interest, such sums of money due Contractor until Owner's claims have been protected.
 - 2. Deduct monies due the Contractor equal to amount required to pay Owner's expenses for Owner's completing the work of the Contract.
 - 3. Pay the defaulted Contractor an amount equal to the difference between actual cost of Owner's completing the Contract and the sum which would have been paid Contractor had he not defaulted, if the cost to complete the work is less than amount owed the defaulted Contractor.
 - 4. Collect from the defaulted Contractor and/or Surety an amount equal to the difference between actual cost of Owner's completing the Contract and the sum which would have been paid the Contractor had he not defaulted, if the cost to complete the work is more than the amount owed the defaulted Contractor.

46. PAYMENT FOR MATERIALS WHEN PAYMENT IS NOT MADE BY CONTRACTOR

- A. When persons furnishing labor or material, or both submit notice of completion and conditional acceptance of work, 10 days after such completion and conditional acceptance, Contractor shall furnish the Engineer evidence that payment has been made for such labor and material. If such evidence is not produced, amounts of claims

may be retained from monies due the Contractor until claims are satisfied or until notices are withdrawn.

- B. The Owner or the Engineer may also, with the written consent of the Contractor, use monies retained or due the Contractor to pay labor and material costs for the work, provided claims have been filed in the office of the Engineer.

47. NO ESTOPPEL OR WAIVER OF LEGAL RIGHTS

The Owner or the Engineer, shall not be precluded or estopped by any measurement, estimate or certificate, made or given by him, or by any agent or employee of the Owner, under any provision or provisions of the Contract, at any time, either before or after the completion and acceptance of the work and payment therefore pursuant to any measurement, estimate or certificate, from showing the true and correct amount and character of the work performed and materials furnished by the Contractor or from showing at any time that any measurement, estimate, or certificate is untrue or incorrectly made in any particular, or that the work or materials or any part thereof do not conform in fact to specifications and Contract, and the Engineer shall have the right to reject the whole or any part of the aforesaid work or materials, should the said measurement, estimate, certificate or payment be found or be known to be inconsistent with the terms of the Contract, or otherwise improperly given, and the Owner shall not be precluded and estopped, notwithstanding any such measurement, estimate, certificate and payment in accordance therewith from demanding and recovering from the Contractor and his Surety such damages as it may be sustained by reason for his failure to comply with the terms of the specifications and Contract. Neither the acceptance by the Owner, or the Engineer, or any agent or employee of the Owner nor any certificate by the Owner for payment of money, nor any payment for, nor acceptance or use of the whole or any part of the work by the Owner, or the Engineer nor any extension of time, nor any possession taken by the Owner or its employees, shall operate as a waiver of any breach of the Contract be held to be a waiver of any other of subsequent breach.

48. CLAIMS FOR EXTRA COMPENSATION

- A. Should the Contractor be of the opinion, at any time or times, that he is entitled to any additional compensation whatsoever (over and above the compensation stipulated in these Contract Documents or for quantities and/or amounts over and above the quantities and/or amounts allowed or approved by the Engineer) for damages, losses, costs and/or expenses alleged to have been sustained, suffered, or incurred by him in connection with the project herein contemplated, he shall, in each occurrence, within 5

days after such alleged damages, losses, costs and/or expenses shall have been sustained, suffered or incurred, make a written claim therefore to the Engineer on or before the fifteenth day of the calendar month succeeding that in which damages, losses, costs and/or expenses shall have been sustained, suffered, or incurred the Contractor shall file with the Engineer a written, itemized statement and/or expenses. Unless such claims and statements shall been thus made and filed, in each such instance, the Contractor's claim for such additional compensation shall be held and taken to be invalidated, and he shall not be entitled to any compensation on account of such alleged damages, losses, costs and/or expenses.

- B. The provisions of these General Conditions shall be held and taken to constitute a condition precedent to the right of the Contractor to recover; they shall also apply to all claims by the Contractor in any way relating to the complete project, and even though the claims and/or work involved may be regarded as "outside the Contract".
- C. It is understood and agreed, however, that nothing in these General Conditions contained shall be held or taken to enlarge in any way the rights of the Contractor or the obligations of the Owner under these Contract Documents.

49. EXTRA WORK RELATING TO CONTRACT

No order for extra work, nor the doing of any work, at any time or place shall in any manner or to any extent relieve the Contractor or the Surety of his bond from any of their obligations under the Contract Documents; all extra work orders being given and all extra work being done, under and in accordance with the Contract; and to be considered a part of the same and subject, to each and every one of the terms and requirements of the Contract Documents, and fully covered by the bond furnished by the Contractor.

50. SCOPE OF PAYMENTS

The Contractor shall receive and accept the compensation, as provided in the Bid or Proposal, in full payment for furnishing all materials, labor, tools, and equipment and for performing all work contemplated and embraced under the Contract, also for all loss or damage arising out of the nature of the work, or from the action of the elements, or from any unforeseen difficulties or obstructions, which may arise or be encountered during the execution of the work, until its final acceptance by the Owner, and for all risks of every description connected with the execution of the work; also, for all expenses incurred by, or in consequence of the suspension or discontinuance of the execution of the work as herein specified, and for any actual or alleged

infringement of patent, trademark or copyright and for completing the work and the whole thereof, in an acceptable manner according to the drawings and specifications. The payment of any current or final estimate, or of any retained percentage, shall in no way or in no degree prejudice or affect the obligation of the Contractor, at his own cost and expense, to renew, or replace any defects and imperfections in the construction of the work or in the strength of or quality of materials used in or about the construction of the work under contract and its appurtenances, as well as all damage due or attributable to such defects, which defects, imperfections or damages shall be discovered on or before the final inspection and acceptance of the work, and of which defects, imperfections or damages the Engineer shall be the judge, and the said Contractor shall be liable to the Owner for failure to do so.

51. PARTIAL PAYMENT ESTIMATES

- A. The Contractor may make monthly estimates in the approved format, once each month, of the materials in place complete, and the amount of work performed in accordance with the Contract, during the preceding month or period, and the value thereof figured at the unit price of the Contract. In the case of lump sum items, the estimate will be on the basis of the schedule of values to be agreed upon, as hereinafter provided for. Partial Payment Estimates (PPEs) shall be submitted in 3 original copies to the Engineer on an approved form. Contractor shall attach a schedule of values, showing percent completion, to each Partial Payment Estimate. The Engineer shall respond within 10 days and state his approval or request revisions. The Owner shall pay the Contractor the approved amount within 30 days of presentation to him of an approved partial or final payment estimate. Payment estimates are considered "approved" when signed off by the Engineer, the Owner, and the Contractor.
- B. From the total of the amounts estimated will be deducted a retainage. The retainage shall not be less than an amount equal to ten percent (10%) of an approved Partial Payment Estimate until 50 percent (50%) of the work has been completed. If the job is proceeding satisfactorily at fifty percent (50%) completion, further partial payments shall be made in full; however, previously retained amounts shall not be paid until the construction is substantially completed.
- C. A schedule of values of the various parts of the work to be done under lump sum items, shall be agreed upon by the Contractor and the Engineer. Prior to the first monthly payment requisition, the Contractor shall submit for approval, a proposed breakdown into construction categories of his lump sum bid price. This breakdown shall add up to the full 100 percent (100%) value of his lump sum price, and all parts of

it shall be covered by the Performance Bond. The approved breakdown shall be used for the purpose of arriving at a basis for monthly estimates.

- D. One half the Mobilization will be paid to the Contractor at the time of first partial payment. The remainder will be proportioned according to work completed and paid as work progresses. Mobilization shall not exceed five percent (5%) of the base price bid.
- E. Each request for partial payment shall contain Contractor's certification that he has paid all subcontractors and materials men in the same proportion for all work and materials supplied by them at his own receipts.
- F. The Contractor will be compensated monthly only for the materials in-place complete and will not be compensated for materials stored. In the case of lump sum items, monthly compensation will be on the basis of the schedule of values to be agreed upon prior to beginning construction.
- G. Prior to final payment, the Contractor shall furnish a complete release of liens form individually executed by all subcontractors and material men.

52. PAYMENTS MAY BE WITHHELD

Payments may at any time be withheld if the work is not proceeding in accordance with the Contract, or if, in the judgment of the Engineer, the Contractor is not complying with the requirements of the Contract Documents.

53. CONDITIONAL ACCEPTANCE OR SUBSTANTIAL COMPLETION

Whenever, in the opinion of the Engineer, the Contractor shall have the work substantially complete and in an acceptable manner in accordance with the terms of the Contract, the Contractor shall arrange for an inspection of the entire work by the Engineer, and upon completion of all repairs or renewals which may appear at the time to be necessary, in the judgment of the Engineer, he shall certify to the Owner in writing as to said acceptance. The aforesaid certificate shall be held and taken to evidence the conditional acceptance of the work completed by the Contractor as of the date thereof. The Owner shall continue to reserve and retain five percentum (5%) of the whole value of the work as shown by the said certificate of conditional acceptance, over and above any and all other reservations and/or deductions which the Owner is, by the terms of the Contract Documents or otherwise, entitled or required to

make and retain, and shall hold the said five percentum (5%) for a period of 1 month from and after the date of such certificate of conditional acceptance. The Owner shall be authorized to apply the whole or any part of said five percentum (5%) so retained, to any and all costs of repairs and renewals of the work and appurtenances which may become necessary, in the judgment of the Engineer, during such period of 1 month on account of any failure or defects in said work and appurtenances if due to improper work done or materials furnished by the Contractor, and if the Contractor shall fail to make or initiate such repairs or renewals within 24 hours after receiving notice from the Owner to do so. The time of project completion shall apply to Contractor obtaining "Conditional Acceptance" of all work completed involved in Contract.

54. UNLIMITED LIABILITY OF CONTRACTOR

It is understood and agreed that any and all of the duties, liabilities and/or obligations imposed upon or assumed by the Contractor and the Surety, or either of them, by or under the Contract Documents, shall be taken and construed to be cumulative, and that the mention of any specific duty, liability or obligation imposed upon or assumed by the Contractor and/or Surety under the Contract Documents shall not be taken or construed as a limitation or restriction upon any or all of the other duties, liabilities and/or obligations imposed upon or assumed by the Contractor and/or Surety by or under the Contract Documents.

55. CUMULATIVE REMEDIES

All remedies provided in the Contract Documents shall be taken and construed to be cumulative; that is, in addition to any and all other remedies provided therein and to any remedies in law or equity which the Owner would have in any case.

56. FAILURE TO COMPLETE WORK ON TIME

Permitting the Contractor to continue and finish the work or any part of it after the time established in the Contract for its completion or after the date of which the time for completion may have been extended shall not operate as a waiver by the Owner of any of its right under this Contract, and shall not relieve the Surety from its obligation.

57. PROJECT MEETINGS

A. The Engineer may keep minutes of project meetings and will distribute copies to all parties present at meeting or listed on a permanent list of concerned parties.

- B. Except as noted below for Pre-construction Meeting, Progress Meetings will be scheduled on a regular basis by the Engineer.
- C. The Engineer may call additional Progress Meetings at critical times in the project.
- D. The Contractor shall schedule the presence of active and critical suppliers, subcontractors, and management personnel at these meetings.
- E. Representatives of the Contractor's suppliers and subcontractors shall be persons familiar with the details of the work. They shall be persons authorized to make commitments on matters of work progress, delivery dates, size of labor force, cost and other matters as necessary to expedite the work.
- F. To the maximum extent practical, meetings will be held at the job site or the Wastewater Treatment Plant.
- G. A Pre-construction Meeting will be scheduled within 10 days after the Owner has issued the Notice to Proceed order.
- H. Contractor shall provide attendance by authorized representatives of the Contractor and all major subcontractors.

58. GUARANTEE BOND

- A. Prior to final payment, the Contractor's will be required to furnish the Owner with a 1 year Guarantee Certificate and a Guarantee Bond in the amount of one hundred percent (100%) of the total bid. The bond must be effective for the 1 year guarantee period beginning on the date of final acceptance by the Owner.
- B. It is understood and agreed that in the event the Contractor fails to correct, or repair any work under the Contract which may be found to be improper or imperfect, or otherwise fails to fulfill the terms of the Guarantee, the Owner may purchase materials, tools, and equipment, and employ labor, or let a Contract as required to perform the necessary corrective work covered in the Guarantee. All cost and expenses incurred thereby by the Owner shall be charged against the Guarantee Bond.
- C. An extension of the Performance Bond for the guarantee period in lieu of the Guarantee

Bond is acceptable with the proper documentation from the Surety.

59. STORAGE OF MATERIALS

Materials shall be stored so as to insure the preservation of their quality and fitness for the work. When considered necessary, they shall be placed on wooden platforms or other hard clean surfaces, and not on the ground, and shall be placed under cover when directed. Stored materials shall be located so as to facilitate prompt inspection. Lawns, grass plots, or other private property shall not be used for storage purposes without written permission of the owner or lessee.

60. NOTIFICATION OF WORK REQUIRED

- A. Inspection will be conducted by the Engineer on a full time basis for certain items of work performed below grade and above grade.
- B. The Contractor is responsible to notify the Engineer at least 48 hours prior to performing certain phases of work so that the Engineer can make available the Resident Project Representative.

These items of work include all work that is below grade or will be concealed, testing, etc., and other items of work identified in writing to the Contractor. Contractor shall not proceed with these phases of work until providing proper notice unless directed to proceed in writing by the Engineer.

- C. Failure of the Contractor to properly notify the Engineer before proceeding with work specified shall constitute grounds for non-acceptance of the work or uncovering buried work for inspection by the Engineer or RPR and subsequent testing, backfill and restoration. All such costs will be borne by the Contractor. Backfill and restoration shall be in accordance with the specifications and plans.
- D. The Contractor shall not be entitled to additional compensation or the extensions for delays caused by the Engineer or RPR as a result of improper notification by the Contractor.
- E. Notification shall be by phone call to the Engineer between 8:00 A.M. and 5:00 P.M. Monday through Friday, except holidays. Contractor to confirm that Engineer receives notification within allotted time frame if notification is made via second party or fax.

- F. Failure of the Engineer to provide an RPR during the specified phases of work in no way relieves the Contractor of his responsibilities to meet fully the specifications and requirements of this Contract.

61. EXTRA WORK

The Contractor shall perform extra work, for which there is no quantity and price included in the Contract, whenever to complete fully the work contemplated it is deemed necessary or desirable, by written authority of the Engineer, and such work shall be done in accordance with the specifications therefore or in the best workmanlike manner as directed. This extra work will be paid for at the unit price in the bid, or if no unit price is in the bid, at a lump sum to be agreed upon previously, in writing, by the Contractor and the Engineer, or, where the lump sum method of payment is impractical, the Engineer may order the Contractor to do such work on a "Force Account" basis.

62. GUARANTEE

The Contractor hereby guarantees all of the work performed under this Contract for a period of 1 year, unless otherwise noted, after final acceptance by the Owner and the Engineer. The guarantee shall be as follows:

- A. Against all faulty or imperfect materials and against all imperfect, careless and/or unskilled workmanship, as evidenced by, improperly compacted backfill, cracked sidewalks, curbs and pavements, failure of structures, etc.
- B. The Contractor agrees to replace with proper workmanship and materials, and to correct or repair, without cost to the Owner, any work which may be found to be improper or imperfect.
- C. The guarantee obligations assumed by the Contractor under these Contract Documents shall not be held or taken to be in any way impaired because of the specifications, indication or approval by or on behalf of the Owner of any articles, materials, means, combinations or things used or to be used in the construction, performance and completion of the work, or any part thereof.
- D. No use or acceptance by the Owner of the work or any part thereof, nor any failure to use the same, nor any repairs, adjustments, replacements or corrections made by the Owner due to the Contractor's failure to comply with any of his obligations under the

Contract Documents, shall impair in any way the guarantee obligations assumed by the Contractor under these Contract Documents.

63. MAINTENANCE, REPAIRS, ETC., AFTER COMPLETION

The Contractor, entirely at his own cost and expense, shall maintain all portions of the work included in this Contract to meet the requirements of these specifications for and during the period 1 month from and after the date of the conditional acceptance of the entire work by the Owner, and, in addition, shall at his entire cost and expense, make all repairs and replacements ordered by the Engineer, at any time or times, during said 1 month period, on account of any failures or defects in said work, equipment, controls and appurtenances due to improper work done or materials furnished by the Contractor.

64. EXTENSION OF TIME

- A. If the Contractor finds that it will be impossible for him to complete the work on or before the completion date fixed on the Contract, he shall, 10 days prior to said date, submit a written request to the Engineer for an extension of time for completion of the Contract. He shall set forth fully therein the reasons which he believes would justify the Engineer to grant his request, and shall set forth a revised detailed progress schedule which shall provide that the remaining work shall be completed on or before the extended completion date therein requested. If the Engineer finds that the work was delayed on account of unusual conditions beyond the control of the Contractor, or that the quantities of work done or to be done are sufficiently in excess of the estimated quantities to warrant additional time, he will, with or without notice to the Surety, grant an extension of time for completion to such date as appears to him to be reasonable and proper. This date shall thereafter be as binding upon the Contractor and Surety as if it appeared in the Contract originally.
- B. If any delay is caused to the Contractor by specific orders of the Engineer to stop work or by the failure of the Engineer to provide necessary instruction for carrying on the work or the Owner to provide necessary right-of-way, such delay will entitle the Contractor to an equivalent suspension of the liquidated damage. No increase in General Conditions or superintendent's costs will be allowed during the period.
- C. When the satisfactory execution and completion of the Contract requires more work or materials in greater amounts than set forth in the Contract, in a manner that impacts the critical path schedule, the Contractor shall be entitled to an extension of time.

When the Contractor is thus delayed by conditions beyond his control, the Contract time shall be extended equal to the number of calendar days he has been delayed. No increase in General Conditions or superintendent's costs will be allowed during the period.

END OF SECTION

SECTION 00120

INFORMATION FOR BIDDERS

Bids will be received by the Town of Georgetown (herein called, "Owner"), at 39 The Circle, Georgetown, Delaware 19947, at the date and time stated in the Advertisement to Bid.

Each Bid must be submitted in a sealed envelope, addressed to the Town of Georgetown, 39 The Circle, Georgetown, Delaware 19947, and plainly marked, "Project No. GRE01-03, Proposed Flow Meter – Del Tech Pump Station." Each sealed envelope containing a Bid must contain a completed Bid Form. Also, the envelope shall bear on the outside the Bidder's name, address, and license number, if applicable. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed to the Owner, "Town of Georgetown, 39 The Circle, Georgetown, Delaware 19947."

All Bids must be made on the required Bid Form. All blank spaces for Bid prices must be filled in, in ink or typewritten, and the Bid Form must be fully completed and executed when submitted. Two copies of the Bid Form and Bid Bond are required.

The Owner may waive any informalities or minor defects or reject any and all Bids. Any Bid may be withdrawn prior to the above scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be considered. No Bidder may withdraw a Bid within 90 days after the actual date of the opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder.

Should cost exceed available funds or if Bids are tied, the Owner reserves the right to proceed with 1 or more of the following:

- a. Delete all or a portion of an individual Bid Item (or Items), and award to the lowest base Bid. Bid Items will be amended by Change Order. Unit prices shall not be affected as Bid.
- b. Appropriate additional funds.
- c. Reject all Bids and repeat the Bid process in full.
- d. Negotiate prices down with the low Bidder or tied Bidders by modification of project scope.

Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid schedule by examination of the site and a review of the Plans and Specifications, including any Addenda. After Bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

The Owner shall provide to Bidders, prior to Bidding, all information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.

The Contract Documents contain the provisions required for the construction of the project. Information obtained from an officer, agent or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve the Contractor from fulfilling any of the conditions of the Contract.

A Performance Bond and a Payment Bond, each in the amount of one hundred percent (100%) of the Contract price, with a corporate surety approved by the Owner, will be required for the faithful performance of the Contract.

Attorneys-in-fact who sign Bid Bonds or Payment Bonds and Performance Bonds must file with each Bond a certified and effective dated copy of their power of attorney.

The party to whom the Contract is awarded will be required to execute the Agreement and obtain the Performance Bond Payment Bond and Certificate of Insurance within 10 calendar days from the date when Notice of Award is delivered to the Bidder. The Notice of Award shall be accompanied by the necessary Agreement and Bond forms. In case of failure of the Bidder to execute the Agreement, the Owner may consider the Bidder in default, in which case the Bid Bond accompanying the Proposal shall become the property of the Owner.

The Owner, within 10 days of receipt of acceptable Performance Bond, Payment Bond, and Agreement signed by the party to whom the Agreement was awarded, shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the Bidder may, by WRITTEN NOTICE, withdraw the signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

The Notice to Proceed shall be issued within 10 days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the 10 day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the work contemplated therein.

A conditional or qualified Bid will not be accepted. Award will be made to the lowest responsible, responsive Bidder.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout. Each Bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to its Bid.

The low Bidder shall supply the names and addresses of major material suppliers and subcontractors when required to do so by the Owner.

The Engineer is Beacon Engineering, LLC (BEACON). The Engineer's office is located in Georgetown, Delaware, and phone number is 302.864.8825.

END OF SECTION

SECTION 01002

SPECIAL CONDITIONS

1.1 TEMPORARY TRAFFIC CONTROLS

Contractor shall provide temporary traffic controls as directed by the DelDOT Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, Section 6, Temporary Traffic Control, December 2012 Revision.

1.2 EXISTING CONDITIONS

Upon execution of the Agreement and receipt of Performance Bond and Payment Bond by the Owner, the Contractor shall accept the existing conditions of the site as is and shall make no claim for additional compensation for any irregularities encountered during construction.

1.3 PERMITS

The following permits and approval letters have been obtained for this project and can be found following this section:

1. DNREC Wastewater Construction Permit

END OF SECTION

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Contract includes all work designated in the Contract Documents including the Specifications and as shown on the Drawings. In the case of a conflict between contract plans and specifications, the Contractor shall request a determination from the Engineer as to which shall govern. The Contractor shall furnish all implements, machinery, tools, equipment, material and labor necessary to the perform the work and shall furnish and do everything necessary to make the work perfect, complete, neat and finished, and the Contractor shall maintain all the work to be done under this Contract in this condition at the time the work is finally inspected.
- B. The work shall be done in full conformance with all codes, rules and regulations of the Town of Georgetown, Georgetown Hundred, Sussex County, Delaware and federal regulations pertaining to this project.
- C. The work under this contract also includes, but is not limited to the following:
 - 1. Assured continued operation of the Del Tech Pump Station.
 - 2. All accessory and incidental work necessary to complete the project and provide a fully operational and functional water meter.
 - 3. Contractor shall coordinate with and meet all installation requirements of the equipment manufacturer.

1.2 GENERAL REQUIREMENTS

- A. The Contractor shall submit a detailed schedule of work to the Owner and Engineer, clearly indicating any activities which may interfere with service. Activities so indicated shall be outlined in detail to indicate the procedure to be followed and the equipment to be used to prevent the loss of services. All such schedules and methods are subject to approval by the Engineer. The Engineer may require changes to any methods or schedules at any time as required so the existing services can be properly managed.
- B. Submit all shop drawings to Engineer within 20 days of Notice to Award. Contractor shall make every effort to assure shop drawings and equipment submittals are complete at first submission.
- C. Location of existing pipe and services are taken from the best available information and the Contractor shall test pit and contact Town Public Works Department well

in advance of all work in the vicinity of known and potential existing services to determine location and sizes.

- D. Storage of materials shall be on crates, wood cribs, or pallets to elevate them above the ground. Do not store equipment or other materials in direct contact with dirt or mud. Promptly clean any equipment or parts that may inadvertently become soiled.
- E. Once communications and staging area are secure contractor shall begin by performing all site work necessary to prepare the site for the installation and erection of the proposed improvements including test pitting, meeting with Public Works and other utility providers.

1.3 CONSTRUCTION SEQUENCE

- A. The project shall be scheduled in such a manner as to maintain continued operation of the Del Tech pump station. To do so, the Contractor shall coordinate with Public Works to install proposed 6" plug valve on the existing forcemain at the location shown. Test isolation valve where Del Tech forcemain intercepts _____ forcemain to ensure valve provides bubble tight isolation. In the event that valve is found to be inoperable, alternate provisions shall be coordinated between Contractor and Engineer on a time and materials basis, "force account" or other.
- B. Setup and connect temporary bypass pumping equipment to existing bypass connection and verify system operation. Test pit to locate and expose existing forcemain within the limit of work. Isolate forcemain from manifold by closing the aforementioned isolation valve, and drain forcemain using a DNREC approved method which prevents discharge of raw sewage onto the ground.
- C. After forcemain has been drained, cut main and install plug valve at the location shown. Restrain valve as indicated. Activate bypass pumping system and continue operation as needed until meter vault assembly has been installed and tested to be leak free.
- D. Cut and remove forcemain as necessary to install meter vault.
- E. Excavate and prepare subgrade. Place stone bedding and set meter vault. It is recommended that piping within meter vault be partially assembled to minimize period when bypass pumping is required. Pre-assembly would consist of assembly of all pipe and fittings between dresser coupling and flange adapter. Set pre-assemblies in place and install dresser couplings and flange adapter. Energize forcemain and check for leaks. Repair leaks if applicable. Terminate bypass pumping operations and return pump station to normal operation.

- F. Backfill and compact excavation and stabilize area per specification requirements.
- G. Complete electrical work required to provide power to meter and to integrate meter into the Mission SCADA system.

1.4 CONTRACTOR USE OF PREMISES

- A. The Contractor shall work to coordinate construction activities with the Public Works Department and other Contractors so that operation and maintenance will be disrupted as little as possible.

1.5 BY-PASS CONSTRUCTION OR OTHER TEMPORARY PUMPING FACILITIES

- A. The locations for by-passes, hauling, by-pass pumping and other temporary pumping facilities, if necessary, shall be approved by the Engineer who may from time to time require an alteration by the Contractor. The rate of pumping for by-passes shall be regulated by the Contractor as needed to prevent overflow or spillage. By-passes shall be maintained on a 24 hour basis if and as required including human attendance or automatic alarms.
- B. Provide additional temporary by-passes as needed to enable continuation of construction.
- C. Raw sewage bypasses shall be fitted with temporary screens to prevent carry over of large solids into small piping where applicable.
- D. The Contractor shall provide a means of redundant pumping or a back-up pump should the primary pump fail.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION

Work Included:

- A. Schedule of values – NOT USED
- B. Construction schedule
- C. Survey and layout data – NOT USED
- D. Shop drawings
- E. Certificates of compliance
- F. Samples – NOT USED
- G. Photos
- H. Records of testing
- I. Record drawing

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 ~~SCHEDULE OF VALUES – NOT USED~~

- A. ~~A schedule of values of the various parts of the work to be done under lump sum items shall be agreed upon by the Contractor and the Engineer. One week prior to the Pre-construction Meeting, the Contractor shall submit for approval a proposed breakdown into construction categories of his lump sum price bid. This breakdown shall add up to the full one hundred percent (100%) value of the lump sum price, and all parts of it shall be covered by the Performance Bond. The approved breakdown shall be used for the purpose of arriving at a basis for monthly estimates.~~

3.2 CONSTRUCTION SCHEDULE

- A. The construction schedule and chart shall be submitted to the Engineer for approval 1 week prior to the Pre-Construction Meeting. The general schedule will be discussed at

the Pre-Construction Meeting and copies made available to all interested parties. No construction shall be permitted until the construction schedule is approved.

- B. The Contractor shall develop a critical path construction schedule and chart that shows at a minimum a bar graph indicating the series of activities either separately or concurrently required to complete the project within the allotted time. The chart shall also indicate expected cash flows on a monthly basis. Room shall be provided on the chart whereby the Contractor can plot actual progress of the work against that initially proposed.
- C. The Contractor shall update the schedule on a monthly basis and submit the revised schedule to the Engineer along with the monthly Pay Requisition.

3.3 ~~SURVEY & LAYOUT DATA – NOT USED~~

- ~~A. The Contractor shall furnish the Engineer at least 5 days prior to the start of construction 2 record copies of line and grade stake out data. The furnishing of such record data, despite any action or lack thereof on the part of the Engineer relative to the data furnished, shall in no way release the Contractor from his responsibility for the completeness and accuracy of stake out work necessary for construction.~~
- ~~B. All survey and stake out work shall be done by qualified persons. The Contractor is responsible for stake out of all facilities required by this Contract within the prices bid.~~
- ~~C. Any benchmarks destroyed through or as a direct result of the Contractor's construction operations shall be replaced and/or restored at his expense with no additional cost to the Owner.~~
- ~~D. Work done by the Contractor without his having first established proper line and grade, or work done by him to incorrect line and grade, may be ordered removed and replaced at no increase in Contract price.~~

3.4 SHOP DRAWINGS

- A. The Contractor shall submit to the Engineer layout drawings for the installation and erection of the work and shop drawings for all fabricated or manufactured articles to be used in the work. The Contractor shall have 3 copies prepared for submittal to the Engineer and shall prepare what ever additional copies as may be necessary or required for his own use and/or use by equipment suppliers and subcontractors.
- B. Detailed shop drawings, shall include detailed materials lists and dimensional drawings, data, and literature for fabricated materials or equipment to be incorporated in the work. Include method for mounting for equipment and any alternations required due to removal, replacement, or repair of existing equipment. Include all specific data that may be required for ascertaining the excellence and character of the equipment and the space occupied. Shop drawings shall be submitted to the Engineer for review

for general compliance with the Contract Documents before fabrication. The Contractor shall obtain and check manufacturers shop drawings, certified prints and other pertinent data for conformance with all requirements with the Drawings and Specifications and in ample time to permit satisfactory progress of the work. After a completion of such check and verification by the Contractor, the Contractor shall sign or stamp such drawings, which stamp shall state as follows:

CHECKED BY: _____ (Contractor's Name)

SIGNED BY: _____ (Checker's Name)

- C. All data, drawings, and correspondence from subcontractors, manufacturers, or suppliers shall be routed through the Contractor. The Engineer shall review only such data and details as are transmitted to him by the Contractor. All correspondence from the Contractor to the Engineer shall refer to the appropriate section of these specifications containing the subject matter of the inquiry.
- D. The Engineer's review of layout and shop drawings will be only to verify general compliance with Contract Documents. Figure dimensions and other detail will not be checked. Any notation made on shop drawings by the Engineer shall be for the Contractor's guidance, but shall not relieve the Contractor from his responsibility to re-check, verify and resolve items so noted. The Engineer's review of shop drawings shall not relieve the Contractor from responsibility for errors or omissions thereon, whether or not called to the attention of the Contractor by the Engineer.
- E. The Contractor's attention is specifically directed to the fact that no work shall be fabricated nor equipment or materials ordered nor any construction performed prior to approval by the Engineer of shop drawings applicable thereto. Construction performed in violation of this requirement will be neither approved nor certified for payment until applicable shop drawings have been submitted and approved. If any equipment or materials are ordered by the Contractor prior to submission and approval of shop drawings, he does so at his own risk.
- F. The Engineer shall review at no charge shop drawings originally submitted and 1 resubmittal. Additional reviews resulting from improper submittal, lack of requested information, or disapproval shall be billed to the Contractor by the Engineer. The Contractor shall notify the Engineer in writing at the time of submission of any deviation in submittals from the requirements of the Contract Documents.

3.5 CERTIFICATES OF COMPLIANCE

Any certificates required for demonstrating proof of compliance of materials with Specifications requirements shall be executed in 3 copies plus the number to be returned to the Contractor. Each certificate shall be signed by an authorized officer of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory

test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed of relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

3.6 ~~SAMPLES – NOT USED~~

- ~~A. The number and type of samples submitted shall be specified in the particular section to which they apply.~~
- ~~B. Samples shall be physical samples to illustrate the materials and workmanship. They shall be submitted in sufficient size and quantity to clearly illustrate the functional characteristics of the product or material, with integrally related parts and attachment devices, and the full range of color to be provided.~~
- ~~C. All samples shall have been checked by and stamped with the approval of the Contractor, identified clearly as to material, manufacturer, and any pertinent catalog numbers indicating the intended use.~~

3.7 CONSTRUCTION PHOTOGRAPHS

- A. Photographs shall be taken at each of the following stages of construction:
 - 1. Before commencement of construction.
 - 2. At one month intervals during construction of the facilities. Photographs of any month need only show the new work for that month.
 - 3. Upon completion of construction.
- B. The number of photographs required at each monthly interval will be determined by the need to show all work adequately.
- C. Photographs shall be color, glossy, and 3" x 5". All photographs shall be identified on the back by date and location. Two sets of photographs shall be delivered to the Engineer as soon as possible after they are taken. All photographs shall be mounted in plastic pages with four 3" x 5" photo pockets per page. Provide 2 3-ring binders for organization of photographs.
- D. The Contractor shall deliver to the Engineer 2 each of (4) 8" x 10" color photographs representing 4 different views selected by the Owner or Engineer. The Owner or Engineer will select photographs for enlargement from the monthly set of interior and exterior photographs supplied by the Contractor. The Contractor shall therefore maintain and catalog photograph negatives for later use in enlargements.
- E. The photographs shall be clear and of high quality resolution.
- F. Should the Contractor fail to deliver photographs on schedule, the Owner will hire the

photograph work and deduct the cost from payments due to the Contractor.

3.8 RECORDS OF TESTING

- A. The Contractor shall maintain records of all testing performed during the life of the project.
- B. Records shall indicate the line, date of testing, persons involved in the testing and the results.
- C. At the end of the project, or more frequently if requested, all testing records shall be turned over to the Engineer.

3.9 RECORD DRAWINGS

The Contractor shall keep 1 copy of the drawings at the site, in good order and provide mark-up to show all changes made during construction. These record drawings shall be available to the Engineer, and shall be delivered to him upon completion of the Contract. Record drawings shall contain stationing of all valves, bends, and fittings or dimensions from structures. They shall also contain all as-built elevations. See also Section 01700.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES & CONTROLS

PART 1 - GENERAL

1.1 TEMPORARY FACILITIES

- A. The Contractor shall furnish and maintain, during construction of the project, adequate facilities at the site for the use of the Owner, Engineer and himself as set forth below. Upon completion of the project, or as directed by the Engineer, the Contractor shall remove all such temporary structures and facilities from the site, same to become his property and leave the premises in the condition required by the Contract.
- B. The Contractor and his subcontractors may maintain temporary facilities on the site in addition to those specified as may be necessary for the proper conduct of the work. These shall be located so as to cause no interference to any Contract work.
- C. The Contractor is ultimately responsible for ensuring that his forces do not interrupt the flow of daily traffic, business, or other activities of private citizens with respect to those properties directly affected by improvements made. Contractor shall notify in writing and schedule with business owners temporary access to those businesses directly affected by improvements.

1.2 TEMPORARY SANITARY FACILITIES

- A. Construct or provide portable toilet facilities to provide natural light and ventilation, or artificial light and mechanical ventilation.
- B. Provide adequate temporary outside toilet facilities for use of persons working at site.
- C. Maintain toilets clean and in sanitary condition. Provide toilet tissue in suitable holder.
- D. Remove temporary toilets when suitable facilities are available within the building or when construction is complete.

1.3 TEMPORARY WATER SERVICE

- A. Permanent-type connections may be made by Contractor for his use if piping is returned to original condition at completion.
- B. Take positive measures to preclude cross-connections and backflow.
- C. The Owner will assume cost of water consumed for sanitary facilities if responsible care and restraint is exercised by the Contractor in its use.

1.5 EXISTING UTILITIES

- A. Prior to the closeout of the Project, the Contractor shall remove all temporary connections and return all sources to their original conditions prior to commencement of the work.

END OF SECTION

SECTION 01700

CONTRACT CLOSE-OUT

PART 1 - GENERAL

1.1 GENERAL

- A. The items listed herein shall be compiled and prepared by the Contractor prior to completion of all work and delivered to the Owner for his future use.
- B. Final payment to the Contractor will be withheld until all items listed herein are delivered to the Owner.
- C. Submit all items specified herein to the Engineer for review prior to delivery to the Owner. Make any corrections, additions, or deletions from the contents thereof as may be required by the Engineer.

1.2 RECORD DRAWINGS

- A. The Contractor shall keep on site a set of reproducible plans, a current record of all changes made during construction including changes to cuts or fills and materials. The record drawings shall show the location of all permanently concealed work not installed where indicated on the Contract Documents.
- B. Accuracy of information shall be the sole responsibility of the Contractor. Drawings shall be prepared at the same scale as the Contract Documents. Copies of the Contract Drawings may be obtained from the Engineer. Cost of reproduction and shipping shall be paid for by the Contractor.

1.3 WARRANTIES

Submit all warranties called for and specified in the Supplementary Conditions of Technical Sections of the Specifications.

1.4 RELEASE OF LIENS

Affidavits of payments of all bills related to the project, release of liens, bonding company approvals and consent of surety to final payment.

1.5 CLEAN-UP

- A. The Contractor shall, at his own expense, keep the sites of his operations clean during construction and remove all rubbish as it accumulates. Daily brush cleaning of roadway and sidewalks with on-going construction activities shall be performed. The Contractor shall remove waste materials, debris, and rubbish from site and dispose of

at legal disposal areas away from site on a daily basis.

END OF SECTION

SECTION 02221

EXCAVATION AND BACKFILL FOR PIPELINES & STRUCTURES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included in this section shall include furnishing all labor, materials, and equipment necessary for the Contractor to perform all excavation, backfilling, filling, grubbing and grading required for construction and installation of pipelines, structures and appurtenances and to perform construction of treatment plant. Excavation shall include removal of pavement, concrete, rock, earth and debris, regardless of character. Trenches and excavations shall be sheeted, shored and braced by the Contractor, as necessary to allow construction and provide safe working conditions. Additionally, the Contractor shall be responsible for maintaining a dry excavation by dewatering. He shall also locate, support and protect existing utilities and structures encountered in the work, provide traffic control where required, dispose of surplus and unsuitable excavated materials and restore backfilled areas to original condition or as required by the drawings and specifications. All backfilled and restored areas shall be maintained by the Contractor, in a proper condition, for the duration of the project.
- B. The Contractor is responsible for direct or indirect damage to existing structures, pipelines, conduits, utility poles, wires and utilities of every description in the vicinity of his work whether above or below ground, or that may be encountered in trench or structure excavation, whether or not such utilities are shown on the Drawings. This responsibility shall include the cost of protection by sheeting, bracing, hand excavation, when warranted, and the expense to repair or replace any existing facility damaged directly or indirectly by construction activities under this contract.
- C. The Contractor shall verify the location, size and elevation of all existing utilities at the various points of connection and/or crossings prior to starting any work. Any discrepancies in locations or elevations shall be brought immediately to the attention of the Engineer in order that the designs may be adjusted accordingly. Damages suffered or additional costs incurred by the Contractor as a result of his failure to conform to the requirements of this paragraph shall be the sole responsibility of the Contractor. Connections to existing utilities shall be made by the Contractor at such a time and in such a manner as the Engineer may direct, and the cost shall be included in the price bid for pipeline and structures, unless otherwise defined elsewhere in the proposal.

1.2 PROJECT CONDITIONS

- A. Contact the Town of Georgetown and Miss Utility at least 48 hours prior to beginning installations.
- B. Existing Utilities: Do not interrupt existing utilities, electrical, yard piping, etc. serving

onsite facilities or others except when permitted in writing by the Engineer and then only after acceptable temporary utility services have been provided. Provide a minimum 48 hours notice to the Engineer and receive written notice to proceed before interrupting the utility.

PART 2 - PRODUCTS

2.1 GENERAL

- A. No classification of excavated materials will be made. Excavation and trenching work shall include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the contract work, regardless of the type, character, composition, or condition thereof.
- B. Materials used for backfill and fill shall be free of clay clods, rock or gravel larger than 2 inches in any dimension and debris, waste, frozen materials, and other deleterious matter.

2.2 SUITABLE BACKFILL

All suitable materials removed from the excavation shall be used for backfill. No excavated material shall be wasted without permission of the Engineer. As material is excavated it shall be separated into suitable and unsuitable material stockpiles for reuse or disposal as the case may be.

2.3 SELECT BACKFILL

- A. Should the Contractor encounter unsuitable material during excavation, he shall remove and dispose of such material at a location approved by the Engineer. The cost of such disposal shall be included in the appropriate prices bid.
- B. Should sufficient suitable material from excavations on the project not be available for backfill, the Contractor shall furnish Select Backfill upon written approval of the Engineer. Select Backfill shall conform to DelDOT Section 209, Type G, Select Borrow. Contractor shall pay for all testing necessary for approval of the select materials including sampling, sieve analysis, Atterberg limits and classification.
- C. Payment for removal of unsuitable subgrade material and replacement with select backfill as authorized by the Engineer will be made at the unit price bid for the material placed within the payment trench width detailed on the project plans and for the length and depth approved. For structures, select backfill payment volume will be limited to an area 3'0" outside the outermost edge of the structure on all sides times the depth approved.

2.4 ARTIFICIAL FOUNDATION

Whenever directed, the Contractor shall lay pipe or place structure upon an artificial foundation which he shall construct. Artificial Foundation and pipe bedding material may consist of washed, uniformly graded mixture of uncrushed gravel free from angular edges grading size 57 conforming to DELDOT Section 813 or of concrete. All to be of the form and dimensions and placed according to the detail or manner required by the Engineer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.2 STRIPPING

- A. Remove all organic material from the roadways and building construction areas. Stockpile all suitable material for reuse as topsoil during final grading and stabilization process. Remove all unsuitable materials from the site at the end of the project.
- B. The depth of stripping shall be a minimum of 6 inches or as required by actual field conditions.

3.3 DEWATERING

- A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- C. All excavations must be kept free of water below the subgrade of the work while work is in progress. This may be accomplished by ordinary pumping methods or by well points, whichever will produce the required results. Upon removal of dewatering equipment, the Contractor shall backfill all holes and restore disturbed areas to their original condition.

- D. Dewatering for the structures and pipelines shall commence when groundwater is first encountered and shall be continued until such time as backfill has been completed. No concrete, pipe, or structure shall be laid in water, nor shall water be allowed to rise until the concrete or mortar has set at least eight (8) hours. Groundwater shall not be allowed to rise until the excavation is backfilled.
- E. The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction without prior consent of the Engineer. Water shall be disposed of in such a manner as not to be a menace to the Public Health.
- F. In the event the Contractor's dewatering operations affect any water supplies within the project area, the Contractor shall take whatever steps that are required to provide uninterrupted water service.
- G. The Contractor shall remove any siltation deposits in storm sewer systems, culverts, or drainage ditches, resulting from his dewatering or construction requirements.
- H. Contractor shall be responsible for conveyance of dewatering flows and for erosion and sediment control in conformance with local and state requirements.
- I. The cost associated with dewatering operations shall be included in the appropriate price bid. No extra compensation will be allowed.
- J. Contractor shall be responsible for obtaining well permits for dewatering and shall meet all applicable requirements. Contractor shall also obtain all necessary discharge permits as required for dewatering and for erosion and sediment control and shall comply with the requirements of all agencies having jurisdiction thereof.

3.4 VERIFICATION OF SOIL BEARING CAPACITY

The Owner shall be responsible for testing of the available soil bearing capacity below the footings of any structure. He shall arrange for such testing by an independent agency. The Owner shall pay the agency for at least (2) three foot deep penetrometer tests and subsequent bearing capacity evaluation as specified on the drawings per 1000 S.F. area, minimum one (1) per individual structure. If the required value as stated in the structural notes is not reached, the Contractor shall compact the subgrade by means of vibratory rollers or other approved method and pay and arrange for retesting until the required values are met.

3.5 EXCAVATION

- A. Excavate for structures, walls, foundations, footings, etc., to the depth and width required for construction and stripping of forms. Structural excavation shall consist of the excavation of all earth, rock, boulders, existing concrete and masonry foundations and walls, and all other materials encountered regardless of type, which the Contractor may encounter. No extra compensation will be allowed for excavation greater than 3'0"

outside the most exterior point of the structure.

- B. The sides of the excavation shall be practically plumb and shall not be sloped unless approved in writing by the Engineer. Sides shall be supported or sheeted as required to protect pavement surfaces, curbing, utilities, structures, etc., and required for safety. Safety regulations shall be as required by State safety codes and OSHA.
- C. In non-paved areas, strip gravel, surface vegetation and suitable topsoil and place in stock piles which are separated from the trench excavated materials. Topsoil shall not be used for general trench refill.
- D. Should work be stopped for any reason and any excavation is left open for an unreasonable length of time, the Contractor shall refill the excavation at his own expense if so directed by the Engineer, the Inspector or the Owner. He shall not reopen the excavation until he is ready to complete the facility. Should the Contractor refuse or fail to refill any excavation completely within forty-eight (48) hours, or immediately if it poses a safety hazard, after a proper notice has been given by the Engineer or Inspector, the Owner shall be authorized to do the work. The resulting expenses shall be deducted from monies due the Contractor.
- E. The Contractor shall complete excavation as nearly as practicable to the depths of the structure to be installed as detailed. All cavities in the bottom of the excavation shall be filled to the required level with compacted crushed stone or gravel. Unless the cavities have been made on direction of the Engineer and classified as "Excavation Below Subgrade" for unsuitable material, no extra compensation shall be due the Contractor.
- F. Excavated materials shall be graded, hauled, stored and protected as such material found suitable will be required for backfilling, or other purposes. Material classified as unsuitable shall be disposed of by the Contractor at the end of the project at a location approved by the Engineer. Hauling of excavated materials for any purpose shall not entitle the Contractor to additional compensation. Only those excavated materials designated by the Owner shall become property of the Contractor.
- G. All stockpiled materials shall be placed in such a way to prevent damage to the structures, drainage areas or private property. Excavated materials shall not be placed on private property, unless written permission is obtained from the property Owner by the Contractor.
- H. The Contractor shall remove, relocate or protect all structures including but not limited to signs, mailboxes, overhead and buried utilities and other structure in the path of work as required for construction whether shown on drawings or not. No extra compensation will be allowed for property damage, injury or loss of time due to obstructions encountered not shown on the plans.

- I. General Excavation for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.6 BACKFILL

- A. Excavated materials from the trench except topsoil shall be used for backfill, provided that, in the opinion of the Engineer, the excavated material is suitable for this purpose. Backfill material shall be free from large lumps, pavement, pieces of concrete and stones.
- B. Suitable material, as approved by the Engineer, shall be carefully deposited in the excavation by methods which will not damage or disturb the pipeline or structure, and shall be solidly tamped around the pipe or structure. Backfill material shall be placed in 6" loose layers and hand tamped until the top of pipe is covered by at least 12 inches of compacted material. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system. Above this point, backfill material shall be placed in 8" loose layers. Compaction for 8" layers shall be accomplished by mechanical tampers or other approved methods. Care shall be taken in the use of mechanical tampers not to injure or move the pipe or to cause the pipe to be supported unevenly. Each layer shall be mechanically tamped for the full trench width unless an alternative method is approved in writing by the Engineer.
- C. Every backfill layer shall be compacted to 95% of maximum density at -2 to +2% of optimum moisture content as determined by the Standard Proctor Test, ASTM D 698. Materials containing an excess of moisture shall be permitted to dry until the moisture content is within the specified range. Materials too dry shall be wetted uniformly, at the Contractor's expense, until the moisture content is in the specified range.
- D. No compacting shall be done when the material is too wet to be compacted properly. At such times, the work shall be suspended until the backfill materials have dried sufficiently to permit proper compaction or such other precautions shall be taken as may be necessary to obtain proper compaction. The Contractor is responsible for hauling, storing and drying of excavated material to be used in backfill operations within the prices bid.
- E. The Contractor shall, at his own expense, maintain all refilled excavations in proper condition. The backfilled ground surfaces shall be reshaped when necessary. If the Contractor fails to make repairs within forty-eight (48) hours after receipt of written notice from the Owner, the Owner may refill said depression wherever necessary and the cost of so doing will be retained from any monies due or to become due the Contractor under the Contract. The Contractor shall be fully responsible for any injury or damage that may result from lack of maintenance of any refilled excavation at any time prior to final acceptance.

- F. All unauthorized excavations made by the Contractor shall be immediately backfilled in accordance with the requirements of the specifications for trench backfill at the Contractor's expense.
- G. Backfill around structures with suitable materials from the excavation to the original surface grades or the finished grades shown on the plans or defined by the Engineer. If additional material is needed to fill around the structure, Select Backfill shall be furnished and placed by the Contractor at the price bid in the proposal within the limits defined herein.
- H. After completion of backfilling, all material not used shall be disposed of as approved by the Engineer, and all places on the line of the work shall be left clean and in good condition. This cleaning up shall be done by the Contractor without extra compensation. If he fails to do this work within a reasonable time after receipt of notice, it will be performed by the Owner, and the cost will be retained from the monies due the Contractor under the Contract.
- I. No backfilling will be allowed until measurements of pipe and an inspection has been performed by the Owner's representative, and until the Engineer has authorized the backfill. Any unauthorized backfill of pipelines shall be uncovered by the Contractor at his expense if required by the Engineer.
- J. No backfill shall be placed against new concrete or masonry structures until properly cured. Concrete structures shall be ordered and installed according to applicable sections of Division 3 of these specifications. Test reports must indicate that 65 percent of the required compressive strength exists. The Contractor shall exercise caution in Backfill and Compaction to prevent damage to structures.
- K. All trench excavation shall be backfilled and compacted at the end of each work day unless prior permission has been obtained from the Engineer.
- L. Place and compact bedding course on rock and other unyielding bearing surfaces and to fill unauthorized excavations. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- M. Coordinate backfilling with utilities testing.
- N. Fill voids with approved backfill materials as shoring and bracing, and sheeting is removed.
- O. Place and compact final backfill of satisfactory soil material to final subgrade.

3.7 MISCELLANEOUS EXCAVATION AND BACKFILL

- A. The Contractor shall do such miscellaneous excavation as may be necessary or directed. Such excavation shall be subject to the same conditions and requirements as specified for trench excavation.
- B. Miscellaneous Excavation shall include the digging of test pits, extra width of trench beyond the specified trench payment width made necessary by change in its alignment, or excavation for any special structures outside the trench that may not be shown on the drawings or described in the specifications, where such excavation is done at the direction of the Engineer.
- C. Test pits shall be dug by the Contractor whenever directed to determine location, depth or materials of existing utilities. The depth and size of test pits shall be such as required by the Engineer.
- D. Test pits dug which are noted on the project plans or in advance of pipe laying operations to verify utility locations or additional excavation required to use sheeting or trench boxes shall be included in the prices bid in the proposal.

3.8 EXCAVATION BELOW SUBGRADE AND GRAVEL REFILL

- A. Materials below the excavation limit for pipelines and structures (below subgrade), which in the judgment of the Engineer should be removed, shall be removed as directed. All spaces created by the removal of unsuitable material below subgrade shall be refilled and compacted with crushed stone or gravel, specified in Paragraph 2.4, "Artificial Foundation," of this section. Payment for Excavation Below Subgrade and Gravel Refill shall be made at the unit price bid only for the length, width, and depth authorized by the Engineer.
- B. Should the Contractor elect to excavate suitable material below subgrade and install stone for the purpose of securing a dry trench bottom, in lieu of dewatering by mechanical methods, no payment will be made for Excavation Below Subgrade and Gravel Refill.

3.9 MAINTENANCE OF REFILLED EXCAVATIONS

- A. The Contractor shall maintain, at his own expense, all refilled excavations and surfacing in proper condition as specified herein. All depressions appearing in the refilled excavation, stabilized base and temporary paving shall be properly refilled. If the Contractor fails to make repairs within 48 hours after receipt of written notice from the Engineer, the Owner may refill said depressions and the cost thereof shall be deducted from any monies due the Contractor. In case of emergency the Owner may refill any depressions and protect with barricades without giving previous notice to the Contractor, and the cost of so doing shall be retained from any monies due or to become due the Contractor.

- B. The Contractor shall be responsible for any injury or damage that may result from lack of maintenance of any refilled excavation at any time.

3.10 EXCAVATION FOR PIPE OR STRUCTURES IN FREEZING WEATHER

No pipe or structure shall be laid or placed upon a foundation into which frost has penetrated, nor at any time when the Engineer shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation unless all required precautions as to the minimum length of open trench and promptness of backfilling are observed.

END OF SECTION

SECTION 02710

BURIED PIPE, VALVES & FITTINGS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This work includes, but is not limited to the following:
1. Trench dewatering, excavation and backfill.
 2. Furnishing and installation of pipe, fittings, valves, and adaptors.
 3. Furnishing and installation of necessary adaptors for connection to existing mains.
 4. Furnishing and installation of ductile iron pipe where shown on the drawings.
- B. Related Work Specified:
1. Excavation and Backfill for Pipelines and Structures: Section 02221.

1.2 PERMITS AND FEES

Comply with requirements of governing jurisdiction specifications regarding permits, standard materials, construction methods, inspection, approval, etc.

1.3 SUBMITTALS (per Section 01300)

- A. Submit certification for pipe and fittings.
- B. Submit manufacturer's information describing equipment proposed for use.

1.4 JOB CONDITIONS

Existing Utilities: Locate existing underground utilities in the areas of work. Call "Miss Utility" 1-800-282-8555 and the Owner for assistance in locating existing utilities. If utilities are to remain in place, provide adequate means of protection during construction of exterior water systems.

Should uncharted or incorrectly charted piping or other utilities be encountered during work, consult Owner of utility and Engineer immediately for directions as to procedure. Repair damaged utilities that are to remain in service to the requirements of the utility Owner.

PART 2 - PRODUCTS

2.1 DUCTILE IRON PIPE AND FITTINGS

- A. Ductile iron pipe shall be manufactured in accordance with ANSI/AWWA C-151/A21.51, latest edition. Buried ductile iron pipe shall be thickness Class 50 unless otherwise noted. Where called for on the drawings, piping shall have restrained joints. Acceptable restrained joints are as follows:

1. EBAA Iron, Inc.
2. TR Flex by U.S. Pipe, Birmingham, Alabama
3. Super Lock by Clow, Oak Brook, Illinois
4. Mechanical joint with retainer glands and auto-torque screws by Standard International, Jacksonville, Florida
5. Approved equal.

Where restrained joints are not required, joints shall be mechanical or push-on joints and shall be in conformance with the applicable requirements of ANSI/AWWA C 111/A21.11, latest edition. Joints shall be assembled in accordance with the manufacturer=s recommendations.

- B. Buried pipe and fitting shall have standard external asphaltic coating approximately 1 mil thick.
- C. Buried service and exposed pipe and fittings shall have an interior epoxy coating in accordance with ANSI/AWWA C 116/A21.16.
- D. All fittings and specials shall be cast iron with mechanical joint, with a 250 psi pressure rating and marked in conformance with ANSI/AWWA C110/A21.10, latest edition. Ductile iron fittings will be an acceptable alternate. They shall be mechanical joint with a 350 psi pressure rating conforming to ANSI/AWWA C110/A21.10 and C111/A21.11. All buried service fittings shall be restrained unless otherwise noted.
- E. Exposed ductile iron pipe shall be flanged, Class 53 and be manufactured in accordance with ANSI/AWWA C115/A21.15, latest edition.
- F. All exposed fittings and specials shall be cast or ductile iron with a 250 psi pressure rating and marked in conformance with ANSI/AWWA C110/A21.10, latest edition. Wall thickness shall be equal to Class 56 ductile iron pipe. Flanges shall be Class 125 in accordance with ANSI B16.1.

2.2 WASTEWATER COMBINATION AIR VALVE

- A. This specification is intended to cover the design, manufacture, and testing of Wastewater Combination Air Valves suitable for pressures up to 150 psig.

- B. Wastewater Combination Air Valves shall be automatic float operated valves designed to exhaust large quantities of air during the filling of a piping system and close upon liquid entry. The valve shall open during draining or if a negative pressure occurs. The valve shall also release accumulated air from a piping system while the system is in operation and under pressure. The valve shall perform the functions of both Wastewater Air Release and Wastewater Air/Vacuum Valves and furnished as a single body type.
- C. Standards, Approvals and Verification. Valves shall be manufactured and tested in accordance with American Water Works Association (AWWA) Standard C512. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.
- D. Single body valves shall have full size NPT inlets and outlets equal to the nominal valve size with a 2 in. inlet on 1 in. valves. The body inlet connections shall be hexagonal for a wrench connection. The body shall have 2" NPT cleanout and 1" NPT drain connection on the side of the casting. The valve shall have three additional NPT connections for the addition of backwash accessories.
- E. Valves shall provide an extended body with a through flow area equal to the nominal size. Floats shall be unconditionally guaranteed against failure including pressure surges. The seat shall provide drop tight shut off to the full valve pressure rating.

The Wastewater Air Release Valve shall have an extended leverage mechanism with sufficient mechanical advantage so that the valve will open under full operating pressure. An adjustable threaded resilient orifice button shall be used to seal the precision discharge orifice in the cover.

- F. Single body valves shall have a full port orifice, a double guided plug, and an adjustable threaded orifice button. The 1 in. (25 mm) body shall be globe style to increase float clearance and reduce clogging. The plug shall be protected against direct water impact by an internal baffle and an extended float stem. The plug shall have a precision orifice drilled through the center stem. The float shall include a sensitivity skirt to minimize spillage.
- G. The valve body and cover shall be constructed of ASTM A126 Class B cast iron. The float, plug, guide shafts, and bushings shall be constructed of Type 316 stainless steel. Non-metallic guides and bushings are not acceptable. Resilient seats shall be Buna-N.
- H. The manufacturer shall demonstrate a minimum of (5) years experience in the manufacture of wastewater air valves. The valves shall be manufactured and tested in accordance with American Water Works Association Standard (AWWA) C512. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals. The exterior of the valve shall be coated with a universal alkyd primer. Wastewater Combination Air Valves shall be

Series 800 as manufactured by Val-Matic Valve and Manufacturing Corporation, Elmhurst, IL, USA or approved equal.

2.3 ECCENTRIC PLUG VALVE

- A. This specification covers the design, manufacture, and testing of 100% Port Eccentric Plug Valve suitable for water or wastewater service with pressures up to 250 psig. Plug Valves shall be quarter-turn, non-lubricated with resilient encapsulated plug.
- B. Plug valves shall be designed, manufactured and tested in accordance with American Water Works Association Standard ANSI/AWWA C517. All Plug Valves shall be certified Lead-Free in accordance with NSF/ANSI 372. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.
- C. Mechanical Joint valves shall fully comply with ANSI/AWWA C111/A21.11.
- D. Plug valves shall have a valve seat that is a welded overlay of 95% pure nickel applied directly to the body on a pre-machined, cast seating surface and machined to a smooth finish. Plug valves shall have shaft seals which consist of V-type packing in a fixed gland with an adjustable follower designed to prevent over compression of the packing and to meet design parameter of the packing manufacturer. Removable POP™ shims shall be provided under the follower flanges to provide for adjustment and prevent over tightening. Permanently lubricated, radial shaft bearings shall be supplied in the upper and lower bearing journals. Thrust bearings shall be provided in the upper and lower journal areas, except for threaded type which only have upper thrust bearings. Both the packing and bearings in the upper and lower journals shall be protected by a Grit-Guard™ “drip tight” Buna-N shaft seal located on the valve shaft to minimize the entrance of grit into the bearing journal and shaft seal areas.
- E. Valve bodies and covers shall be constructed of ASTM A126 Class B cast iron for working pressures up to 175 psig and ASTM A536 Grade 65-45-12 for working pressures up to 250 psig. The words “SEAT END” shall be cast on the exterior of the body seat end. Plugs shall be of one-piece construction and made of ASTM A126 Class B cast iron or ASTM A536 Grade 65-45-12 ductile iron and fully encapsulated with resilient facing per ASTM D2000-BG and ANSI/AWWA C517 requirements. Plug valves shall have radial shaft bearings constructed of self-lubricating Type 316 stainless steel. The top thrust bearing shall be Teflon. The bottom thrust bearing shall be self-lubricating Type 316 stainless steel. Cover bolts shall be corrosion resistant with zinc plating. Valve exterior for buried service shall be coated with an epoxy coating.
- F. Valves shall be equipped with a 2 inch square nut for direct quarter turn operation. The packing gland shall include a friction collar and an open position memory stop. The friction collar shall include a nylon sleeve to provide friction without exerting pressure

on the valve packing.

- G. Manufacturer shall demonstrate a minimum of ten (10) years' experience in the manufacture of plug valves. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings and operation and maintenance manuals. Valve shall be marked with the Serial Number, Manufacturer, Size, Cold Working Pressure (CWP) and the Direct and Reverse Actuator Pressure Ratings on a corrosion resistant nameplate. Plug Valves shall be Series 5700R (100% Port Mechanical Joint), as manufactured by Val-Matic Valve and Mfg. Corporation, Elmhurst, IL, USA or approved equal.

2.4 WALL SLEEVE & SEAL

- A. Furnish and install pipe sleeves wherever piping passes through walls, floors, partitions, foundations, roof or other structures.
- B. Wall sleeves above grade and not subject to hydrostatic pressure shall be finished flush at both wall faces and shall be constructed of galvanized steel pipe for lines larger than 6 inches. Sleeves for lines 4 inches and smaller may be constructed of 18 gauge soldered sheet metal and shall clear the pipe or insulation O.D. by not less than 2 inch. Wall sleeves below grade or where under hydrostatic pressure shall include center flanged water stop external to the wall sleeves at the mid-point of the wall. The pipes within the sleeves below grade and/or subject to hydrostatic pressure shall be made watertight with hydrostatic wall seal. All other pipes shall be sealed to sleeves with fiberglass and both ends sealed with waterproof caulking.
- C. Install sleeves as the building is constructed and when concrete is poured. Securely anchor sleeves to the structure with anchor lugs or flanges. Floor sleeves in wet area shall extend 2" above finished floor.
- D. Hydrostatic seal designed to seal opening between pipes and true wall opening and between carrier pipe and sleeve. Use Link-Seal by Thunderline Corp., or equal.

2.5 VALVE BOX

- A. Waterway shall be smooth and shall have no depressions nor cavities in seat area where foreign material can lodge and prevent closure or seating.
- B. Gate valves shall be manufactured by M & H, Kennedy, or equal.
- C. Provide 1/4" diameter, 3 piece, buffalo screw type valve box with "Sewer" cast in the lid. All boxes shall be equipped with #6 round base. Valve boxes shall be adjustable between 2'4" and 3'4" except when deeper settings are required. Lids shall be extra deep and have two holes for removal of lid. Valve boxes shall be as manufactured by Bingham and Taylor. Adjust top of valve boxes to grade and encase with concrete collar with reinforcement when installed in unpaved areas.

- D. One extra valve wrench shall be provided.

2.6 PVC PIPE RESTRAINT JOINT

Mechanical joint restraint shall be incorporated into the design of the follower gland. The restraint mechanism shall consist of a plurality of individually-actuated gripping surfaces to maximize restraint capability. Glands shall be manufactured of ductile iron conforming to ASTM A536-80. The gland shall be such that it can replace the standardized mechanical joint gland and can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of latest version. Twist off nuts, sized same as tee-head bolts, shall be used to insure proper actuating of restraining devices. The restraining glands shall have a pressure rating equal to that of the pipe on which it is used. The restraining glands shall have been tested to ASTM F1674-96, be listed by Underwriters Laboratories, and be approved by Factory Mutual. The restraint shall be the EBAA Iron Series 2000PV or approved equal.

2.7 DUCTILE IRON PIPE RESTRAINT JOINT

Mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism which, when actuated, imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases. Flexibility of the joint shall be maintained after burial. Glands shall be manufactured of ductile iron conforming to ASTM A-536-80. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist-off nuts shall be used to insure proper actuating of the restraining devices.

The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGALUG or approved equal.

PART 3 - EXECUTION

3.1 EXCAVATION AND BACKFILL

Trench excavation and backfill construction methods to conform with Section 02221.

3.2 INSTALLATION

- A. Lay pipe on firm base and secure uniform bedding. Provide backfill (Maximum aggregate size: 3/4 inch) as necessary to stabilize trench bottom. Slag is not an acceptable alternate for gravel.
- B. Pipe laying is not permitted in frozen ground. Keep pipe clean and tightly stopper ends when work ceases.

- C. Clean joints and lubricate slip on joints prior to making tight connection.
- D. Install fittings, valves and hydrants as indicated or required and make pipe cuts smooth and even. Valve boxes shall be set plumb and adjusted flush with finished grade.
- E. Pour concrete buttresses at fittings.
- F. Installing Fittings, Valves and Valve Boxes
 - 1. Fittings, valves and valve boxes shall be placed along the mains at the locations indicated on the drawings or where otherwise designated by the Engineer.
 - 2. A valve box shall be carefully placed over the bonnet of each valve with the top at finished grade or at such other elevation as the Engineer shall direct. It shall be set exactly plumb. In tamping the backfill around the box special care shall be taken to keep the box plumb and to have it firmly supported on two 4-inch thick solid concrete blocks so as to avoid settlement. Any box which is found out of plumb, or which is not firmly supported, shall be excavated and reset in a satisfactory manner, at the Contractor's expense. Valve boxes shall not come in contact with the valve or the watermain.

END OF SECTION

SECTION 03400

PRE-CAST STRUCTURAL CONCRETE

PART 1 - GENERAL

1.1 SCOPE OF WORK

Furnish all engineering, supervision, labor, equipment and materials to complete all pre-cast concrete construction as shown on the drawings. This shall include but not be limited to pre-cast concrete vaults. Anchorage plates, lifting devices, sheathing, couplings, gaskets, grout, sealants and all work directly related to pre-cast work shall be included. ASTM C913 Standard Specification for Pre-cast Concrete Water and Wastewater Structures.

1.2 REQUIREMENTS

- A. The manufacture of the pre-cast concrete box sections shall be in accordance with ASTM C789 Standard Specifications for Pre-cast Reinforced Concrete Box Section for Culverts, Storm Drains, and Sewers; ASTM C478 Standard Specification for Pre-cast Reinforced Concrete Manhole Sections; ASTM C913 Standard Specification for Pre-cast Concrete Water and Wastewater Structures; and in accordance with the drawings.
- B. The pre-cast manufacturer and erector must have been regularly engaged for a period of at least two years in the manufacture and erection of pre-cast concrete sections similar to the requirements of this project.
- C. Deviations to pre-cast concrete sections will be allowed upon approval by the engineer. Deviations shall be certified by a registered professional engineer.
- D. Shop drawings shall be submitted to the Engineer for approval and manufacture shall not proceed prior to receiving approval of the Engineer.
- E. All concrete work shall conform to "Building Code Requirements for Reinforced Concrete", ACI 318, latest edition.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. The following sections form a part of this section. It shall be the Contractor's responsibility to coordinate work of other sections with the work of this section to complete the work required.
 - 1. Section 02221 – Excavation and Backfill for Pipelines & Structures

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portland Cement - ASTM C-150.
- B. Aggregates - ASTM C-33.
- C. Water - Clean, fresh, free from oil, acid, organic matter, or other substances harmful to concrete and embedded steel.
- D. Reinforcing Bars - ASTM A-615.
- E. Welded Wire Fabric - ASTM A-185.
- F. Joint Sealant - ASTM C425 and ASTM 443, D-Lok by A-Lok Corporation or approved equal.
- G. Resilient Connectors wherever gravity sewer penetrates concrete - ASTM C-923, A-Lok by A-Lok Corp., or approved equal.
- H. Hydrostatic Seal wherever force main penetrates concrete - ASTM D-2000, Link-seal by Thunderline Corp., or approved equal.
- I. Grout - Grout materials shall be non-metallic, non-shrinking, high strength grout.

2.2 CONCRETE MIX

- A. Concrete shall have a minimum 28-day compressive strength of 5000 PSI.
- B. Use of calcium chloride, chloride ions, or other salts is not permitted.

2.3 MANUFACTURER

- A. Manufacturing procedures shall be in general compliance with ASTM C-478, ASTM C789, and ASTM C913.
- B. Manufacturer shall provide all openings as required and as detailed on the drawings.
- C. Manufacturer shall cast all inserts as required and as detailed on the drawings.

PART 3 - EXECUTION

3.1 ERECTION

- A. General Contractor shall be responsible for supplying and placing embedded anchorage

plates and hardware in the base slab as detailed by the pre-cast manufacturer's erection drawings.

- B. Installation of pre-cast concrete shall be performed by a competent erector. Members shall be lifted by means of suitable lifting devices at points provided by the manufacturer. Temporary shoring and bracing, if necessary, shall comply with manufacturer's recommendations.
- C. Members shall be properly aligned and leveled as required by the approved shop drawings.
- D. Contractor shall apply joint sealant system. Joint surfaces shall be clean and dry. Place butt ends of preformed sealant together. Do not overlap.
- E. The exterior surface shall be coated with a minimum two coat application of a 68 percent solids coal tar type protective coating. The total average dry film thickness shall measure 24 mils with no single measurement to be less than 20 mils. Surfaces shall be prepared in accordance with the manufacturer's instructions and coatings applied in the field or pre-casting shop in a manner acceptable to the Engineer. The coating material shall be Bitumastic Super Service Black manufactured by Koppers Co., Inc., Pittsburgh, Pennsylvania, Tar-Jet Super Black XX-32-B-22 manufactured by Pennsbury Coatings Corp., New Britain, Pennsylvania, or equal.
- F. Final inspection and acceptance of erected pre-cast concrete shall be made by the Engineer. Any work not meeting the requirements of this and/or related sections shall be corrected at no cost to the Owner.

END OF SECTION

SECTION 05170

MISCELLANEOUS METALS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This work consists of furnishing all labor, materials, and equipment for the installation of all miscellaneous steel, iron, aluminum, and other miscellaneous metal work shown, specified, and/or reasonably implied for a complete job.
- B. Concrete reinforcement is specified under Division 3 of these specifications.

1.2 SUBMITTALS

- A. Submit three copies of detailed materials listings and dimensional drawings of metal fabrications, showing joints, fastenings, finishes.
- B. Shop Drawings: Submit three copies of shop drawings as required by these specifications.

1.3 ACCEPTABLE ITEMS

Materials, products, patterns, and fabrication methods meeting the requirements of this specification and conforming to details and design indicated in the drawings will be accepted.

1.4 BUILT-IN ITEMS

Built-in items shall be installed in ample time for incorporation with the work. The Contractor shall organize coordination with the other trades in furnishing and/or installation of materials in such a manner as to expedite the progress of all work.

1.5 WORKMANSHIP

Workmanship shall be in accordance with the best practices. Work shall be performed in an approved, workmanlike manner by mechanics skilled in fabricating each of the metals being used.

1.6 SUPPLEMENTARY PARTS

Supplementary parts necessary to complete each item, though such items are not definitely shown or specified, shall be provided. Anchors, sockets, sleeves, or other fastenings required for securing metal work to other construction shall be provided. All supplementary parts shall be provided with prices bid. Measurements shall be taken as may be necessary to verify and supply dimensions or conditions shown in the drawings.

PART 2 - PRODUCTS

2.1 FINISHES

- A. Steel Items: Hot dip zinc coated at exterior and wet locations, according to ANSI G8.1, shop prime elsewhere.
- B. Iron Items: Prime coated with rust-inhibitive primer such as 99 Red Metal Primer by Tnemec, or approved equal.

2.2 STAINLESS STEEL

Stainless steel shall be Type 304 with 2B polished finish, unless otherwise indicated.

2.3 L-HOOK ANCHOR BOLTS

Fabricate of stainless steel, ASTM A320, Grade B8, AISC Type 304 unless noted otherwise, to diameter and indicated dimensions. Thread one end and provide nut with standard or special washer as shown. Cold form hook on other end. Extend 4" minimum into concrete, 18" into masonry. Use nonferrous shields. Bolts in materials less than 8" thick shall be through a steel backup plate.

2.4 SLEEVES

Sleeves will be provided by the trade involved. The prime Contractor shall bear sole responsibility to see that they are properly set and held in place.

2.5 MISCELLANEOUS PIPE SUPPORTS AND SADDLES

Miscellaneous pipe supports and saddles shall be provided as indicated or as necessary to support piping or provide restraint of pipe subject to pressure thrust.

2.6 ANCHOR BOLTS

- A. Fastening to steel members shall be done with steel. Fastening to aluminum shall be with stainless steel. Fastening steel to aluminum shall be done with stainless steel and nylon washer barrier.
- B. Anchor bolts placed into hardened concrete shall be as follows:
 - 1. For non-submerged conditions:
 - a. Hilti Kwik Bolt II expansion anchor or equal.
 - b. Hilti HY 150 adhesive anchor or equal.
 - 2. For submerged, intermittently submerged, or within 3' of submergence:

- a. Hilti HY 150 adhesive anchor or equal.
3. Expansion type shall use 304 stainless steel anchor and lead alloy shield.
4. Adhesive type shall use 304 stainless steel threaded anchor and epoxy.
5. Anchors shall extend at least 4 inches into concrete and masonry. Bolts in concrete and masonry shall have non-corroding metal shields. Bolts in material less than 8 inches thick and with a compressive strength of less than 600 psi shall be through bolts, extending through a steel backup plate that reduces unit stress upon the material to one half the allowable stresses.

2.7 ALUMINUM ACCESS HATCH (OUTDOOR USE)

- A. Halliday or approved equal, size and arrangement as shown on the drawings or as needed to accommodate the work. Access frames and covers shall have 1/4" thick, mill finish, extruded aluminum channel frame, incorporating a continuous concrete anchor. A 1 1/2" drainage coupling shall be located in the front corner of the channel frame. A bituminous coating shall be applied to the frame exterior where it will come in contact with concrete. Door panel shall be 1/4" aluminum diamond plate, reinforced to withstand an H-20 live load. Door(s) shall open to 90%E and automatically lock with a stainless steel hold open arm with an aluminum release handle. For ease of operation, the hold open arm shall incorporate an enclosed stainless steel compression spring assist located so as not to interfere with equipment removal. Door shall close flush with the frame and rest on a built-in neoprene cushion/gasket. Hinges and all fastening hardware shall be stainless steel. Unit shall lock with a stainless steel slam lock with removable key and have a non-corrosive handle. Unit shall be guaranteed against defects in material and/or workmanship for a period of 10 years.

2.8 LADDER

- A. The ladder shall be constructed of aluminum. The rails shall be 3/8" x 2-1/2" flat bar and shall be spaced 16" apart. The wall mounted standoffs shall be 3/8" x 2-1/2" flat bar and welded to the rails at a maximum of 60" on center. The standoffs shall be a minimum of 7" and manufactured to fit flush with the wall. 1-3/8" diameter slip resistant ribbed rungs shall be spaced 12" on center and shall be welded to the inside of each rail. Stainless steel ladders shall be Halliday Products Series L1D, or approved equal. All ladders shall be equipped with an OSHA approved ladder extension. Extension shall be made from metals matching ladder construction.

PART 3 - EXECUTION

3.1 FABRICATION

- A. Steel, iron, and other materials furnished under this section shall be well formed to shape and size required by drawings with all angles sharp and true with surfaces weld finishes, smooth and with well defined lines and arises. Punching and shearing shall be

properly and neatly done. Permanent connections shall be riveted, bolted, or welded as required. Curved work shall be evenly sprung in uniform curves. Joints shall be milled to produce a neat, close fit in all cases. Necessary rabbets, lugs, and brackets shall be provided so that work can be assembled in a neat and substantial manner.

- B. Fabricate in the largest possible units. Field connections shall be located at points of low stress where not visible or unsightly in such a way that full strength can be developed by field connections. For flexibility in meeting conditions, make liberal use of slotted holes and other adjustable connections.
- C. Holes shall be drilled where possible, and fasteners shall be concealed where practicable. Where possible, bolt, screw and rivet heads shall be countersunk flush. The thickness of metal and details of connection and supports shall be such as to provide adequate strength and stiffness. Exposed joints shall be formed to exclude water and make watertight wherever possible.
- D. Fastenings:
 - 1. Bolts shall extend at least 4 inches into concrete and masonry. Bolts in concrete and masonry shall have non-corroding metal shields. Bolts in material less than 8 inches thick and with a compressive strength of less than 600 psi shall be through bolts, extending through a steel backup plate that reduces unit stress upon the material to one half the allowable stress.
 - 2. Provide nuts and large diameter washers to all bolts. Nick threads in locations subject to vibration or vandalism. Countersink bolt and screw heads in exposed work.
 - 3. Hurricane clips shall be a minimum of 18 ga. Steel, and fastened as per manufacturer's recommendations. Reference drawings for type and placement.
 - 4. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Joints exposed to weather shall be formed to exclude water. Provide holes and connections for the work of other trades.
 - 5. Aluminum members shall be fastened with stainless steel fasteners with nylon barrier washers.
- E. Except where otherwise specified for a particular item of work or for built-in work, metal work shall be fastened to solid masonry with expansion bolts and to hollow block with toggle bolts. Fastening to wood plugs in masonry will not be permitted. Holes for plugs or bolts shall be drilled to the exact diameter of the plug or bolts using a rotary drill for concrete or a percussion drill for other masonry. Screws shall be threaded full length to the head of the screw.
- F. Before final acceptance of the work, all miscellaneous metal items shall be thoroughly cleaned using only mild soap and water where possible. Caustic cleaners shall not be used, and solvents shall be used only with extreme care.

G. Welds:

1. Welds shall be continuous unless otherwise indicated, sized as to fully transmit all loads, including rotational loads, and shall be made according to AWS Standards.
2. In exposed work, grind welds smooth, remove spatter and burns, bring adjoining metal finish to original condition. Fill pits.
3. At galvanized work, after grinding and filling, apply Galv-Weld with torch to restore zinc coating.
4. Welding shall be done under proper supervision and in accordance with the latest edition of "Code for Fusion Welding and Gas Cutting in Building Construction" of the American Welding Society. All welders shall be certified. All exposed welds shall be ground smooth. Prime all welds.

H. Shop paint, except as specified otherwise or shown in the drawings, shall be applied to all miscellaneous steel and iron after being cleaned thoroughly of all dirt grease, loose scales, rust, or other foreign material.

I. Anchorage or attachment of miscellaneous metal items shall be by thru-bolts, adhesive anchors, or bolts engaging lead or metal expansion shields. Self-drilling devices similar and equal to "Red Heads", rawl plugs or wood blocks shall not be used.

J. Structural design of steel items covered in these specifications shall conform to the "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction.

3.2 GALVANIZING STEEL

Unless otherwise noted, all galvanized steel shall be hot dipped galvanized. Galvanizing shall be in accordance with ASTM A124, A384, and A385 of latest revision.

END OF SECTION

SECTION 13620

MAG METER

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The contractor shall furnish all labor, materials and equipment necessary to coordinate with and assist in integration, calibration, and placement in service of the proposed flow meter. All equipment of one group shall be supplied by one manufacturer. Manufacturer shall assist contractor in placing devices in service, calibrate such devices and all related instrumentation.

1.2 SUBMITTALS (ALSO REFER TO SECTION 01300)

- A. The equipment supplier shall submit to the engineer complete sets of shop drawings, details, data sheets and other descriptive drawings and material as may be required to fully describe the equipment proposed and verify compliance with the contract documents.
- B. All submittals shall be complete, neat and orderly. The submittals shall include the following as applicable:
 - 1. Shop drawings showing interconnections of the components in the system, including wiring diagrams and installation details.
 - 2. Equipment descriptions of each piece of equipment specified.
 - 3. Description of operation and control of equipment.
 - 4. One (1) preliminary copy of operation and maintenance requirements for the overall system.
- C. Submittals which are partial or piecemeal shall be returned by the Engineer without review until submitted in accordance with the above.

PART 2 - PRODUCTS

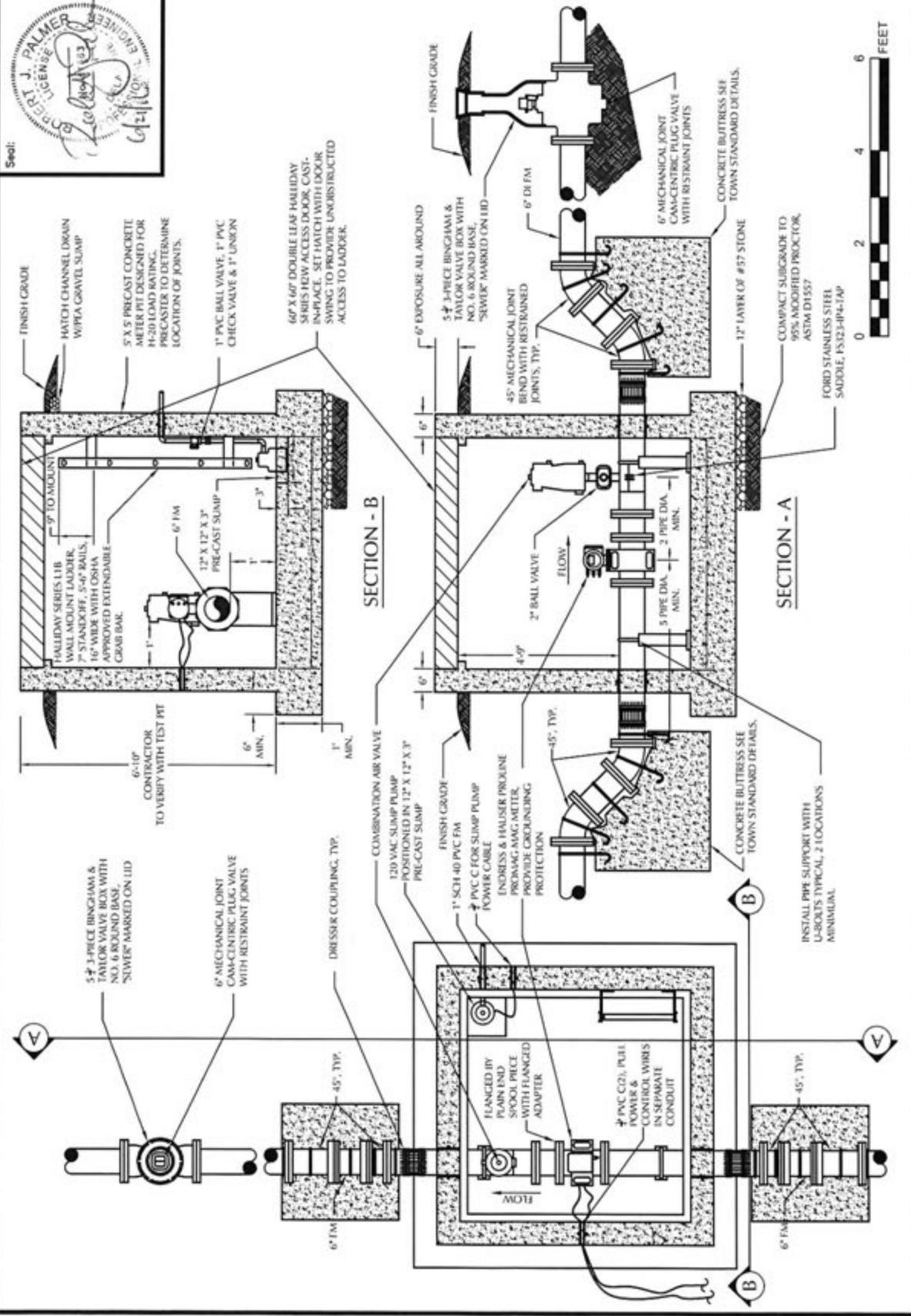
2.1 MAG METER

- A. Manufacturer and model: Endress & Hauser Promag 50WIF with grounding disc/protection disc.
- B. The electromagnetic flow meter sensor shall be provided with IP68 (Type 6P enclosure) and a modular electronic concept. Meter shall provide secure, reliable long-term operation and have a robust and completely welded sensor. There shall be no pressure loss due to cross-section construction. Sensor shall be maintenance-free and contain no moving parts.

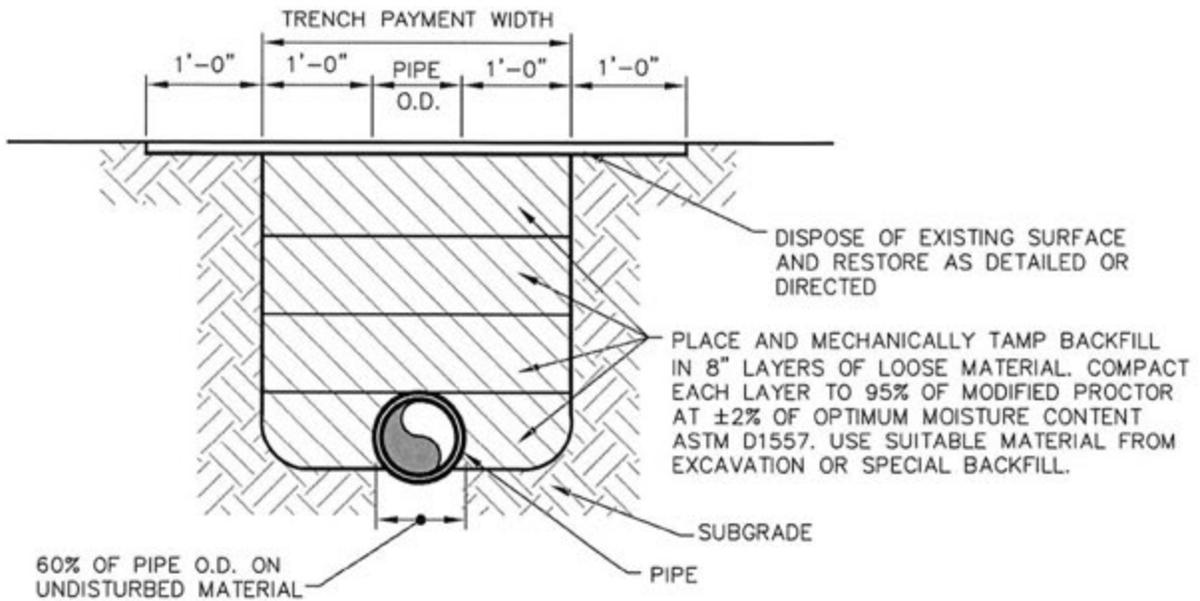
- C. Display shall provide easy readable process information. Display shall be a fully industry compliant – IEC/EN/NAMUR 2-line backlit display with push buttons. Provide remote display with sufficient cable to extend un-spliced between sensor and display.
- D. The maximum measured error shall be no greater than $\pm 0.5\%$ of full scale with a measuring range of 90-2650 gpm. Full scale current output shall be 600 gpm. Low flow rate shall be 12 gpm maximum.
- E. Unit shall provide a pulsed signal where one pulse = 100 gallons. Signal shall be a voltage free dry contact, open collector, or FET that supports a 5-volt DC signal with 100 millisecond duration.

PROPOSED FLOW METER
METER PIT PLAN, SECTION & DETAILS
TOWN OF GEORGETOWN, GEORGETOWN HUNDRED,
SUSSEX COUNTY, DELAWARE.

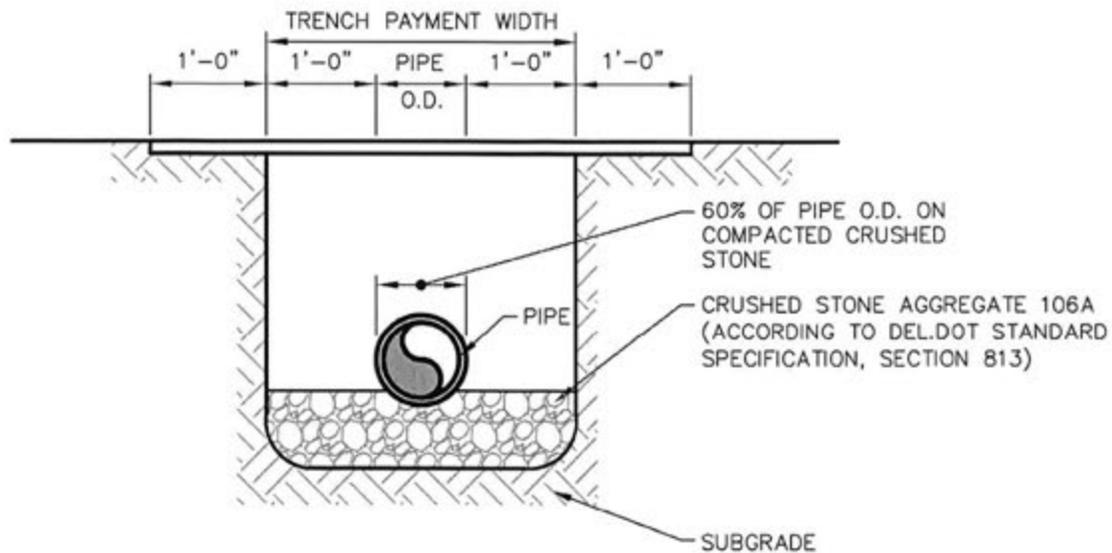
Date:	JUNE 21, 2016
Scale:	1/2" = 1'-0"
Dwn. By:	BLH
Proj. No.:	GE001-03
Dwg. No.:	SP.3



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TRENCH BACKFILL



CRUSHED STONE BEDDING

PROPOSED FLOW METER - DEL TECH PUMP STATION

DATE: AUGUST 2004

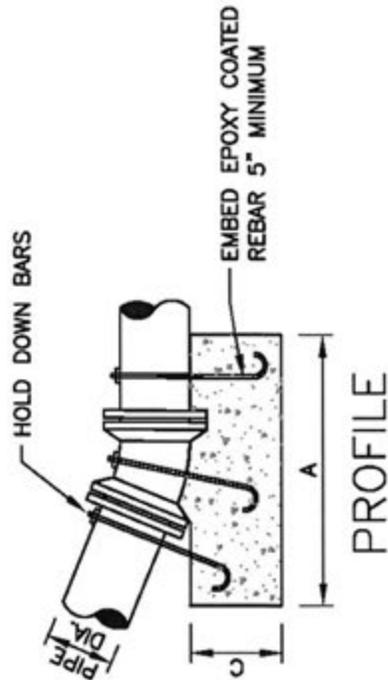
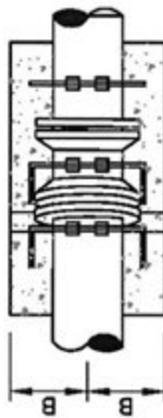
NO SCALE

CONSTRUCTION STANDARDS
TOWN OF GEORGETOWN

SECTION - 1

DRAWING: D1-1

DIMENSION SCHEDULE									
BEND		PIPE DIAMETER							
		4"	6"	8"	10"	12"	16"	24"	
11 1/4"	A	6"	6"	8"	10"	10"	1'-0"	1'-4"	2'-6"
	B	7"	7"	8"	9"	10"	1'-0"	1'-6"	
	C	7"	7"	8"	8"	9"	1'-4"		
22 1/2"	A	9"	9"	1'-0"	1'-6"	1'-9"	2'-3"	3'-0"	
	B	7"	7"	8"	8"	10"	1'-0"	1'-6"	
	C	7"	7"	8"	8"	9"	1'-4"		
45°	A	1'-3"	1'-3"	1'-8"	2'-1"	2'-6"	3'-4"	4'-2"	
	B	7"	7"	8"	9"	11"	1'-3"	2'-0"	
	C	7"	7"	8"	10"	11"	1'-3"	2'-0"	



• USE OF BAGGED CONCRETE PROHIBITED.

BAR SCHEDULE		
SIZE	REINFORCING BARS	
	11 1/4"	22 1/2"
4 & 6"	3 #6	3 #6
8"	3 #6	3 #6
10"	3 #6	3 #6
12"	3 #6	3 #6
16"	3 #6	3 #6
18"	3 #8	3 #8
20"	3 #8	3 #8
24"	3 #8	3 #8

PROPOSED FLOW METER - DEL TECH PUMP STATION

DATE: AUGUST 2004

CONSTRUCTION STANDARDS
TOWN OF GEORGETOWN

VERTICAL UPWARD BEND DETAIL

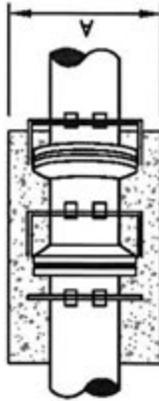
REVISED 7-11-07

NO SCALE

SECTION - 4

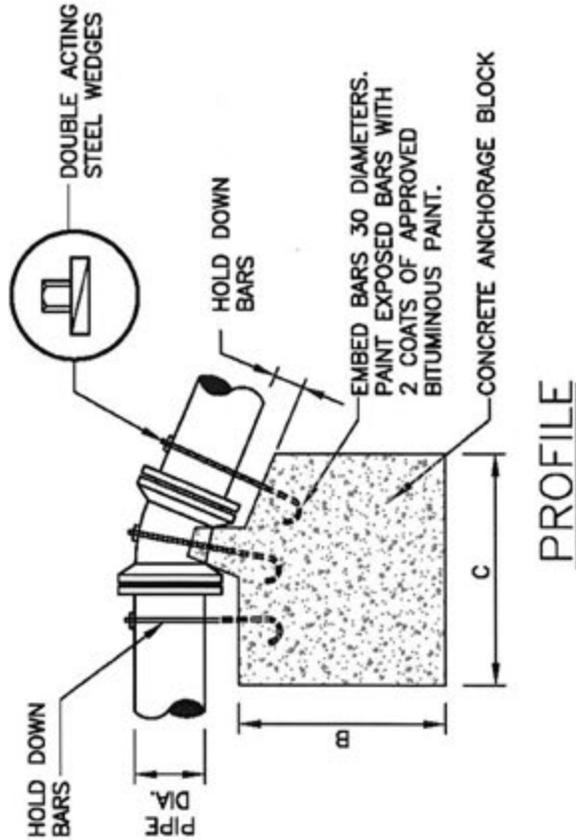
DRAWING D4-5

DIMENSION SCHEDULE										
BEND	PIPE DIAMETER									
	4"	6"	8"	10"	12"	16"	18"	20"	24"	
11 1/4	A	1'-6"	1'-6"	1'-6"	2'-5"	3'-0"	3'-4"	3'-6"	3'-9"	4'-0"
	B	1'-3"	1'-3"	1'-9"	1'-9"	2'-0"	2'-4"	2'-6"	2'-9"	3'-0"
	C	2'-0"	2'-0"	2'-6"	2'-9"	3'-0"	3'-4"	3'-6"	3'-9"	4'-0"
22 1/2	A	2'-0"	2'-0"	3'-4"	3'-8"	4'-0"	4'-4"	4'-6"	4'-9"	5'-0"
	B	1'-9"	1'-9"	2'-3"	2'-6"	2'-6"	3'-0"	3'-2"	3'-4"	3'-6"
	C	2'-6"	2'-6"	2'-8"	3'-10"	4'-0"	5'-4"	5'-6"	5'-9"	6'-0"
45	A	2'-6"	2'-6"	3'-0"	4'-0"	4'-6"	5'-0"	5'-3"	5'-6"	5'-8"
	B	2'-6"	2'-6"	2'-9"	3'-0"	3'-6"	4'-4"	4'-6"	4'-9"	5'-0"
	C	3'-0"	3'-0"	4'-0"	4'-6"	4'-9"	5'-0"	5'-3"	5'-6"	5'-8"



PLAN

* USE OF BAGGED CONCRETE PROHIBITED.



PROFILE

BAR SCHEDULE		
SIZE	REINFORCING BARS	
	11 1/4	22 1/2
4 & 6"	3 #6	3 #6
8"	3 #6	3 #6
10"	3 #6	3 #6
12"	3 #6	3 #6
16"	3 #6	3 #6
18"	3 #8	3 #8
20"	3 #8	3 #8
24"	3 #8	3 #8

PROPOSED FLOW METER - DEL TECH PUMP STATION

DATE: AUGUST 2004

CONSTRUCTION STANDARDS
TOWN OF GEORGETOWN

VERTICAL DOWNWARD BEND DETAIL
NO SCALE

SECTION - 4

DRAWING D4-6