



## **Attachment "A"**

### **Technical Specifications (Volume II)**

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## SECTION 01010

### SUMMARY OF WORK

#### PART 1 - GENERAL

##### 1.01 GENERAL

- A. The Work to be performed under this Contract shall consist of furnishing all tools, equipment, materials, supplies, and manufactured articles and for furnishing all transportation and services, including fuel, power, water, and essential communications, as well as for the performance of all labor, work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The Work shall be complete and all work, materials, and services not expressly shown or as called for in the Contract Documents shall be included in the work performed.

##### 1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Project consists of furnishing all labor, materials and equipment for performing the following Work:
1. The OWNER desires to perform a television survey for portions of their sanitary sewer system. The television survey will be used by the OWNER to generate a list of recommended sanitary sewer rehabilitation project(s). The Work will include the following work associated with the television survey:
    - a. Sanitary sewer main and lateral cleaning.
    - b. Sanitary sewer main and lateral televising.
    - c. Manhole inspection and cleaning
    - d. Sanitary sewer bypass pumping
    - e. Mechanical removal of roots and grease.
    - f. Mechanical tuberculation removal.
    - g. Smoke testing.
    - h. Flow metering.
    - i. Dye testing.
    - j. Electro Scan leak location.
    - k. All work considered to be incidental to the aforementioned tasks.
- B. Prior to construction, the CONTRACTOR shall identify existing utilities. The CONTRACTOR will be responsible for the coordination of his work with the associated

utility owner and permitting agencies having jurisdiction over the existing utilities or the associated work.

- C. The Work also includes providing temporary sanitary sewer service of service laterals bypass pumping or plugging, if needed, and other appurtenant and miscellaneous items and work for a completed project.
- D. Work shall be performed to ensure a minimum of traffic disruption or sewer down time as necessary, and work must be coordinated with affected residents and utility personnel. Whenever the property owners' use of the sanitary sewer must be interrupted by the Work, the CONTRACTOR shall notify the residents well in advance of the interruption. This notification shall be accomplished with door hanger notification cards to be placed at the addresses of affected customers. Property owners shall be informed when service interruption will take place and the approximate duration. This notice shall be provided a minimum of 24 hours in advance of commencement of service intrusion. The CONTRACTOR shall make every effort to minimize inconvenience to the public and property owners.
- E. The CONTRACTOR shall perform all work in strict accordance with all applicable OSHA Standards. Particular attention is drawn to those safety requirements involving man entry in confined spaces. Prior to entering manholes and other confined spaces the atmosphere shall be evaluated by the CONTRACTOR to determine the presence of toxic, flammable or explosive vapors or lack of oxygen in accordance with local, state, or federal safety regulations. CONTRACTOR shall follow all procedures outline by OSHA's Confined Space Entry requirements.
- F. The CONTRACTOR shall warrant to the OWNER that the equipment used on this Contract where covered by patents or license agreements is furnished in accordance with such agreements and that the prices included herein cover all applicable royalties and fees in accordance with such license agreements. The CONTRACTOR shall defend, indemnify and hold the OWNER harmless from and against any and all costs, loss, damage or expense arising out of or in any way connected with any claim of infringement of patent, trademark or violation of license agreement.
- G. As part of the work, the OWNER shall request a proposal for a television survey of a particular section of the sewer system. The proposal shall include a detailed cost proposal using the contract line items and a construction schedule showing the suggested time of completion. The suggested time of completion shall be reviewed by the OWNER to determine the total number of calendar days that will be allowed to fully complete the work. The CONTRACTOR shall not be permitted to start any construction until said schedule is submitted by issuance of a work order and a Notice to Proceed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## SECTION 01025

### MEASUREMENT AND PAYMENT

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. Payments to the CONTRACTOR shall be made on the basis of the Bid Proposal as full and complete payment for furnishing all materials, labor, tools and equipment, and for performing all operations necessary to complete the work included in the Contract Documents. Such compensation shall also include payments for any loss or damages arising directly or indirectly from the work, or from any discrepancies between the actual quantities of work and those shown in the Contract Documents.
- B. The prices stated in the Bid Proposal include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation, charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the details and specified herein. The Basis of Payment for an item at the price shown in the Bid Proposal shall be in accordance with its description of the item in this Section and as related to the work specified. Unit prices will be applied to the actual quantities furnished and installed in conformance with the Contract Documents. The items listed below, refer to and are the same pay items listed in the Bid Proposal. They constitute all of the pay items for the completion of the work. No direct or separate payment will be made for providing miscellaneous temporary or accessory work, services, field offices, layout surveys, job signs, sanitary requirements, testing, safety devices, approval and record drawings, water supplies, power, maintenance of traffic, site preparation, removal of waste, site cleanup, watchmen, bonds, insurance, mobilization, demobilization, and any other requirements of the General Conditions. Compensation for all such services, equipment and materials shall be included in the prices stipulated for the unit pay items listed herein.
- C. The CONTRACTOR's attention is called to the fact that the quotations for the various items of work are intended to establish a total price for completing the work in its entirety. Should the CONTRACTOR feel that the cost for any item of work has not been established in the Bid Proposal or this Section, the cost for that Work shall be included in some other applicable Bid Item, so that the Proposal for the project reflects the total price for completing the work in its' entirety. It is intended that all work required to complete this Contract will be included in the various items as described herein.
- D. In the event that repairs to laterals, mains, manholes, force mains, utilities, or any other public or private property are required due to damage caused by the CONTRACTOR's operations, the CONTRACTOR shall provide and employ all necessary labor, equipment, and materials, at no additional cost, to complete such repairs in accordance with applicable provisions of these specifications.
- E. The OWNER will not provide any space or place to store materials for this project. No payment will be made for stored materials.

## 1.02 MEASUREMENT

- A. The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the OWNER unless otherwise specified. The OWNER will witness all field measurements.
- B. The quantities stated in the Bid Proposal are approximate only and are intended to serve as a basis for the comparison of bids and to fix the approximate amount of the cost of the Project. The OWNER does not expressly or impliedly agree that the actual amount of the work to be done in the performance of the contract will correspond with the quantities in the Bid Proposal; the amount of work to be done may be more or less than the said quantities and may be increased or decreased by the OWNER as circumstances may require. The increase or decrease of any quantity shall not be regarded as grounds for an increase in the unit price or in the time allowed for the completion of the work. Although, if any quantity in the Bid is increased or decreased by 25% of the amount in the Bid Proposal form, or any item(s) or work is extended or increased by 25% of the amount in the Bid Proposal form, the OWNER retains the right to re-negotiate the unit price of said item(s).

## 1.03 CONTRACT DURATION

- A. As specified in the Form of Contract.

## 1.04 PERFORMANCE AND PAYMENT BONDS

- A. As specified in the Instructions to Bidders.

## 1.05 PAYMENT ITEMS

- A. Mobilization (Item 1)

This item will be paid for at the lump sum price names in the Bid Schedule for Work necessary to move onto site, set up temporary utilities, pull necessary permits, provide proper bonds, site office, project management and all necessary to begin the Work contained in the Contract Documents.

Maximum allowable price for Mobilization is limited to \$10,000.00

Sewer main cleaning and TV inspection

- B. Sewer main cleaning and TV inspection (4-inch through 30-inch) (Items 2 to 5)

- 1. This item will be paid for at the unit price bid per foot of sewer cleaned and televised for inspection only. The unit price shall provide full compensation for all work required to perform television inspection of sanitary sewer including, but not limited to, furnishing all labor, equipment and material for cleaning, flow isolation, TV inspection, and all incidentals related to sewer inspection. The products shall be acceptable to the ENGINEER or otherwise the CONTRACTOR shall re-televiser the sewer line to the satisfaction of the ENGINEER.
- 2. Cleaning and TV inspection performed to prepare for a repair or to document a completed repair are not considered separate pay items. Costs for such cleaning

and TV inspection shall be included in the contract unit cost for each particular repair.

- C. Sewer lateral cleaning and TV inspection from main to the House Connection at the Structure (Item 6)
  - 1. This item of work will be measured and paid at the unit price per each of the laterals televised from the main line to the house connection at the structure. Payment of the unit price per each will provide for complete compensation for furnishing all labor, equipment, tools, and materials for preparatory cleaning and televising of sanitary sewer service laterals, including all incidents such as traffic control, sewer plugging, sanding and recording the location on the pavement or grass as well as depicted on the reports.
  
- D. Cleanout installation (Item 7)
  - 1. This item of work will be measured and paid for at the unit price per each. Payment of the unit price per each will provide complete compensation for furnishing materials and all labor, tools, equipment and incidentals, to locate utilities; locate lateral; excavate; install a t-wye fitting, cleanout riser with cover and plug at the property line; backfill; compact; and restore surface in grass, asphalt, or concrete as applicable, complete in place. Cleanout depth is up to eight (8') feet for this Line Item.
  
- E. Mechanical root or grease removal (Items 8 to 12)
  - 1. Removal of roots or grease involving the use of special equipment will be considered special cleaning and will be measured and paid per linear foot (additionally to cleaning, depending on the pipeline diameter and the type of cleaning, as shown on the Schedule of Prices.
  
- F. Mechanical tuberculation removal (Items 13 to 16)
  - 1. Removal of tuberculation in cast iron pipe involving the use of special equipment will be considered special cleaning and will be measured and paid per linear foot additionally to cleaning, depending on the pipeline diameter and the type of cleaning, as shown on the Schedule of Prices.
  
- G. Protruding service connection removal by internal means (Item 17)
  - 1. The OWNER may request that the CONTRACTOR remove (protruding service connections, typically to allow completion of inspection or as a prelude to lining. Removal of these protruding services will be made at the unit price per each. The CONTRACTOR shall use non-destructive robotic techniques and completely seal the lateral connection watertight at the pipe interface. The use of equipment that may damage the existing service connection will not be allowed. The CONTRACTOR shall not perform this work prior to receiving written authorization from the OWNER.

H. Bypass Pumping (Items 18 to 21)

1. These items shall provide full compensation for bypass pumping operations required for sewer and manhole televising, cleaning, testing, and inspecting. The CONTRACTOR shall attempt to perform the sewer work without bypass pumping. However, if, in the opinion of the OWNER bypass pumping is necessary, it will be identified as a payment item. The pay item is a charge per day for all bypass pumping operations during specific sewer televising, cleaning, flow monitoring, inspection, or testing, including services, regardless of the number pumps required. Bypass pumping shall be bid on the basis of sewer size which is bypassed. All service shall be maintained during by-pass pump operations.
2. These items shall include, but not be limited to, all necessary and required traffic control; pumps; tanker trucks, piping; gasoline/diesel fuel; maintenance; transportation and storage; temporary bypass and service piping; labor; materials and/or any other costs associated with bypass pumping.
3. Plugging or blocking a sewer line shall be included in the appropriate bid item for which the flow must be stopped, and shall be considered incidental work and no additional payment shall be considered.

I. Traffic control (flagmen, each) (Item 22)

1. Payment shall be at the unit price bid, per each man-hour.

J. Traffic control (arrow board, each) (Item 23)

1. Measurement shall be on a unit basis per each by actual count of arrow boards in place.
2. Payment shall be at the unit price bid, per each arrow board and shall include full compensation for furnishing and placing all materials and furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

K. Traffic control (barricade, each) (Item 24)

1. Measurement shall be on a unit basis per each by actual count of barricades in place.
2. Payment shall be at the unit price bid, per each barricade and shall include full compensation for furnishing and placing all materials and furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

L. Remobilize for Cleaning (Item 25)

1. Payment shall be at the unit price bid, each, remobilization for cleaning, shall be full compensation for setting up a new a location at the downstream or upstream manhole due to blockage in the pipe from the original setup including furnishing all materials and equipment, labor, and incidentals necessary to complete the work as specified.



M. Seven Consecutive Days of Flow Monitoring (Item 26)

1. Payment shall be at the unit price bid, each seven day monitoring at all City maintained Lift Stations during the wet season, and shall be full compensation for the monitoring of the flow at each lift station per the Contract Documents. All materials and equipment, meters, excavation, backfill, labor, and incidentals necessary to complete the work as specified shall be provided.

N. Electro Scan Leak Detection (Item 27)

1. Payment shall be at the unit price bid, per linear foot for the pipe actually tested for leakage using the Electro-Scan leak detection. All materials and equipment, meters, excavation, backfill, labor, and incidentals necessary to complete the work as specified shall be provided.

O. Dyed Water Flooding/Leak Quantification and Evaluation (Item 28)

1. Payment shall be at the unit price bid, per linear foot for the pipe actually tested for leakage using the water dye. All materials and equipment, dye, video, excavation, backfill, labor, and incidentals necessary to complete the work as specified in the Contract Documents shall be provided.

P. Smoke Testing (Item 29)

1. Payment shall be at the unit price bid, per linear foot for the pipe actually tested for leakage using smoke testing. All materials and equipment, smoke, video, excavation, backfill, labor, and incidentals necessary to complete the work as specified in the Contract Documents shall be provided.

Q. Manhole Inspections (Item 30)

1. Payment shall be at the unit price bid, each for inspecting manholes and shall be full compensation for the inspection of all manholes, including but not limited to furnishing all materials and equipment, labor, and incidentals necessary to complete the work as specified in the Contract Documents.

END OF SECTION

## SECTION 01300

### SUBMITTALS

#### PART 1 - GENERAL

##### 1.01 DEFINITIONS

- A. The term "submittals" shall mean: flow meter catalog sheet, certification of calibration of meter, brochures, Maintenance of Traffic Plans, descriptive literature, diagrams, schedules, calculations, performance charts, test reports, and items of similar nature which are normally submitted for the OWNER's review for conformance with the design concept and compliance with the Contract Documents.

##### 1.02 GENERAL REQUIREMENT FOR SUBMITTALS

- A. Project data shall include manufactures' standard flow meter catalog sheet for meter used to measure flow, and certification of calibration of meter used to measure flow. Each copy of descriptive literature shall be clearly marked to identify pertinent information as it applies to the project.
- B. All submittals shall be marked to identify the project, CONTRACTOR, or subcontractor; pertinent Contract Documents; and specification section if applicable.
- C. Prior to submittal to the OWNER, the CONTRACTOR shall review and check submittals, and shall indicate review by his stamp, initials, and date.
- D. If the submittals indicate deviations from the Contract Documents, the CONTRACTOR shall advise the OWNER, in the letter of transmittal of the deviation and the reasons thereof. All deviations and variances shall be clearly marked on the submittal with a bold red mark. All additional costs resulting from modifications requested by the CONTRACTOR shall be borne by the CONTRACTOR.
- E. In the event the OWNER does not specifically reject the use of equipment at variance to that which is in the Contract Documents or specified, the CONTRACTOR shall, at no additional expense to the OWNER, and using methods reviewed by the OWNER, make any changes necessary to accommodate the equipment.
- F. Additional information on particular items, such as special drawings, schedules, calculations, performance curves, and material details shall be provided when specifically requested in the Specifications.
- G. Where manufacturers' brand names are given in the Specifications the CONTRACTOR shall submit names and descriptive literature of such equipment proposed for use in this Contract.
- H. All bulletins, brochures, instructions, equipment lists, and warranties packaged with and accompanying equipment used on the project shall be saved and transmitted to the OWNER.

## 1.03 SUBMITTAL PROCEDURES

### A. Scheduling and Handling

1. The CONTRACTOR shall schedule submittals well in advance of the need for the equipment for proposed scope of work and shall allow time to make delivery of equipment after submittal is approved.
2. The CONTRACTOR shall develop a submittal schedule that allows sufficient time for initial review, correction, resubmission, and final review of all submittals. The OWNER shall review and return submittals to the CONTRACTOR as expeditiously as possible but the amount of time required for review will vary depending on the complexity and quantity of data submitted. In no case will a submittal schedule be acceptable which allows less than 30 days for initial review by the OWNER. The time for review shall in no way be justification for delays or additional compensation to the CONTRACTOR.
3. The OWNER's review of submittals covers only general conformity to the Contract Documents and general conformity with dimensions and elevations. The CONTRACTOR shall be responsible for accuracy of dimensions and elevations. Quantities will be determined or verified by the OWNER's Representative. The CONTRACTOR is responsible for any errors, omissions, or deviations from the contract requirements. Review of submittals in no way relieves the CONTRACTOR from his obligation to furnish required items according to the Contract Documents.
4. The CONTRACTOR shall submit five (5) copies of submittal documents unless otherwise specified in the following paragraphs.
5. The CONTRACTOR shall revise and resubmit submittals as required and identify all changes made since previous submittal.
6. The CONTRACTOR shall assume the risk for equipment that is delivered prior to approval. No equipment shall be incorporated into the Work or included in periodic progress payments until approval has been obtained in the specified manner.

### B. Transmittal Form and Numbering

1. The CONTRACTOR shall transmit each submittal with a Submittal Form approved by the OWNER.
2. The CONTRACTOR shall sequentially number each transmittal form beginning with the number 1.
3. The CONTRACTOR shall revise submittals with original number and sequential alphabetic suffix.
4. Videotapes submittal number shall be in accordance with requirements of this section.

C. CONTRACTOR'S STAMP

1. The CONTRACTOR shall apply CONTRACTOR's stamp, initials, and date certifying that the items have been reviewed in detail and are correct and in accordance with Contract Documents, except as noted by any requested variance.
2. As a minimum, CONTRACTOR's Stamp shall include:
  - a. CONTRACTOR's name
  - b. Job number
  - c. Submittal number
  - d. Certification statement that the CONTRACTOR has reviewed the submittal and it is in compliance with the Contract Documents.
  - e. Signature line for CONTRACTOR
  - f. The CONTRACTOR shall place CONTRACTOR's Stamp on the front page of each document.

1.04 PROJECT PROGRESS SCHEDULES

- A. The CONTRACTOR shall submit Construction Progress Schedules in accordance with Section 01310 - Project Progress Schedules.

1.05 OPERATIONS AND MAINTENANCE DATA

- A. When specified in Specification sections, the CONTRACTOR shall submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, operation, adjusting, finishing, and maintenance.
- B. The CONTRACTOR shall identify conflicts between manufacturers' instruction and Contract Documents.

1.06 MANUFACTURERS' CERTIFICATES

- A. When specified in Specification section, the CONTRACTOR shall submit manufacturers' certificate of compliance for review by the OWNER, and for project records.
- B. The CONTRACTOR shall submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates must be recent test results on existing lines acceptable to the OWNER.

1.07 CONSTRUCTION PHOTOGRAPHS

- A. When required by Specification sections, the CONTRACTOR shall submit photographs taken to show manhole and cleanout conditions

- B. When required by Specification sections, the CONTRACTOR shall submit photographs monthly with pay estimate.
- C. The CONTRACTOR shall make two prints; color, matte, finish; 3x5 inch size; mounted on 8-1/2x11 inch soft card stock, with left edge binding margin for three-hole punch. The CONTRACTOR shall submit one print to the OWNER and retain the other prints.
- D. The CONTRACTOR shall identify photographs with date, time, orientation, and project identification.

1.08 PROJECT RECORD DOCUMENTS

- A. The CONTRACTOR shall submit Project Record Documents in accordance with Section 01700 - Project Closeout

1.09 VIDEO

- A. The CONTRACTOR shall submit television videotapes as required in Section 02752 - Television Survey
- B. Transmittal forms for videotapes shall be numbered sequentially.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## SECTION 01310

### PROJECT PROGRESS SCHEDULES

#### 1.01 REFERENCES

- A. Associated General Contractor of America (AGC) Publication: "The Use of CPM in Construction - A Manual for General CONTRACTORS and the Construction Industry."

#### 1.02 REQUIREMENTS

- A. The project management scheduling tool, "Critical Path Method" commonly called CPM, shall be used by the CONTRACTOR for the planning and scheduling of all work required under the Contract Documents.

#### 1.03 QUALIFICATIONS

- A. The CONTRACTOR shall submit evidence of CPM capability for Engineer's review.

#### 1.04 FORMAT

- A. The CONTRACTOR shall prepare a network analysis system using the Critical Path Method, as outlined in AGC - The Use of CPM in Construction.

#### 1.05 CONTENT

- A. Show complete sequence of cleaning, televising, testing, and metering of flows by activity, which dates for beginning and completion of each element.
- B. Identify each item by Specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Provide sub-schedules for each stage of work identified in Section 01010 - Summary of Work.
- E. Provide sub-schedules to define critical portions of the entire schedule.
- F. Include conferences and meeting in schedule.
- G. Show accumulated percentage of completion of each item and total percentage of work completed, as of the first day of each month.
- H. Provide separate schedule of submittal dates for equipment data, and samples, and dates reviewed submittals will be required from ENGINEER.

#### 1.06 REVISIONS TO SCHEDULES

- A. The CONTRACTOR shall indicate progress of each activity to date of submittal, and projected completion date of each activity.

- B. The CONTRACTOR shall identify activities modified since previous submittal, major change in scope, and other identifiable changes.
- C. The CONTRACTOR shall provide narrative report to define problem areas, anticipated delays, and impact on Schedule. The CONTRACTOR shall report corrective action taken, or proposed, and its effect including the effect of changes on schedules for separate CONTRACTORS.

#### 1.07 SUBMITTAL PROCEDURES

- A. Submittal requirements shall include:
  - 1. Logic network and/or time phased bar chart, computer generated, utilizing the precedent diagram method.
  - 2. Computerized network analysis.
    - a. Activity sort by early start, organized by related elements.
    - b. Activity sort by float, organized by related elements.
    - c. Activity sort by predecessor/successor.
  - 3. Schedule of submittals.
  - 4. Schedule of values.
- B. Within fifteen (15) working days after Notice to Proceed, the CONTRACTOR shall submit a network diagram describing the activities to be accomplished in the project and their dependency relationships, (predecessor/successor) as well as a tabulated schedule as defined in this section. The schedule produced and submitted shall indicate a project completion date the same as the Contract completion date. The CONTRACTOR shall meet with the ENGINEER and OWNER to review the proposed plan and schedule.
- C. Upon completion of the ENGINEER's and OWNER's review of the submittal, the Engineer will return the schedule with comments. The CONTRACTOR shall revise the network diagram as required and resubmit the network diagram and tabulated schedule shall be reviewed by the Engineer and OWNER. The network diagram and tabulated schedule shall constitute the project work schedule unless a revised schedule is required due to substantial changes in the Work scope, a change in Contract Time, or delinquency by CONTRACTOR requiring a recovery schedule. When the network diagram and tabulated schedule have been accepted, the CONTRACTOR shall submit to the Engineer five (5) copies of all schedule information.
- D. The CONTRACTOR, if requested by the Engineer, shall provide a revised work schedule. The revised work schedule shall include a new diagram and tabulated schedule designed to show how the CONTRACTOR intends to accomplish the Work to meet the completion date. The form and method employed by the CONTRACTOR shall be the same as for the original schedule.

## 1.08 SCHEDULING RESPONSIBILITIES

- A. It is understood that the construction schedule and all revised information must be produced by the CONTRACTOR and subcontractors as to how they envision the Work to be accomplished. Similarly, all progress information to be provided by and through the CONTRACTOR must be an accurate representation of the CONTRACTOR's, the subcontractor's, actual performance. The schedule shall at all times remain an accurate reflection of the CONTRACTOR's actual or projected sequencing of the Work. Once accepted by the Engineer adherence to the established CPM schedule shall be obligatory upon the CONTRACTOR and the subcontractors for the Work under the Contract.
- B. Progress of the Work
1. The CONTRACTOR shall start Work within ten (10) days following the Notice to Proceed and shall be executed with such progress as may be required to prevent delay to the general completion of the project. The Work shall be executed at such times and in or on such parts of the project, and with such forces, and equipment, to ensure completion of the Work in the time specified by the Contract.
  2. The CONTRACTOR agrees that whenever it becomes apparent from the current monthly CPM Schedule update that delays to the critical path have resulted and, hence, the Contract completion date will not be met, or when so directed by the Engineer or OWNER, the CONTRACTOR shall take some or all of the following actions at no additional cost to the Owner:
    - a. Increase construction manpower in such quantities as will substantially eliminate the backlog of Work.
    - b. Increase the number of working hours per shift, shifts per working day, or days per week, the amount of equipment, or any combination of the foregoing to substantially eliminate the backlog of Work.
    - c. Reschedule activities to achieve maximum practical concurrence of accomplishment of activities, and comply with the revised schedule.
    - d. The CONTRACTOR shall submit to the Engineer for review a written statement of the steps intended to be taken to remove or arrest the delay to the critical path in the accepted schedule. If the CONTRACTOR should fail to submit a written statement of the steps as required by the Contract, the Engineer may direct the level of effort in manpower (trades), equipment, and work schedule (overtime, weekend, and holiday work, etc.), to be employed by the CONTRACTOR in order to remove or arrest the delay to the critical path in the accepted schedule, and the CONTRACTOR shall promptly provide such level of effort at no additional cost to the OWNER

## 1.09 CHANGE ORDERS

- A. Upon approval of a Change Order, the approved change shall be reflected in the next scheduled submittal by the CONTRACTOR.



PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## SECTION 01400

### QUALITY CONTROL

#### PART 1 - GENERAL

##### 1.01 QUALITY ASSURANCE

- A. The CONTRACTOR shall monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. The CONTRACTOR shall comply with manufacturer's instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, the CONTRACTOR shall request clarification from the OWNER before proceeding.
- D. The CONTRACTOR shall comply with specified standards as minimum quality for the Work except where more stringent tolerance, codes, or specified requirements indicate higher standards or more precise performance.
- E. All Work shall be performed by persons qualified to ensure required and specified quality.

##### 1.02 CONTROL OF WORK

- A. Authority of OWNER
  - 1. The OWNER shall give all orders and directions contemplated under this Contract relative to the execution of the Work. The OWNER shall determine the amount, quality, acceptability, and fitness of the several kinds of Work that are to be paid for under this Contract and shall decide all questions that may arise in relation to said Work and the construction thereof. The OWNER's estimates and decisions shall be final and conclusive, except as otherwise expressly provided herein. Should any questions arise between the parties relative to the Contract, the determination or decision of the OWNER shall be precedent to the right of the CONTRACTOR to receive any money or payment for Work.
  - 2. The OWNER shall decide the meaning and intent of any portion of the Specifications and of any Contract Documents where the same may be found obscure or to be in dispute.
  - 3. Any differences or conflicts in regard to their work that may arise between the CONTRACTOR under this Contract and other CONTRACTORS performing work for the OWNER shall be adjusted and determined by the OWNER.
  - 4. The OWNER shall have the authority to suspend the Work wholly in part, due to failure of the CONTRACTOR to carry out provisions of the Contract; for failure to carry out orders; for such periods as he may deem necessary due to unsuitable weather; for conditions considered unsuitable for prosecution of the Work; or for any other condition or reason deemed to be in the public interest.

5. The OWNER shall have the authority to regulate and coordinate the stages of progress of construction, or items of Work of the respective CONTRACTORS to affect necessary cooperation and satisfactory performance and completion. The OWNER's decision shall be binding in any dispute in the Work arising between CONTRACTORS.

B. Conformity with Contract Documents

1. All Work and all equipment shall be in close conformity with the testing, televising, cleaning, and flow monitoring requirements that are specified (including specified tolerances) in the Contract Documents
2. If the OWNER finds the Work performed, not within close conformity with the Contract Documents, but that the portion of the Work affected will, in his opinion, result in a finished product having a level of accuracy acceptable, the OWNER will advise that the affected Work be accepted. In this event, the OWNER will document his determination and recommend a basis of acceptance that may provide for an adjustment in the Contract Price for the affected portion of the Work. The OWNER's determination and recommended Contract Price adjustments will be based on actual measurements, sound judgment and tests and retests of affected Work as are, in his opinion, needed. Changes in the Contract Price shall be covered by change order.
3. If the OWNER finds the material furnished Work performed, equipment used or the information contained in the submittals are not in close conformity with the Contract Documents and have resulted in non-conformity with Contract Documents, the affected Work shall be revised per new testing and/or monitoring by, and at the expense of the CONTRACTOR in accordance with the OWNER's written notification.
4. For the purpose of this subsection, the term "close conformity" shall not be construed as waiving the CONTRACTOR's responsibility to complete the Work in accordance with the Contract Documents. The term shall not be construed as waiving the OWNER's right to insist on strict compliance with the requirements of the Contract Documents during the CONTRACTOR's prosecution of the Work when, in the OWNER's opinion, such compliance is essential to provide an acceptable finished portion of the Work.
5. For the purpose of this subsection, the term "close conformity" is also intended to provide the OWNER with the authority to use sound judgment in his determinations as to acceptance of Work that is not in strict conformity but will provide a finished product equal to or better than that intended by the requirements of the Contract Documents.

C. Cooperation of CONTRACTOR

1. The CONTRACTOR shall, and will, do and perform all Work and furnish all machinery, equipment, facilities, and means, necessary for proper completion of all the Work required by the Contract, within the time specified, and in accordance with provisions of these Contract Documents. The Work performed shall be in

accordance with the directions of the OWNER. The CONTRACTOR shall furnish, erect, maintain, and remove such temporary works as may be required. The CONTRACTOR alone shall be responsible for the safety, efficiency, and adequacy of his operations, appliances, methods, and for any damage which may result from the failure or improper Work, maintenance, or operation. The CONTRACTOR shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the Contract Documents, and shall do, carry on, and complete the entire Work to the satisfaction of the OWNER.

2. If, through acts of neglect on the part of the CONTRACTOR, any other CONTRACTOR or any subcontractor suffers loss or damage on their work, the CONTRACTOR agrees to settle with such other CONTRACTOR or subcontractor by agreement or arbitration. If such other CONTRACTOR or subcontractor shall assert any claim against the OWNER on account of any damage alleged to have been sustained, the OWNER shall notify the CONTRACTOR who shall indemnify and save harmless the OWNER against any such claim.
3. The CONTRACTOR will be supplied with two copies each of the Contract Documents. The CONTRACTOR shall have on the Work at all times one copy each of the Contract Documents. A reasonable number of additional copies of Contract Documents may be obtained by the CONTRACTOR upon request.
4. The CONTRACTOR shall give constant attention to the Work to facilitate the progress thereof, and he shall cooperate with the OWNER and the OWNER's Representative and with other CONTRACTORS in every way possible. The OWNER shall allocate the Work and suggest the sequence of testing, televising, cleaning, testing and inspection in case of controversy between CONTRACTORS. The CONTRACTOR shall have competent supervision on-site at all times during the course of the work. Superintendent shall be fully authorized to act as the CONTRACTOR's agent on the project. The superintendent shall be capable of reading and thoroughly understanding the Contract Documents and shall receive and fulfill any instructions from the OWNER or his authorized representative.

#### D. Authority and Duties of OWNER's Representative

1. The OWNER's Representative shall have full authority to reject any defective workmanship and to inform the CONTRACTOR that testing, televising, cleaning, flow monitoring and inspection) is being improperly performed (if such is the case), subject to final decision of the OWNER. OWNER's Representative will not be authorized to revoke, alter, enlarge, or relax the provisions of the Contract Documents or to issue any instructions contrary thereto.
2. The CONTRACTOR may request, and the OWNER will issue, written instructions on any important questions which may develop in respect to the acceptance or rejections of testing, televising, cleaning, flow monitoring or inspections as outlined in the Contract Documents.

E. OWNER's Representative

1. The OWNER may assign a representative to observe the progress of the Work and advise the OWNER. The OWNER's Representative shall have full access to all job records

F. Inspection of the Work

1. The OWNER will observe all phases of the Work in progress. The CONTRACTOR shall furnish the OWNER with every reasonable facility for ascertaining whether or not the Work as performed is in accordance with the requirements and intents of the Contract Documents.
2. Should the Contract Work include relocation, adjustment, or any other modification to existing facilities, not the property of the OWNER, authorized representatives of the OWNERS of such facilities shall have the right to inspect such work. Such inspection shall in no case make any facility OWNER a party to the Contract, and shall in no way interfere with the rights of the parties to this Contract.

G. Load Restrictions

1. The CONTRACTOR shall comply with all legal load restrictions in the hauling of equipment on public roads beyond the limits of the Work. A special permit will not relieve the CONTRACTOR of liability for damage that may result from the moving of equipment.
2. The operation of equipment of such weight or so loaded as to cause damage to structures or to any other type of (infrastructure) will not be permitted. The CONTRACTOR shall be responsible for all damage done by his hauling equipment and shall correct such damage at his own expense.

H. Test Period and Final Acceptance

1. As each separate principal part of the Work is completed it shall be immediately reviewed by the OWNER and the Engineer. If found to be in substantial compliance with the Contract Documents, it shall be tentatively accepted by the OWNER.
2. Operation and maintenance work prior to, during, and after the test period shall be by and at the expense of the CONTRACTOR and shall be continued until all work performed under the Contract has been formally accepted by the OWNER.
3. After the test period has been concluded and the performance of all work under Contract has been completed, the OWNER, the CONTRACTOR, and a representative of the OWNER shall make a joint review of all phases of the Work. If the Work is not acceptable at the time of such review, the OWNER will notify the CONTRACTOR of the inaccuracies or omissions that must be remedied before final acceptance can be made.

I. Storage of Equipment

1. Unless otherwise in the Contract Documents, the location of the CONTRACTOR's parked equipment or vehicles shall be as directed by the OWNER. Private property shall not be used for storage purposes without written permission of the private property OWNER or lessee of such property. The CONTRACTOR shall make all arrangements and bear all expenses for the storage of equipment on private property. Upon request, the CONTRACTOR shall furnish the OWNER a copy of the property OWNER's permission. All storage sites on private property shall be restored to their original condition by the CONTRACTOR entirely at his own expense, except otherwise agreed to, in writing by the private property OWNER or lessee of the property.
2. The CONTRACTOR shall be responsible for loss, damage, or deterioration of equipment caused by improper protection from the weather or from other sources of damage.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## SECTION 01510

### TEMPORARY UTILITIES

#### PART 1 - GENERAL

##### 1.01 GENERAL REQUIREMENTS

- A. The CONTRACTOR shall provide for utilities and services for its own operations.

The CONTRACTOR shall furnish, install and maintain all temporary utilities during the contract period including removal upon completion of the work.

##### 1.02 JOB CONDITIONS

- A. Scheduled Uses: The CONTRACTOR shall, in conjunction with establishment of job progress schedule, establish a schedule for implementation and termination of service for each temporary utility or facility; at earliest feasible time.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS

- A. The CONTRACTOR shall provide either new or used materials and equipment, which are in substantially undamaged condition and without significant deterioration and which are recognized in the construction industry, by compliance with appropriate standards, as being suitable for intended use in each case. Where a portion of temporary utility is provided for CONTRACTOR by utility company, the CONTRACTOR shall provide remainder with matching and compatible materials and equipment and comply with recommendations of utility company.

#### PART 3 - EXECUTION

##### 3.01 INSTALLATION OF TEMPORARY UTILITY SERVICES

- A. General: Wherever feasible, the CONTRACTOR shall engage the utility company to install temporary service to project, or as a minimum, to make connection to existing utility service; locate services where they will not interfere with total project construction work, including installation of permanent utility services; and maintain temporary services as installed for required period of use; and relocate, modify or extend as necessary from time to time during that period as required to accommodate total project construction work.

Approval of Electrical Connections: All temporary connections for electricity shall be subject to approval of the OWNER and the power company representative, and shall be removed in like manner at the CONTRACTOR's expense prior to final acceptance of the work.

Separation of Circuits: Unless otherwise permitted by the OWNER, circuits separate from lighting circuits shall be used for all power purposes.

Construction Wiring: All wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. All electrical facilities shall conform to the requirements of Subpart K of the OSHA Safety and Health Standards for Construction.

### 3.02 INSTALLATION OF POWER DISTRIBUTION SYSTEM

- A. Power: The CONTRACTOR shall provide all necessary power required for its operations under the Contract, and shall provide and maintain all temporary power lines required to perform the work in a safe and satisfactory manner.
- B. Temporary Power Distribution: The CONTRACTOR shall provide a weatherproof, grounded, temporary power distribution system sufficient to accommodate performance of entire work of project, including, but not necessarily limited to, temporary electrical heating where indicated, operation of test equipment and test operation of building equipment and systems which cannot be delayed until permanent power connections are operable, temporary operation of other temporary facilities, and power for temporary operation of existing facilities (if any) at the site. Provide circuits of adequate size and proper power characteristics for each use; run circuit wiring generally overhead, and rise vertically in locations where it will be least exposed to possible damage from operations, and result in least interference with performance of the work

### 3.03 INSTALLATION OF LIGHTING

- A. Temporary Lighting: The CONTRACTOR shall provide a general, weatherproof, grounded temporary lighting system in every area of work, and provide sufficient illumination for safe work and traffic conditions; and run circuit wiring generally overhead, and rise vertically in locations where it will be least exposed to possible damage from operations on areas of possible damage or abuse.

### 3.04 INSTALLATION OF SANITARY FACILITIES

- A. Toilet Facilities: Fixed or portable chemical toilets shall be provided wherever needed for the use of CONTRACTOR's employees. Toilets at construction job sites shall conform to the requirements of Subpart D, Section 1926.51 of the OSHA Standards for Construction.
- B. Sanitary and Other Organic Wastes: The CONTRACTOR shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the CONTRACTOR or organic material wastes from any other source related to the CONTRACTOR's operations shall be disposed of away from the site in a manner satisfactory to the OWNER and in accordance with all laws and regulations pertaining thereto.

END OF SECTION



## SECTION 01560

### TEMPORARY ENVIRONMENTAL CONTROLS

#### PART 1 - GENERAL

##### 1.01 DUST ABATEMENT

- A. The CONTRACTOR shall furnish all labor, equipment, and means required and shall carry out effective measures wherever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. The CONTRACTOR shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the CONTRACTOR is relieved of further responsibility by the ENGINEER or OWNER.

##### 1.02 RUBBISH CONTROL

- A. During the progress of the work, the CONTRACTOR shall keep the site of the work and other areas used by it in a neat and clean condition, and free from any accumulation of rubbish. The CONTRACTOR, on a daily basis, shall dispose of all rubbish and waste materials of any nature occurring at the work site, and shall establish regular intervals of collection and disposal of such materials and waste. The CONTRACTOR shall also keep its roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations.
- B. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.

##### 1.03 SANITATION

- A. Toilet Facilities: Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Part 1926 of the OSHA Standards for Construction.
- B. Sanitary and Other Organic Wastes: The CONTRACTOR shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the CONTRACTOR or organic material wastes from any other source related to the CONTRACTOR's operations shall be disposed of away from the site in a manner satisfactory to the OWNER and in accordance with all laws and regulations pertaining thereto.

##### 1.04 CHEMICALS

- A. All chemicals used during the duration of the whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

#### 1.05 NOISE CONTROL

- A. Noise resulting from the CONTRACTOR's work shall not exceed the noise levels and other requirements stated in local ordinances. The CONTRACTOR shall be responsible for curtailing noise resulting from his operation. He shall, upon written notification from the OWNER of the noise control officers, make any repairs, replacements, adjustments, additions and furnish mufflers when necessary to fulfill requirements.

#### 1.06 EROSION ABATEMENT AND WATER POLLUTION

- A. It is imperative that any CONTRACTOR dewatering operation not contaminate or disturb the environment of the adjacent properties. The CONTRACTOR shall, therefore, schedule and control his operations to continue all runoff water from disturbed surfaces, water from cleaning and testing operations that becomes contaminated with lime silt, muck and other deleterious matter, fuels, oils, bitumens, calcium, chloride, chemicals and other polluting materials.
- B. The CONTRACTOR shall construct temporary silting basin(s) of adequate size and provide all necessary materials, operations and controls including, but not limited to, filters, coagulants, screens, and other means necessary to attain the required discharge water quality.
- C. The CONTRACTOR shall be responsible for providing, operating and maintaining materials and equipment used for conveying the clear water to the point of discharge. All pollution prevention procedures, materials, equipment, and related items shall be operated and maintained until such time as the dewatering operation is discontinued. Upon the removal of the materials, equipment and related items, the CONTRACTOR shall restore the area to the condition prior to its commencing work.

#### 1.07 PRECAUTIONS DURING ADVERSE WEATHER

- A. During adverse weather, and against the possibility thereof, the CONTRACTOR shall take all necessary precautions so that the work may be properly done and satisfactory in all respects. The CONTRACTOR shall be responsible for all changes caused by adverse weather.
- B. The OWNER may suspend construction operations at any time when, in his judgment, the conditions are unsuitable or the proper precaution are not being taken, whatever the weather conditions may be, in any season.

#### 1.08 HURRICANE AND STORM WARNINGS

- A. During such periods of time as are designated by the United States Weather Bureau as being a hurricane alert, watch or warning, the CONTRACTOR shall perform all precautions as necessary to safeguard the work and property, including the removal of all small equipment materials from the site, lashing all other equipment and materials to each other and to rigid construction, and any other safety measures as indicated below.
- B. The CONTRACTOR shall submit to the OWNER, for review and approval, a Plan of Action describing the procedures to be followed by the CONTRACTOR in the event of a Hurricane Alert, Watch, or Warning.

C. Upon Notification of a Hurricane Alert:

1. CONTRACTORS performing at all other locations shall remove all unnecessary debris, materials, and equipment from the job site. The CONTRACTOR shall also keep his crew on standby on weekends and holidays during the Hurricane Alert period.

D. Upon Notification of a Hurricane Watch:

1. CONTRACTORS shall implement their approved plan of Action to protect the project and the public.

E. Upon Notification of a Hurricane Warning:

1. CONTRACTORS shall implement their approved plan of action to protect the project and the public.
2. For work within the public right-of-ways, the CONTRACTOR will be notified by the OWNER to suspend his operations. The CONTRACTOR will, remove all construction equipment and materials from the right-of-way and secure operations pending further notice.

1.09 PERIODIC CLEANUP AND BASIC SITE RESTORATION

- A. During construction, the CONTRACTOR shall on a daily basis remove from the site all accumulated debris and surplus materials of any kind which results from its operations. Unused equipment and tools shall be stored at the CONTRACTOR's yard base of operations for the project.
- B. The CONTRACTOR shall perform the cleanup work on a daily basis and as frequently as ordered by the OWNER. Basic site restoration in a particular area shall be accomplished immediately following the completion of the required in the Contract Documents. Furthermore, such work shall also be accomplished, when ordered
- C. Upon failure of the CONTRACTOR to perform clean-up and basic restoration of the site to the OWNER's satisfaction, the OWNER may, upon prior written notice to the CONTRACTOR, employ such labor and equipment as it deems necessary for the purpose, and all costs resulting therefore shall be charged to the CONTRACTOR and deducted from amounts of money that it may be due.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## SECTION 01570

### TRAFFIC REGULATIONS AND MAINTENANCE OF TRAFFIC

#### PART 1 - GENERAL

##### 1.01 TRAFFIC CONTROL

- A. CONTRACTOR shall obey all traffic laws and comply with all the requirements, rules and regulations of the Florida State Department of Transportation, United States Department of Transportation Manual of Uniform Traffic Control Devices, the County, and other local authorities having jurisdiction, to maintain adequate warning signs, lights, barriers, etc., for the protection of traffic on public roadways.
- B. The CONTRACTOR shall maintain traffic and protect the public from all damage to persons and property within the Contract limits, in accordance with the Contract Documents and all applicable state, county and local regulations. He shall conduct his operations so as to maintain and protect access, for vehicular and pedestrian traffic, to and from all properties and business establishments adjoining or adjacent to those streets affected by his operations, and to subject the public to a minimum of delay and inconvenience. Suitable signs, barricades, railing, etc., shall be erected and the work outlined by adequate lighting at night. Danger lights shall be provided as required. Watchmen and flagmen shall be provided as may be necessary for the protection of traffic.
- C. Maintenance of Traffic Plans: When required for specific operations, the CONTRACTOR shall immediately prepare and submit Maintenance of Traffic (M.O.T.) Plans for approval by authorities having jurisdiction. The traffic maintenance plan must meet the requirements of such authorities. Said M.O.T. Plans shall be in written form with sketches or drawings as necessary and shall comply with the State of Florida Department of Transportation standards for M.O.T. and the United States Department of Transportation Manual of Uniform Traffic Control Devices in construction areas. The Plans shall be submitted as soon as possible and not later than two weeks prior to any applicable construction work. A copy of the approval shall be provided to the OWNER.
- D. The CONTRACTOR shall maintain one copy of the approved M.O.T. plan at the Work site for inspection. The OWNER reserves the right to observe the M.O.T. plan in use and to make any changes as field conditions warrant. Any changes shall supersede the plan and be done at the CONTRACTOR's expense.
- E. The CONTRACTOR and his personnel are cautioned against parking vehicles in the business zones for any extended period of time. If necessary, the CONTRACTOR shall obtain offsite parking areas for his personnel.
- F. All dirt spilled from the CONTRACTOR's trucks on existing pavements shall be removed by the CONTRACTOR whenever in the opinion of the OWNER the accumulation is sufficient to cause the formation of mud, dust, interference with traffic or create a traffic hazard.
- G. The CONTRACTOR shall comply with all traffic regulations and perform maintenance of traffic as part of his site operation.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION - (Not Used)

END OF SECTION

## SECTION 01600

### MATERIALS AND EQUIPMENT

#### PART 1 - GENERAL

##### 1.01 PRODUCTS (Not Used)

##### 1.02 TRANSPORTATION AND HANDLING

- A. The CONTRACTOR shall transport and handle equipment in accordance with manufacturers' instructions.
- B. The CONTRACTOR shall promptly inspect shipments to ensure that equipment comply with requirements,
- C. The CONTRACTOR shall make arrangements for transportation, delivery, and handling of equipment required for timely completion of the Work.

##### 1.03 DELIVERY

- A. The CONTRACTOR shall arrange deliveries of equipment to accommodate the project completion schedules. The CONTRACTOR shall avoid deliveries that cause lengthy storage or overburden of limited storage space.
- B. The CONTRACTOR shall coordinate deliveries to avoid conflict with Work and conditions at the site and to accommodate the following:
  - 1. Work of other CONTRACTORS or the OWNER.
  - 2. Limitation of storage space
  - 3. OWNER's use of premises.

##### 1.04 STORAGE OF MATERIAL

- A. The CONTRACTOR shall make necessary provisions for safe storage of equipment. The CONTRACTOR shall place loose soil materials, and materials to be incorporated into the Work to prevent damage to existing facilities and to maintain free access at all times to all parts of the Work and to utility service company installations in the vicinity of the Work. The CONTRACTOR shall keep equipment neatly and compactly stored in locations that will cause a minimum of inconvenience to other CONTRACTORS, public travel, adjoining owners, tenants, and occupants. The CONTRACTOR shall arrange storage in a manner to provide easy access for inspection.
- B. The CONTRACTOR shall restrict storage to areas available on the staging site for storage of equipment as approved by the OWNER.
- C. The CONTRACTOR shall provide off-site storage and protection when on-site storage is not adequate.

- D. The CONTRACTOR shall not use lawns, grass plots, or other private property for storage purposes without written permission of the property owner or other person in possession or control of such premises.
- E. The CONTRACTOR shall protect stored equipment against loss or damage.
- F. Damage to lawns, sidewalks streets, or other improvements shall be repaired or replaced by the CONTRACTOR to satisfaction of the OWNER and the property owner at no additional cost to the OWNER.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## SECTION 01700

### PROJECT CLOSEOUT

#### PART 1 - GENERAL

##### 1.01 CONTRACTOR'S RESPONSIBILITY FOR THE WORK

- A. Until final acceptance by the OWNER as provided for in these Contract Documents, the Work shall be under the charge and care of the CONTRACTOR. The CONTRACTOR shall rebuild, repair, restore, and make good, at his own expense, all injuries or damage to any portion of the Work occasioned by any of the forenamed causes before acceptance.

##### 1.02 CLOSEOUT PROCEDURES

- A. The CONTRACTOR shall submit written certification that Contract Documents have been reviewed, Work has been reviewed by OWNER's Representative and that Work has been completed in accordance with Contract Documents and ready for OWNER's review.
- B. The CONTRACTOR shall provide submittals to the OWNER as required by the Contract Documents.
- C. The CONTRACTOR shall submit final Application for Payment.

##### 1.03 CONTRACT COMPLETION

- A. The Contract will be considered fulfilled, when all the Work has been completed, the final review completed, and final acceptance and final payment have been made by the OWNER.
- B. After final review and upon receipt of satisfactory evidence of payment for all labor used in the Work, the OWNER will notify the CONTRACTOR, in writing, of his acceptance of the Work performed under the contract and of his recommendations in respect to final payment to the CONTRACTOR.

##### 1.04 FINAL SUBMITTALS

- A. Before the final acceptance of the project, the CONTRACTOR shall submit to the OWNER certain records, including testing results, CCTV tapes in DVD/CD format, flow data, inspection reports, all field records in a PDF format and recommendations for repair etc., which are specified elsewhere in the Contract Documents. Missing, incomplete or unacceptable items, as determined by the OWNER, shall constitute grounds for withholding final payment to the CONTRACTOR. A partial list of such items appears below, but it shall be the CONTRACTOR's responsibility to submit any other items which are required in the Contract Documents:
  - 1. Written test results of project completion
  - 2. Written guarantees, where required
  - 3. Video tapes and logs of all lines televised



4. Pre-construction photos

1.05 FINAL CLEANUP

- A. The CONTRACTOR shall promptly remove from the vicinity of the completed Work, all rubbish, unused materials, , temporary facilities, construction signs, , supplies and equipment which may have been used in the performance of the work. The CONTRACTOR shall broom clean paved surfaces and rake clean other surfaces of grounds. Final acceptance of the Work by the OWNER will be withheld until the CONTRACTOR has satisfactorily complied with foregoing requirements for final cleanup of the project site.

PART 2 - PRODUCT (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## SECTION 01900

### SUPPLEMENTAL SPECIFICATIONS

#### PART 1 - GENERAL

##### 1.01 ABOVE GROUND PHYSICAL INSPECTION

Evidence of potential problems with the sewer system will be noted. Infrared scanning, geophysical scanning (GEMS), limited smoke testing and electronic line locating systems may be employed to locate manholes or trace out sewer trunk mains and interceptors. Inspection field crews will also temporarily mark the located system assets to facilitate the GPS survey. The following will be accomplished during this task:

- Investigate the study areas for the purpose of documenting all system assets not shown on the current system maps
- Evidence of line breaks
- Provide listing of system assets that are shown on the existing system maps, but not located in the field
- Provide listing of system assets located by field crews but not shown on the existing system maps
- Provide listing of manholes that were located by field crews, but were not opened due to deterioration of the manhole cover and ring, etc.

##### 1.02 SMOKE TESTING

Smoke will be introduced into the sewer system using a high capacity air blower testing two line segments or manhole reaches at a time. The air blower will have a minimum capacity of 4,000 CFM. This harmless and relatively odorless smoke testing will be performed under dry weather conditions to allow the maximum detection of inflow and rainfall responsive infiltration sources.

This task, as described above, will be employed on the sewer lines within the study area. Above ground reconnaissance of the study area to determine proximity of storm sewers, creek crossings, drainage paths and ponding areas to the sanitary sewer system will be accomplished concurrently with smoke testing and the visual manhole/line inspection. Digital photographs of every smoke leak found will be taken and sketches showing the leak location will be made and attached to the field forms.

Smoke testing data collected in the field will include:

- Upstream/downstream manhole number
- Length of sewer line
- Cover over line segment
- Leak location from two known reference points

- Degree of smoke observed
- Leak drainage path/ponding area
- Storm sewer crossings or cross connections
- Classifications of leaks as:
  - Main line
  - Manhole
  - Public service line
  - Private service line

### 1.03 MANHOLE/CLEANOUT AND SEWER LINE VISUAL INSPECTION

This task consists of opening manholes, examining the interior and inspecting each sewer line entering and leaving the manhole. The sewer lines will be inspected by use of a manhole camera designed for inspection of sewer lines from the ground surface or descending into the manhole, when necessary. Photographs will be taken of the top of the manhole/cleanout, the interior and of all severe defects. Information gathered during this work, including photographs, will be provided with the field forms.

The following data will be recorded for each manhole inspected:

#### ***Manhole/Cleanout Data***

- Manhole/cleanout identification number
- Construction materials and conditions of cover, ring, walls, steps, aprons and troughs
- Manhole depth
- Number and size of holes in manhole/cleanout cover
- Infiltration sources
- Evidence of leaks and location
- Level of high water mark in the manhole
- Type and depth of debris
- Special problems and conditions such as sources of inflow, overflows, bypasses and manholes located in natural ponding areas, etc.
- Structural Defects, if any, will be noted

### ***Line Segment Data***

- Length, size, material and depth of pipe
- Root growth in pipe, if any
- Depth of flow
- Type and depth of deposition in pipe
- Visible inflow/infiltration sources
- Structural conditions of pipe, including joints
- Special problems and conditions in pipe

An attempt (10 minutes per manhole/cleanout) will be made to locate and open every manhole/cleanout in order for the manhole/cleanout to be counted for payment. Inspection personnel will uncover and expose manholes/cleanouts that are buried one-half inch or less in asphalt and six (6) inches or less in unpaved areas.

#### **1.04 DYED WATER FLOODING/LEAK QUANTIFICATION AND EVALUATION**

This task consists of pinpointing inflow sources and quantifying selected collection line, manhole and service line leaks that were identified from the results of previous tasks. Quantification estimates are based on field measurements and empirical values developed from past experience. Leak quantification will also be done by use of portable weirs or hydrostatic devices in conjunction with dye water flooding. This information is then used to evaluate I/I rates and compare to flow monitoring results to determine quantities of I/I. A portion of the dye flooding will be performed in conjunction with the internal (CCTV) inspection.

#### **1.05 SEWER FOR ELECTRO-SCAN LEAK LOCATION (FELL-41™)**

This task begins by placing a string line through a section of sewer pipe from a manhole/co to another manhole/co for the purpose of pulling an Electro-Scan sonde and moving pipe plug through the sewer pipe. The string line will be placed in the pipe using either hydraulically or mechanically powered equipment specifically designed for this purpose. The hydraulically powered equipment may also be used for the placement of water upstream of the moving pipe plug and pulling the sonde through the pipe. This task does not include thorough cleaning of the sewer pipe.

Sewer Electro-Scan locates defects by checking the electrical continuity of the pipe. Most sewer pipe materials are electrical insulators. A defect in the pipe that leaks water will also leak electrical current. For a constant applied voltage, the larger the defect the greater the electric current. This is also the case for water in that for given water pressure the larger the hole the greater the flow.

The Electro-Scan test is carried out by pulling an electrode, called a sonde, through the

pipe and measuring the variation of electric current flow through the all of the pipe, then through the ground to an electrode on the surface – a metal stake driven into the ground. To obtain usable measurements the sonde is specially constructed so the electric current flows only through the pipe wall in a narrow band about an inch wide at the center of the sonde. The sonde also contains a microprocessor that controls the voltage, measures the electrical current flow, records the position of the sonde in the pipe and transmits the data to the surface. The result, a trace of current versus distance, is displayed in real time on a notebook computer.

Identifying current trace anomalies associated with pipe joints (Joint Anomalies) is an essential part of the Electro-Scan analysis. By identifying Joint Anomalies other anomalies due to structural defects such as service connections or pipe cracks can be readily categorized. Joint Anomalies are identified as Anomalies along the current trace occurring at a regular interval that corresponds with the pipe length.

A computer program is used to grade the size and type of each leak and graphically display the defect grade size, type and frequency for each manhole- to-manhole pipe section. The Electro-Scan traces have a resolution of less than 0.1ft. This information can be readily used to qualitatively identify the highest potential infiltration sections and assist with the selection of the most cost effective repair method.

This task, as described above, will be employed on the selected sewer lines within the study area. Electro-Scan testing will be carried out using the FELL- 41™ manufactured by Seba Dynatronic Electro Scan Leak Location (FELL-41™).

Data collected in the field will include:

1. Upstream/downstream manhole number
2. Length of sewer line
3. Manhole depths
4. Pipe defect locations
5. Classifications of defects as large, medium or small
6. If CCTV inspection tapes are available, leaks can be classified as mainline or service tap

Note: Should excessive debris or other obstructions prohibit passage of the Electro-Scan sonde through a line section, the prime contractor shall be responsible for debris removal from the line section by using hydraulic or mechanical cleaning equipment and/or removal of obstructions by point repair or other methods as may be required by the contract. All such items will be paid for utilizing the line item bids for each item.

END OF SECTION

## SECTION 02500

### RESTORATION AND CLEANUP

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. This section covers the work necessary to provide and coordinate the restoration and cleanup of areas disturbed during project execution.
- B. All areas disturbed or damaged during project execution shall be restored to conditions existing prior to the work.
- C. All roadways, sidewalks, curbs, hardscape, irrigation, landscape, etc. disturbed during the course of work, shall be restored to the City of North Miami, FDOT, Miami-Dade County or any other Entity having jurisdiction's minimum standards.

##### 1.02 SUBMITTALS

- A. Submitted construction progress schedule should indicate restoration, by restoration type following the sequencing specified herein. Final cleanup time should also be referenced to the progress schedule.
- B. Submittals shall be in accordance with Section 01300 - Submittals.

#### PART 2 - PRODUCTS (Not Used)

#### PART 3 - EXECUTION

##### 3.01 SODDING

- A. Sod shall be placed to the extent to achieve the conditions existing prior to the work.
- B. Properly prepare subgrade prior to placing sod. Remove excess materials, hand rake and level as necessary to place sod evenly and at grades to match adjacent existing surfaces. Finish sod installation shall provide unimpeded sheet flow of surface water drainage.
- C. Lay sod to form a solid mass with tight-fitting joints. Butt ends and sides of sod strips. Do not overlap. Stagger strips to offset joints in courses. Tamp or roll sod lightly to insure uniform contact with subgrade. Fill minor cracks between pieces of sod with sifted soil.
- D. Where necessary to prevent slippage of new installed sod, peg or pin sod securely using 1" x 1" x 6" wood pegs, driven flush with top of sod.
- E. Water sod thoroughly with a fine spray immediately after installation.
- F. Do not install sod on Friday, Saturday or Sunday, unless provisions are made to water manually or automatically.

- G. CONTRACTOR shall make arrangements to water installed sod through Final Completion of project. Minimum watering frequency required is two waterings per week.

3.02 RESTORATION SEQUENCE

- A. Remove and dispose of excess materials.
- B. Properly sod areas requiring restoration.

END OF SECTION

## SECTION 02730

### PREPARATORY CLEANING AND ROOT REMOVAL

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. This Section covers the preparatory cleaning of sewer lines and manholes as needed prior to the internal survey of the sewer lines by closed-circuit television. It also covers the preparatory cleaning and root removal of sewer lines and the cleaning of manholes prior to rehabilitation. The CONTRACTOR shall furnish all necessary material, labor, equipment and services required for cleaning the specific sewer lines.

##### 1.02 DEFINITIONS

- A. Sewer Line Cleaning: Removal of foreign materials from sewer lines to restore the sewer to a minimum of 95% of the original carrying capacity, for proper seating of pipe lining, or as required by other specified rehabilitation. It is recognized that there are some conditions such as broken pipe and major blockages that prevent cleaning from being accomplished or where additional damage would result if cleaning were attempted or continued. Should such conditions be encountered, the CONTRACTOR will not be required to clean those specific sewer sections. If, in the course of normal cleaning operations, damage does result from preexisting and unforeseen conditions such as broken pipe, the CONTRACTOR will not be held responsible. City shall be notified immediately if these conditions arise.
- B. Manhole Cleaning: All concrete and masonry surfaces must be cleaned prior to repair. Removal of grease, laitance, loose bricks, mortar, unsound concrete, and other materials from manholes. Water blasting (minimum 3,500 psi), utilizing proper nozzles, shall be the primary method of cleaning; however, other methods, such as wet or dry sandblasting, acid wash, concrete cleaners, degreasers, or mechanical means may be required to properly clean the surface. Surfaces on which these other methods are used shall be thoroughly rinsed, scrubbed, and neutralized to remove cleaning agents and their reactant products.
- C. Television Inspection: Operation necessary to complete an internal inspection for verification of existing conditions prior to performing rehabilitation and to verify for approval of rehabilitated sewer segments. CONTRACTOR shall furnish all labor, materials, equipment, tools, and other incidental services for closed circuit television inspection or work.
- D. Light Cleaning: The removal of sand and/or debris occupying up to 25% of the diameter of the pipe.
- E. Medium Cleaning: The removal of sand and/or debris occupying between 25% and 50% of the diameter of the pipe.
- F. Heavy Cleaning: The removal of sand and/or debris occupying more than 50% of the diameter of the pipe.



- G. Specialty Cleaning: The removal of grease, roots, and tuberculation in cast iron pipe; the use of special equipment such as bucket machines; root cutters or internal protruding tap remover.

## PART 2 - PRODUCTS

### 2.01 CLEANING EQUIPMENT

- A. High-Velocity Jet (Hydro-cleaning) Equipment: All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floors and produce at least 3,500-psi pressure. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel.
- B. Mechanically Powered Equipment or Bucket machines used by the CONTRACTOR shall be in pairs with sufficient power to perform the work in an efficient manner. Machines shall be belt operated or have an overload device. Machines with direct drive that could cause damage to the pipe will not be allowed. The power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 750 feet of rod. The rod shall be specifically heat-treated steel. To ensure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.
- C. Hydraulically Propelled Equipment: The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam shall be equal in diameter to the pipe being cleaned and shall provide a flexible scraper around the outer periphery to insure removal of grease. If sewer cleaning balls or other equipment which cannot be collapsed is used, special precautions to prevent flooding of the sewers and public or private property shall be taken.

### 2.02 TELEVISION INSPECTION EQUIPMENT

- A. Television inspection equipment used by the Contractor shall conform to the requirements of the Contract Documents.

## PART 3 - EXECUTION

### 3.01 SANITARY SEWER SYSTEM CLEANING

- A. The CONTRACTOR shall notify the local fire department and the OWNER to obtain approval and water meter, if required, before using fire hydrants.
- B. During sewer cleaning operations, satisfactory precautions shall be taken by the CONTRACTOR in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard the flow in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not damage or cause flooding of public or private property being served by the owner. When possible, the flow of wastewater in the sewer shall be

utilized to provide the necessary pressure for hydraulic cleaning devices. When additional water from fire hydrants is necessary to avoid delay in normal work procedures, the water shall be conserved and not used unnecessarily. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant.

- C. The designated sewer manhole sections shall be cleaned by the CONTRACTOR using hydraulically propelled, high-velocity jet, or mechanically powered equipment. Selection of the equipment used shall be based on the conditions of lines at the time the work commences. The equipment and methods selected shall be satisfactory to the OWNER. The equipment shall be capable of removing dirt, grease, rocks, sand, and other materials and obstructions from the sewer lines and manholes. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, it will be assumed that a major blockage exists and the cleaning effort shall be repeated with other types of equipment.
- D. ALL sludge, dirt, sand, rocks, grease, and other solid or semi-solid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section, which could cause line stoppages, accumulations of sand in wet wells, or damage pumping equipment, shall not be permitted.
- E. Under no circumstances shall sludge or other debris removed during these operations be dumped or spilled into the streets, ditches, storm drains or other sanitary sewers. The CONTRACTOR shall remove from the site and properly dispose of all solids or semi-solids recovered during the cleaning operation. The CONTRACTOR shall obtain permits and make arrangements as required to properly dispose of solids.
- F. The CONTRACTOR is advised that he shall not dispose of this material by legal or illegal dumping on private or public property, by sale to others, or any means other than those given above.
- G. The CONTRACTOR shall keep his haul route and work area(s) neat and clean and reasonably free of odor, and shall bear all responsibility for the cleanup of any spill which occurs during the transport of cleaning/surface preparation by-products and the cleanup of any such material which is authorized by or pursuant to this contract and in accord with applicable law and regulations. The CONTRACTOR shall immediately cleanup any such spill, or waste. If the CONTRACTOR fails to cleanup such spill, or waste immediately, the OWNER shall have the right to cleanup or arrange for its cleanup and may charge to the CONTRACTOR all costs, including administrative costs and overhead, incurred by the OWNER in connection with such cleanup. The OWNER may also charge to the CONTRACTOR any costs incurred or penalties imposed on the OWNER as a result of any spill, dump or discard. Under no circumstances is this material to be discharged into the waterways or any place other than where authorized to do so by the appropriate authority. The term "CONTRACTOR" as used in this section shall include the CONTRACTOR'S subcontractors and other Contractors.
- H. The general requirements for vehicles hauling such waste materials are as follows: Transport vehicles must be of type(s) approved for this application by the political

jurisdictions involved. General requirements are that the vehicles have watertight bodies, that they be properly equipped and fitted with seals and covers to prohibit material spillage of drainage, and that they be cleaned as often as is necessary to prevent deposit of material on roadways. Vehicles must be loaded within legal weight limits and operated safely within all traffic and speed regulations.

- I. The routes used by the CONTRACTOR for the conveyance of this material on a regular basis shall be subject to approval by the governing authority having jurisdiction over such routes.

### 3.02 ROOT REMOVAL

- A. Roots shall be removed by the CONTRACTOR from sewer lines and manholes. Special attention shall be used during the cleaning operation to ensure complete removal of roots from the joints. Any roots which could prevent the traveling of the packer or could prevent the proper application of chemical sealants, or could prevent the proper seating and application of cured-in-place liners, shall be removed. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaner. When specifically directed, chemical root treatment shall be used before the root removal operation, and grouting will take place after root removal

### 3.03 DISPOSAL OF MATERIALS

- A. All solids or semi-solids resulting from the cleaning operations shall be removed from the site and disposed of in accordance with applicable regulations. All materials shall be removed from the site no less often than at the end of each workday. Under no circumstances shall the CONTRACTOR be allowed to accumulate, debris etc., on the site beyond the stated time, except in totally enclosed containers and as approved by the OWNER. The CONTRACTOR shall submit a plan for disposal of solids to the OWNER.

### 3.04 TELEVISION INSPECTION

- A. Television inspection shall be performed by the CONTRACTOR in accordance with requirements of the Contract Documents.

### 3.05 FINAL ACCEPTANCE

- A. Acceptance of sewer line cleaning shall be made upon the successful completion of the television inspection by the CONTRACTOR and shall be to the satisfaction of the ENGINEER. If a TV inspection shows the cleaning to be unsatisfactory, the CONTRACTOR shall be required to re-clean and re-inspect the sewer line until the cleaning is shown to be satisfactory. In areas where television inspection is not performed, the OWNER may require the CONTRACTOR to pull a double squeegee (with each squeegee the same diameter as the sewer) through each manhole section as evidence of adequate cleaning. If lining is to follow the television inspection, particular attention shall be given to the adequacy of the cleaning to ensure that proper seating of the liner can be achieved.

- B. In addition, on all those lines which have sags or dips, to an extent that the television camera lens becomes submerged for three (3) or more feet during the television inspection, the CONTRACTOR shall pull double squeegee and/or sponges through the line in order to remove the water from those dips or sags, or draft the water by means of high-velocity jet cleaners. Water removal shall be performed until the television camera lens will no longer be submerged. This requirement may be waived by the OWNER if the water in which the camera lens is submerged is clear enough to allow the identification of pipe defects, cracks, holes and location of service taps.

END OF SECTION

## SECTION 02750

### WASTEWATER FLOW CONTROL

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. The work specified in this Section includes all labor, materials, accessories, equipment and tools for performing all operations required to bypass pump sewage around a manhole or sewer section in which work is to be performed. The CONTRACTOR shall be prepared to bypass pump sewage as a part of his operations.
- B. The CONTRACTOR shall provide all pumps, piping, and other equipment to accomplish this task; perform all construction; obtain all permits; pay all costs; and perform complete restoration of all existing facilities to equal or better condition to the satisfaction of the OWNER.

##### 1.02 SUBMITTALS

- A. The CONTRACTOR shall submit a complete and detailed wastewater flow control plan to the OWNER for review, prior to commencing wastewater flow control work.

#### PART 2 - PRODUCTS

##### 2.01 PIPE FOR FLOW DIVERSION

- A. Ductile Iron Pipe: Ductile Iron Pipe and Fittings is acceptable for use for flow diversion during construction.
- B. Polyethylene Pipe: Polyethylene material shall comply with the requirement for Type III polyethylene, C-5 and P-34 as tabulated in ASTM D-1248 and have the Plastic Pipe Institute recommended designation pe3406. The material shall also have an average specific base resin density of between 0.94 g/cc and 0.955 g/cc (ASTM D-1505). Pipe made from these resins must have a long-term strength (50 years) rating of 1,250 psi or more per hydrostatic design basis categories of ASTM d-2837. The polyethylene resin shall have an environmental stress crack resistance, condition C as shown in ASTM D-1693, to be greater than 500 hours 20% failure. All pipe shall be made from the manufacturer's own production of the same formulation shall be used. The polyethylene resin shall have an average melt flow index, condition E as shown in ASTM D-1238, not in excess of 0.25 g/10 min. Pipe shall be homogeneous throughout, and free of visible cracks, holes, foreign material, blisters, or other deleterious faults. Diameters and wall thickness shall be measured in accordance with ASTM D-2122. Pipe joining will be done by thermal butt fusion method in accordance with ASTM D-2657.
- C. Acrylonitrile-Butadiene-Styrene (ABS): ABS pipe shall comply with requirements of ASTM D-2751.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. All materials used for wastewater flow control shall be pre-approved by the Engineer prior to commencing wastewater flow control activities.
- B. When wastewater flow at the upstream manhole of the sewer section being repaired are above the maximum allowable requirements for television survey, or do not allow the proper sewer or manhole repair, the flows shall be reduced to the levels required by one of the following methods: manual operation of pumping stations by OWNER forces, by the CONTRACTOR plugging/blocking of the flows, or the CONTRACTOR pumping/bypassing of the flows as acceptable to the OWNER.
- C. In some applications, the wastewater flow may be plugged and contained within the capacity of the collection system. This shall only be done when it has been determined, that the system can accommodate the surcharging without any adverse impact.
- D. For the initial television inspection, before a liner is installed, the CONTRACTOR shall plug the sewer line completely. No flow, except infiltration/inflow, will be allowed at any time through the respective sewer line being recorded on the television survey.
- E. When sewer flow at the upstream manhole of the line being repaired, in the opinion of the OWNER, are too excessive to plug while the rehabilitation is being performed; the CONTRACTOR shall submit a written plan and pump/bypass the flow as acceptable to the OWNER.
- F. When existing sanitary sewers are required to be taken up, moved, or rebuilt, the CONTRACTOR, at his own expense, shall provide and maintain temporary outlets and connections for all private or public drains, sewer, and sewer outlets connected to or served by the sewers to be rebuilt, and where necessary, shall provide adequate pumping facilities; and shall maintain these services until such time as the permanent sewers and connections are built and in service at no cost to the owner.
- G. During construction, flows in sections of the existing sewer being rehabilitated by removal and replacement shall be accommodated by temporary flow diversion. Wastewater flow diversion shall be accomplished as specified in this section, unless otherwise shown on the Plans.
- H. In sections of the existing sewer being rehabilitated by laying a new line parallel to the existing sewer, the existing sewer may be used to accommodate the existing flow and no temporary flow diversion will be necessary if the existing sewer is not damaged or its use restricted by the CONTRACTOR'S operations.
- I. All pipe material utilized in wastewater flow diversion during construction shall be in good condition, and free of defects, and leaks. The CONTRACTOR at no cost to the owner shall replace any defective material. Upon completion of the job, pipe materials shall be removed from the site.

3.02 DEPTH OF FLOW

- A. In performing television inspection, joint testing, and/or sealing and other sewer rehabilitation work, the CONTRACTOR shall control the depth of flow in the sewer within the following guideline:

MAXIMUM FLOW DEPTH			
TELEVISION INSPECTION		JOINT TESTING AND SEALING	
PIPE SIZE	% PIPE DIA.	PIPE SIZE	% PIPE DIA.
6" - 10"	20	6" - 12"	25
12" - 24"	25	15" - 24"	30
27" or larger	30	27" or larger	35

- B. When sewer line flow, as measured in the first manhole upstream of the sewer segment being rehabilitated, exceed the maximum depth listed above or inspection of the complete pipe periphery is necessary for effective testing, sealing, or line work, the CONTRACTOR shall implement wastewater flow control methods at no additional cost to the OWNER.

3.03 PLUGGING AND BLOCKING

- A. The CONTRACTOR shall insert a sewer line plug into the line at a manhole upstream from the section being inspected or repaired. The plug shall be so designed that all or any portion of the flow can be released. During the survey portion of the operation, flows shall be shut off or reduced to within the maximum flow limits specified. If repairs are necessary, the flow shall be shut off or pumped/bypassed, as approved by the OWNER. Wastewater flow shall be restored to normal following completion of work within the subject sewer section.

3.04 PUMPING AND BYPASSING

- A. When pumping/bypassing is required, as determined by the OWNER, the CONTRACTOR will supply the necessary pumps, conduits and other equipment to divert the flow of sewage around the manhole section in which work is to be performed. The bypass system shall be of sufficient capacity to handle existing flows plus additional flow that may occur during periods of rain storms. The CONTRACTOR will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. A "setup" consists of the necessary pumps, conduits and other equipment to divert flow of sewage around a manhole section, from the start to finish of work performed in the manhole section.
- B. Pumps and equipment shall be continuously monitored by a maintenance person capable of starting, stopping, refueling and maintaining these pumps during the rehabilitation. If pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise to a minimum.

### 3.05 FLOW CONTROL PRECAUTIONS

- A. Surcharging Sewers. Where the raw sewage flow is blocked or plugged, sufficient precautions must be taken to protect the public health. No septic conditions shall be allowed due to CONTRACTOR'S operations. The sewer lines shall also be protected from damage. The following occurrences shall not be allowed:
1. No wastewater shall be allowed to back up into any home or buildings.
  2. No wastewater shall overflow any manholes, cleanouts, or any other access to the sewers.
  3. Users upstream of the repair area shall be able to use all their water and sewer utilities without interruption.
- B. If any of the above occur or are expected to occur, the CONTRACTOR shall provide bypass pumping to alleviate one or all of the conditions. Additionally, the CONTRACTOR shall observe the conditions upstream of the plug and be prepared to immediately start bypass, if needed. It is the CONTRACTOR'S responsibility to pay for all damage claims.
- C. Any sump pumps, bypass pumps, trash pumps, or any other type of pump which pulls wastewater or any type of material out of the manhole or sewer shall discharge the material into another manhole, or appropriate vehicle or container approved by the OWNER. Under no circumstance shall this material be discharged, stored, or deposited on the ground, swale, road, or open environment.
- D. The CONTRACTOR shall take appropriate steps to ensure that all pumps, piping, and hoses that carry raw wastewater are protected from traffic. Traffic control shall be performed in accordance with Section 01570 - Traffic Regulations and Maintenance of Traffic.
- E. In the event, during "Wastewater Flow Control," that raw wastewater is spilled, discharged, leaked, or otherwise deposited in the open environment, due to the CONTRACTOR'S work, the CONTRACTOR shall be responsible for any cleanup of solids and stabilization of the area affected. This work shall be performed at the CONTRACTOR'S expense with no additional cost to the OWNER. The CONTRACTOR shall also be responsible for notifying the sewer system maintenance personnel and complying with any and all regulatory requirements for cleaning up the spill at no additional cost to the OWNER.
- F. During wastewater flow control operations, the CONTRACTOR shall take proper precautions to prevent damage to existing sanitary sewer facilities, flooding, or damage to public or private property.
- G. The CONTRACTOR shall be responsible for the removal of any debris sedimentation in the existing sewers, laterals, and manholes, etc., which is attributed to his work under this Contract.
- H. The CONTRACTOR shall perform all operations in strict accordance with OSHA regulations and any applicable local safety requirements. Particular attention is directed to safety regulations for excavations and entering confined spaces.



- I. It is the CONTRACTOR'S responsibility to notify in writing any property owner having a sewer service connection on the sewer being rehabilitated or replaced that such work is being performed. The CONTRACTOR shall notify property owner's 48 hours prior to commencing sewer rehabilitation or replacement. The Contractor shall be solely responsible for any damage caused by property service connection and backups caused by the sewer rehabilitation operations.

END OF SECTION

## SECTION 02752

### TELEVISION SURVEY

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. The work consists of furnishing all labor, materials, accessories, equipment, tools, transportation, services and technical competence for performing all operations required to execute the internal closed circuit television survey to inspect the entire barrel of sewers up to 36 inches in diameter and sewer laterals.
- B. The survey shall show all defects and determine amount of infiltration entering the sewer system.
- C. Prior to any testing, all lines and laterals shall be cleaned of debris and cleaned of tuberculation through mechanical removal and flushed clean. Debris shall be caught and removed from the lines and laterals and shall not be flushed into existing live sanitary sewers.

##### 1.02 GENERAL

- A. After cleaning as specified in the Contract Documents and after rehabilitation operation/replacement work, the pipe sections shall be visually surveyed by means of closed-circuit television in the presence of the OWNER. The survey shall be performed one manhole-to-manhole section or one lateral at a time and the flow in the section being surveyed shall be suitably controlled as described in the Contract Documents.
- B. Post-construction survey video on CD\_ROM shall be delivered to the OWNER on a "one line per CD-ROM" or a "one line per CD-ROM" basis, accompanied with the corresponding work order, and post-TV log, for each sewer line or lateral surveyed. The video on CD-ROM shall be direct form a live video source into video file, format MPEG1.

##### 1.03 EQUIPMENT

- A. The television camera used for the survey shall be one specifically designed and constructed for such survey and shall be of the pan and tilt type (minimum pan of 270 degrees and rotation of 360 degrees). Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing a minimum 700 line resolution color video picture. The CONTRACTOR shall maintain camera in clear focus at all times. Picture quality and definition shall be to the satisfaction of the OWNER; and if unsatisfactory, equipment shall be removed and replaced with adequate equipment at no additional cost to the OWNER.
- B. The video camera shall include a title feature capable of showing on the tape the following information:
  - 1. City and State

2. Date/Time
3. CONTRACTOR's Name
4. Line Size, Material, and Depth
5. Manhole Identification (both manholes) and direction of video
6. Lateral identification.
7. On-going Footage Counter

#### 1.04 SUBMITTALS

- A. The CONTRACTOR shall submit shop drawings and other information in accordance with the Contract Documents. The CONTRACTOR's submittals shall include description of the software to be used and a sample of the video titles to be used, along with a sample of the television survey log to be used.

#### PART 2 - PRODUCTS

Not Applicable

#### PART 3 - EXECUTION

##### 3.01 SURVEY

- A. Procedure
  1. After the work has been completed, the entire sewer line (from manhole to manhole) or lateral shall be televised. The camera shall be placed at the center of the manholes and laterals and videotaping shall commence prior to entering the pipe. The CONTRACTOR shall show the inside of the manhole walls and the pipe connection to the wall at both the upstream and downstream manhole.
  2. The camera shall be moved through the lines and laterals in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case shall the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, powered rewinds and tractors or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If the camera is being pulled through the sewer line by a hydraulic cleaning unit hose, the cleaning nozzle shall be located a minimum of eight (8) feet away from the camera to allow a clear, unobstructed view. Jet nozzle shall be used in front of camera while televising through a dip to draft out water. If, during the survey operation, the television camera will not pass through the entire manhole section, the CONTRACTOR shall set up his equipment so that the survey can be performed from the opposite manhole. In addition the CONTRACTOR shall stop camera at all point repairs, sectional repairs, and reinstated laterals, and inspect entire repaired pipe section.

3. Whenever non-remote powered and controlled winches are used to pull the television camera through the line and lateral, telephones or other suitable means of communication shall be set up between the two manholes of the section being surveyed to insure good communications between members of the crew.
- B. Measurement for location of defects shall be above ground by means of a meter device. Marking on the cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Measurement meters shall be accurate to tenths of a foot over the length of the section being surveyed. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, electronic distance meter or other suitable device. Manhole numbers and linear footage shall be shown on screen during taping.
- C. Field Documentation
1. Television Inspection Forms (Survey Logs). Printed and electronically stored location records shall be kept by the CONTRACTOR and will clearly show the location in relation to an adjacent manhole of each infiltration point observed during survey. Upstream footage at face of manhole (0) and downstream footage at face of manhole (e.g. 2500 shall be shown on the log. The television inspection forms to be utilized by the CONTRACTOR shall be those mandated by NASSCO's (National Association of Sewer Survey Companies) PACP (Pipe Line Assessment and Certification Program). Both the "Header" and "Details" information of the form shall be entered as indicated in the PACP standards. The survey logs shall include, but not be limited to the following information:
    - a. Correct pipe segment/manhole numbers/lateral identification
    - b. Correct address of manhole/lateral location
    - c. Pipe/Lateral size, length and material
    - d. Manhole depth (up and downstream)
    - e. Lift station service area number
    - f. CD number and index
    - g. Footage locations, descriptions and estimated leak rates for visible point sources of infiltration inflow.
    - h. Footage locations and descriptions of structural defects such as obstructions, any remaining root intrusion, offset joints, cracked pipe, fractured pipe, holes, collapses, sags, protruding service connections and/or blockages in the pipe.
  2. The terminology to be used shall follow NASSCO's PACP standards. All information will be recorded and a copy of such electronic records and a hard copy will be supplied to the OWNER.
  3. Photographs. Digital photographs of the television picture of problems shall be taken by the CONTRACTOR upon request of the OWNER.

4. Video Recordings. The purpose of video (CD-ROM) recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. CD-ROM recording playback shall be at the same speed that it was recorded. Slow motion or stop motion playback features shall be supplied by the CONTRACTOR. Once recorded, the CD-ROM becomes property of the OWNER. The CONTRACTOR shall have all CD-ROM and necessary playback equipment readily accessible for review by the OWNER during the Project.

END OF SECTION

## SECTION 02760

### SERVICE LATERAL TELEVISION SURVEY

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. The work consists of furnishing all labor, materials, accessories, equipment, tools, transportation, services and technical competence for performing all operations required to execute the internal closed circuit television survey to inspect the sewer service laterals.
- B. The survey shall show all defects and determine amount of infiltration entering the sewer system.
- C. Prior to any testing, all laterals shall be cleaned of debris, cleaned of tuberculation through mechanical removal and flushed clean. Debris shall be caught and removed from the lines and laterals and shall not be flushed into existing live sanitary sewers.

##### 1.02 GENERAL

- A. After cleaning as specified in the Contract Documents and any additional work that takes place, the pipe sections shall be visually surveyed by means of closed-circuit television in the presence of the OWNER. The survey shall be performed one lateral at a time and the flow in the section being surveyed shall be suitably controlled as described in the Contract Documents.
- B. Pre- and post-construction survey video on CD\_ROM shall be delivered to the OWNER on a "one line per CD-ROM" or a "one line per CD-ROM" basis, accompanied with the corresponding work order, and pre- and post-TV log, for each lateral surveyed. The video on CD-ROM shall be direct form a live video source into video file, format MPEG1.

##### 1.03 EQUIPMENT

- A. The television camera used for the survey shall be one specifically designed and constructed for such survey and shall be of the pan and tilt type. A Sonde locating device shall be attached to the camera. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. Then camera shall be operative in 100% humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing a minimum 700 line resolution color video picture. The CONTRACTOR shall maintain camera in clear focus at all times. Picture quality and definition shall be to the satisfaction of the OWNER; and if unsatisfactory, equipment shall be removed and replaced with adequate equipment at no additional cost to the OWNER.
- B. The camera system shall be able to inspect 4- and 6-inch lateral connections up to 70 feet from the sewer mainline. The launcher shall be mounted on a tread tractor that moves through main sewers and positions the inspection camera launcher opposite the lateral line connection.
- C. The camera system shall have mini black and white or color, fixed position, "positioning" camera to observe and place the mini color, push, "inspection" camera at the lateral. The

inspection camera shall be attached to an 80-foot long push cable with a fiberglass rod core for cable rigidity. The camera head shall point forward while traveling through the sewer mainline.

- D. The camera used from a cleanout shall be able to be launched from the cleanout and travel down to the sewer mainline, up to 100 feet. The camera shall be able to inspect 4- and 6-inch lateral connections.
- E. A Sonde shall be provided for locating unmarked sewer laterals. A sonde is a transmitter tied on a line and moved through a sewer or duct. A receiver on the surface follows its movement, documenting the line location. The pipe position is then marked on the ground. The sonde is pushed farther into the pipe, the receiver relocates the sonde and the pipe position is marked again. This process is repeated until the desired section of pipe is traced. It is pulled out on completion of the locate. The sonde will be inserted into the lateral through a sewer cleanout or, in case of no cleanout, through a roof vent to locate the cleanout as well as unmarked sewer lateral. The sonde may also be attached to the lateral television camera.
- F. The video camera shall include a title feature capable of showing on the tape the following information:
  - 1. City and State
  - 2. Date/Time
  - 3. CONTRACTOR's Name
  - 4. Line Size, Material, and Depth
  - 5. Manhole Identification (both manholes) and direction of video
  - 6. Lateral identification.
  - 7. On-going Footage Counter

#### 1.04 SUBMITTALS

- A. The CONTRACTOR shall submit shop drawings and other information in accordance with the Contract Documents. The CONTRACTOR's submittals shall include description of the software to be used and a sample of the video titles to be used, along with a sample of the television survey log to be used.

#### PART 2 - PRODUCTS

Not Applicable

## PART 3 - EXECUTION

### 3.01 SURVEY

#### A. Procedure

1. Prior to any repair work, the entire service lateral (from mainline to property line/cleanout, whichever is farther from the mainline) shall be televised.
2. Measurement for location of defects shall be above ground by means of a meter device. Measurement meters shall be accurate to tenths of a foot over the length of the section being surveyed. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, or other suitable device. Linear footage shall be shown on screen during recording.
3. Movement of the television camera shall be temporarily halted for a minimum of ten seconds at each visible point of flow until the source and flow rate from that point are determined.
4. The inspection shall be performed from either the main sewer or the cleanout with proper equipment specified. If the CONTRACTOR chooses to perform the inspection from the cleanout and the cleanout is either inaccessible or does not exist, he shall install a cleanout to facilitate the inspection. All costs of material, equipment, labor, and other costs due to unspecified field conditions shall be borne by the CONTRACTOR. Payment for cleanout installation shall be made by the OWNER as indicated in the Contract Documents.
5. Above ground horizontal location of lateral shall be marked every five (5) feet utilizing surveyor's paint on asphalt or concrete surface and surveyor's flags in grass. Approximate depth of laterals at these locations shall be recorded on TV logs.

#### B. Field Documentation

1. Television Survey Logs: Location of the lateral by indicating the upstream manhole number, distance from the upstream manhole, lateral connection to the mainline (left, center or right), and address of the customer serviced by the lateral, shall be noted on the television survey log. Printed and electrically stored location records shall be kept by the CONTRACTOR and will clearly show the location, in relation to the cleanout or the mainline of each infiltration point observed during survey. Footage shall be shown on the log. In addition, other points of significance such as unusual conditions, roots, broken pipe, presence of scale and corrosion, and other discernible features will be recorded and a copy of such records will be supplied to the OWNER. The CONTRACTOR shall measure the depth of the upstream and downstream manholes. Measurements shall be from the invert of the pipe to the top of the manhole rim and shall be recorded on the survey log.
2. Photographs: Digital photographs of the television picture of problems shall be taken by the CONTRACTOR upon request of the OWNER.



3. Video Recordings: The purpose of video (CD-ROM) recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. CD-ROM recording playback shall be at the same speed that it was recorded. Slow motion or stop motion playback features shall be supplied by the CONTRACTOR. Once recorded, the CD-ROM becomes the property of the OWNER. The CONTRACTOR shall have all CD-ROM and necessary playback equipment readily accessible for review by the OWNER during the Project.
4. Audio: All CD-ROM shall have audio record. As a preamble, at the beginning of the CD-ROM, the CONTRACTOR shall state the following: "(Contractor's Name) is performing a pre/post TV survey for Job No. \_\_\_\_\_ (provided by the OWNER), Miami-Dade County". Start date, time, operator's name, area, pipe size and material, upstream manhole number and depth. The CONTRACTOR shall verbally state the position of the lateral with respect to the upstream manhole and describe defects. At the end of each line, state: "End of line" and total linear footage.

### 3.02 LOCATION OF LATERAL FROM RESIDENCE

#### A. Procedure

1. Run a sonde to locate cleanout as well as unmarked sewer lateral. A sonde is a transmitter tied on a line and moved through a sewer or duct. A receiver on the surface follows its movements, documenting the line location. The pipe position is then marked on the ground. The sonde is pushed farther into the pipe, the receiver relocates the sonde and the pipe position is marked again. This process is repeated until the desired section of pipe is traced. It is pulled out on completion of the locate.

#### B. Documentation

1. Above ground horizontal location of lateral shall be marked every five (5) feet utilizing surveyor's paint on asphalt or concrete surface and surveyor's flags in grass. Approximate depth of laterals at these locations shall be recorded on the TV logs. Location of buried cleanouts or location for the purposes of installing a new cleanout shall be marked by two measured distances to permanent recoverable objects. CONTRACTOR shall furnish a schematic of these locations with sufficient detail to be able to relocate from above ground, at a later date.

END OF SECTION

## SECTION 02762

### TEMPORARY WASTEWATER

#### ULTRASONIC FLOW MEASURING SYSTEM

##### PART 1 - GENERAL

###### 1.1 SUMMARY

Provide an ultrasonic flow meter for temporary installation on the wastewater piping system. The meter shall use a transit time ultrasound signal to measure the volume flow and generate a real time fraction measurement of wastewater flow.

###### 1.2 SUBMITTALS

- A. Furnish complete Product Data, Operating Manuals, Manufacturer's Certifications, Sample Calibration sheets, and (where available and appropriate) Manufacturer's Reports and Test Reports.
- B. Product Data:
  - 1. Measurement accuracy.
  - 2. Range and range ability.
  - 3. Classification Rating.
  - 4. Calibration certificates.
  - 5. Power:
    - Voltage.
    - Wattage.
  - 6. Output options.

###### 1.3 QUALITY ASSURANCE

- A. Manufacturer instruments facilities certified to the quality standards of ISO Standard 9001 - Quality Systems - Model for Quality Assurance in Design/Development, Production, Installation, and Servicing.
- B. The ultrasonic flow sensor will be flow calibrated against an accredited ISO- 17025 flow test stand on fluids with certified accuracy traceable to NIST.

###### 1.4 PROJECT OR SITE CONDITIONS

Provide instruments suitable for the installed site conditions including, but not limited to, material compatibility, process and ambient temperature and pressure, and humidity conditions.

## 1.5 MAINTENANCE

Provide all parts, necessary for maintenance and calibration purposes throughout the period of use on this project.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURED UNITS

- A. Measurement fluid: Uniform liquid in which ultrasonic waves can propagate.
- B. Turbidity of fluid: 10000 mg/L or less State of fluid: Well-developed turbulent or laminar
- C.. The work will include the installation and maintenance of flow monitors and rain gauges for a period of seven (7) days during the wet season. The CONTRACTOR shall be responsible for installing and maintaining equipment and collecting, analyzing and reporting findings. The major work items include:
  - 1. Recommendations for flow monitoring and rainfall gauge locations and site data sheets for each site investigated,
  - 2. Installation and maintenance of equipment including calibration and confirmations, Processing of data and production of reports to include tables, hydrographs and scatter graphs of depth, velocity, flow and rainfall data,
  - 3. QA/QC checks of field and office procedures with supporting documentation
  - 4. Final report presenting an analysis of the data and findings/recommendations, description of the project, equipment, field procedures, data processing procedures and all data.
- D. Equipment Requirements
  - 1. Flow Monitoring Equipment
  - 2. Rainfall Gauge Equipment

Rain gauge equipment shall be tipping bucket style capable of recording 0.01 inch increments and equipped with a data logger to allow remote, automatic collection of data.

END OF SECTION