

## SECTION 810

### SEWER LINE CLEANING

#### I. GENERAL

##### 1.1 DESCRIPTION OF WORK

The work covered by this section consists of providing all labor, equipment, material, supplies, incidentals, and performing all operations required to clean sewer lines and manholes prior to the internal television inspection(s) and repair operations.

- A. **Sewer Line Cleaning:** The intent of sewer line cleaning is to remove foreign materials from the pipes to prepare the lines for television inspection and repair operations. Since the success of other phases of work depends on the cleanliness of the lines, the importance of this phase of the operation is emphasized. 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 shall not be required to clean those specific sewer sections. Immediately upon discovery of conditions that prevent cleaning the Contractor shall notify the Owner of such conditions. If, in the course of normal cleaning operations, damage does result from pre-existing and unforeseen conditions such as broken pipe, the Contractor shall not be held responsible for the damages.
- B. **Manhole Cleaning:** The intent of manhole cleaning is to provide a Concrete Surface Profile (CSP) meeting International Concrete Repair Institute (ICRI) guidelines per the Contract Documents, for subsequent rehabilitation. All concrete and masonry surfaces must be clean prior to repair or rehabilitation. Grease, laitance, loose bricks, mortar, unsound concrete and other deleterious materials must be completely removed. Water blasting (minimum 1200 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. **Disposal of Materials:** All waste materials, including but not limited to excavated materials, demolished pavement, arboreal (landscaping) waste and other debris, that are not suitable for project related purposes (e.g., backfill) or are surplus to the needs of the project, all as determined by the Owner, shall become the property of the Contractor. The Contractor shall dispose of all such material in accordance with the approved Disposal Plan and all local, State, and Federal regulations at no additional cost to the Owner. See also Part 1.2 below.

##### 1.2 SUBMITTALS

Submittals shall be made by the Contractor in accordance with the procedures set forth in Section 105 - Control of Work, and as described below.

- A. The Contractor shall submit a Disposal Plan for preview and acceptance by the Owner prior to performing any work that might generate waste materials. The plan shall include a complete description of the materials that are expected to be encountered and their proposed disposal

- site(s). The Contractor may change his Disposal Plan only by written notice to the Owner. The acceptance of a plan and/or any related notice to the Owner must be evidenced by a written response from the Owner.
- B. The Contractor shall ensure that all permits related to his disposal operations have been obtained and the Contractor shall comply with all requirements of those permits. The Contractor shall show evidence that all required permits have been obtained for all disposal sites by submitting a copy of all such permits to the Owner as part of the Contractor's Disposal Plan. Expenses related to the disposal plan and related disposal activities, including debris disposal, shall be considered incidental.
  - C. The Contractor shall submit to the Owner copies of records of all disposals resulting from cleaning operations.
  - D. All protection of public and private property, environmental controls, safety, and other impacts to the Work and adjacent property shall be in accordance with Section 107 - Legal Relations and Responsibility to the Public, and as may be further specified herein.
  - E. The Contractor shall submit clarification in writing that backup equipment for sewer system cleaning is available and can be delivered to the site within 24 hours. Bypass pumping operations, should they be required, shall be in accordance with Section 812 - Bypass Pumping.
  - F. The Contractor shall contact HRSD's Pretreatment and Pollution Prevention Manager at 757-460-7048 and obtain written approval of any chemicals used to remove roots. Contractor shall provide proof of such approval by HRSD to the Owner prior to chemical root treatment.

## **II. EXECUTION**

### **2.1 GENERAL**

- A. Satisfactory precautions shall be taken to protect the sewer lines from damage that might be inflicted by the improper use of cleaning equipment. Sewers and manholes damaged as a result of the Contractor's improper operations shall be promptly repaired by the Contractor in a manner approved by the Owner, at no cost to the Owner.
- B. All equipment, devices, and tools required for this Contract shall be owned or leased and operated by the Contractor.
- C. Cleaning Equipment

It is at the Contractor's discretion which type of equipment will be used for cleaning of sewers and manholes; however, the equipment may be subject to approval by the Owner.

- 1. Rodding: The Contractor shall provide all mechanically powered equipment necessary for proper rodding, bucketing, brushing, root cutting and flushing of the sewers in the pipe sizes indicated in the Contract Documents. The equipment used for cleaning shall be that of a heavy-duty power rodding machine capable of rodding distances of up to 1,000 feet in one setup. It shall have the ability to spin the rod either clockwise or counterclockwise, be able to be pushed straight out or pulled back without rotating the machine. It shall also be capable of pulling pipe-size swabs or brushes back through the pipeline for cleaning and flushing purposes.

2. Bucket Machine: The Contractor shall also provide heavy-duty bucket machines, as necessary, for use on dragline work to clean the pipeline with buckets, brushes, scrapers, swabs or other similar devices to effectively remove the debris and provide a clean sewer for the inspection.
3. Hydraulic Flusher: Hydraulic high-pressure sewer cleaners used for cleaning shall be specifically designed and constructed for such cleaning. The sewer cleaner shall have a minimum usable water capacity of 600 gallons and a pump capable of delivering at least 30 gallons per minute (gpm) at 100 psi. Pressure to the nozzle shall be regulated by a relief valve adjustable from 1 to 1500 psi minimum.
4. 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 floor. 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.
5. Pigging: The hydraulically propelled equipment used shall be 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 cleansed 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 are used, special precautions to prevent flooding of the sewers and public or private property shall be taken.
6. The Contractor shall utilize CCTV equipment as necessary to facilitate observing the jetting, cleaning, and or root cutting of the sewer and be able to observe and document that the cleaning meets the intent of the Contract Documents. The Contractor shall document the amount of debris before cleaning and not just supply a final video and Pipeline Assessment and Certification Program (PCAP) data of the post-cleaning condition.

## 2.2 CLEANING OPERATIONS

### A. General

1. Approval for potable water withdrawal from hydrants must be obtained from the Water System Owner prior to any cleaning operations. Any costs for such approval and delivery/disposal of such potable water shall be borne by the Contractor.
2. The specific project sections shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. 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 sewer 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 pipeline section, it will be assumed that a major blockage exists and the cleaning effort shall be abandoned.

3. Cleaning shall be performed prior to lining of the sewer. When the sewer is to be lined the Contractor shall perform sewer cleaning work to an acceptable level and perform a thorough television inspection of the sewer. An acceptable level is defined as the removal of all debris, or enough debris to restore a minimum of 95 percent of the internal pipe diameter throughout the pipe segment cleaned. If the pipe condition is such that cleaning may cause a potential collapse then the pipe shall be televised without attempting to clean it to the 95 percent condition, pending approval by Owner. Television inspections shall be performed in accordance with Section 811 – Television Inspection.
4. Existing flows shall not be interrupted for periods longer than necessary, or as specified in Section 110 - Special Provisions. The Contractor shall take necessary precautions to prevent sewage backup and shall be responsible if damage results there from. Sewage diverted during cleaning operations shall be returned to the sanitary system and not discharged into any surface water body or storm drain system.
5. Debris accumulated during cleaning operations shall be removed from the sewer pipes and manholes and properly disposed of in accordance with the approved Disposal Plan.
6. Cleaning shall be performed from upstream to downstream within each pipe run unless otherwise approved by the Owner.
7. The Contractor shall provide appropriate screening to stop passing of materials into downstream sewers. All solid or semisolid materials dislodged during cleaning operations shall be removed from the sewer by the Contractor at the downstream manhole of the pipe run being cleaned. These materials shall become the property of the Contractor, shall be removed from the site at the end of each workday and be disposed of in accordance with the approved Disposal Plan.
8. The passing of dislodged materials downstream of the sewer being cleaned shall not be permitted. In such an event, as observed or detected by the Owner or any party, the Contractor shall be responsible for cleaning the affected downstream sewers in their entirety, at no additional cost to the Owner.

**B. Cleaning Precautions**

1. During all cleaning and preparation operations, all necessary precautions shall be taken to protect the sewer pipe and manholes from damage. During these operations precautions shall also be taken to ensure that no damage is caused to public or private property adjacent to or served by the sewer or its branches in accordance with Section 107 - Legal Relations and Responsibility to the Public. Any damage caused to public or private property as a result of such cleaning, preparation or other Contractor operations shall be restored to pre-existing conditions at the sole expense of the Contractor.
2. Satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools or tools which retard the flow in the sewer line are used, precautions shall be taken to insure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. When possible the flow of sewage 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.

3. Access to fire hydrants for the purpose of fire protection shall be maintained at all times.
4. Ingress and egress to public and private property shall not be impeded.

#### C. Root Removal

1. Roots shall be removed in the designated sewer sections and manholes where root intrusion is a problem and where authorized by the Owner. Special attention should be used during the cleaning operation to ensure complete removal of roots from the joints.
2. Any roots which could prevent the proper seating and application of the rehabilitation product shall be removed. Procedures may include, but are not limited to, the use of equipment that can be operated remotely, mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupine, and equipment such as high-velocity jet cleaners.
3. Chemical root treatment shall be used before or following the root removal operation, depending on the manufacturer's recommendation. Contractor shall capture and remove all roots from the line at the downstream manhole.

#### D. Chemical Root Treatment

To aid in the removal of roots, pipeline sections that have root intrusion shall be treated with an herbicide approved by HRSD. The active ingredients shall have no adverse effect on the performance of the wastewater treatment processes and shall be registered with the Environmental Protection Agency. Products containing metam sodium are expressly prohibited. The Contractor shall contact HRSD's Pretreatment and Pollution Prevention Manager at 757-460-7048 and obtain written approval of any chemicals used to remove roots. The application of the herbicide to the roots shall be done in accordance with the manufacturer's recommendations and specifications in such a manner to preclude damage to surrounding vegetation. Any damaged vegetation so designated by the Owner shall be replaced by the Contractor at no additional cost to the Owner. All safety precautions as recommended by the manufacturer shall be adhered to concerning transporting, handling, and application of the herbicide.

#### E. Material Removal and Disposal

1. All sludge, dirt, sand, rocks, grease, roots, and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. When hydraulic cleaning equipment is used a suitable dam or weir shall be placed in the downstream manhole to trap all such materials. Passing material from pipeline section to pipeline section shall not be permitted.
2. Under no circumstances shall sludge or other debris removed during these operations be dumped or spilled into streets, ditches, storm drains or other sanitary sewers. All solids or semisolids resulting from the cleaning operations shall be removed from the

site and disposed of by the Contractor in accordance with the approved Disposal Plan. Copies of records of all disposals shall be furnished to the Owner indicating disposal site, date, amount, and a brief description of material disposed. All materials shall be removed from the site no less often than the end of each workday. Under no circumstances will the Contractor be allowed to accumulate debris, etc., on the site of work beyond the stated time except in totally enclosed containers and as acceptable to the Owner. 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 as specified in the approved Disposal Plan.

3. 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 accordance with applicable laws and regulations. The Contractor shall immediately clean up any such spill or waste. If the Contractor fails to clean up such spill or waste immediately, the Owner shall have the right to clean up or arrange for its cleanup and shall charge to the Contractor all costs, including administrative costs and overhead incurred by the Owner, in connection with such cleanup. The Owner shall also charge the Contractor any costs incurred or penalties imposed on the Owner as a result of any spill, dump or discard.
4. The general requirements for vehicles hauling such waste material are as follows:
  - Transport vehicles must be of type(s) approved for this application by the political jurisdictions involved.
  - Vehicles must have watertight bodies and be properly equipped and fitted with seals and covers to prohibit material spillage or drainage.
  - Vehicles must 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.
5. 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.

#### F. Acceptance of Cleaning Operation

1. In support of Rehabilitation Activities: Acceptance of sewer line cleaning shall be deemed sufficient when pipe is clean enough for installation of the particular rehabilitation method, in accordance with manufacturer's recommendations, and the Owner's approval.

CCTV inspection shall be performed immediately following cleaning of the line and in no case more than 1 hour later. If the television 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, at the Contractor's expense.
2. Sewer Cleaning Only: Acceptance of sewer line cleaning shall be when a minimum amount of debris is observed being removed from the sewer section.

### **III. MEASUREMENT FOR PAYMENT**

All sewer cleaning efforts shall require documentation, satisfactory to the Owner, of all quantities and types of materials removed during cleaning.

#### **A. Light Cleaning Only**

Sewer reaches that do not require heavy cleaning, as defined below, and that produce little or no debris shall be categorized as “light cleaning”.

Light cleaning will be paid on the basis of cost per linear foot for up to 3 passes

#### **B. Light Cleaning With CCTV**

Sewer reaches that do not require heavy cleaning, as defined below, and that produce little or no debris shall be categorized as “light cleaning”. Costs related to the cleaning of such sewers shall include post cleaning CCTV.

Light cleaning will be paid on the basis of cost per linear foot for up to 3 passes

#### **C. Heavy Cleaning Only**

Sewer reaches that require debris removal of depths up to 25 percent of the pipe height shall be categorized as “heavy cleaning”.

Heavy cleaning will be paid for cleaning in addition to light cleaning (3 passes) paid at the cost per linear foot. No payment will be made until disposal tickets for debris removed and disposed of are submitted.

Compensation for heavy cleaning will only be paid if:

1. The heavy cleaning was authorized by the Owner prior to Contractor performance of the Work;
2. Payment for heavy cleaning on a per foot basis shall be from the downstream manhole to the location at which heavy cleaning is required.

#### **D. Heavy Cleaning With CCTV**

Sewer reaches that require debris removal of depths up to 25 percent of the pipe height shall be categorized as “heavy cleaning”. Video proof of heavy cleaning shall be obtained by acquiring a “before” video of all accessible portions of the obstructed reach and submitting that to Owner along with the completed inspection. A submerged camera does not justify a need for heavy cleaning. Proof that the submergence was due to a blockage and/or heavy debris and not a sag in the line will be required.

Heavy cleaning will be paid for cleaning in addition to light cleaning (3 passes) paid at the cost per linear foot. No payment will be made until disposal tickets for debris removed and disposed of are submitted. Costs related to the cleaning of such sewers shall include post cleaning CCTV and all contingent items.

Compensation for heavy cleaning will only be paid if:

1. The heavy cleaning was authorized by the Owner prior to Contractor performance of the Work;
  2. Payment for heavy cleaning on a per foot basis shall be from the downstream manhole to the location at which heavy cleaning is required.
- E. Pipes that contain roots and/or debris depths greater than 25 percent of the pipe height may be paid on a time and material basis, upon approval by Owner. The Owner may determine any individual pipe be cleaned on a time and material basis.
- F. Descaling Only
- The removal of iron oxide deposits (descaling) on the interior of ductile or cast iron pipes, requiring the use of equipment not typically used for cleaning operations, will be paid for on a per foot basis, including all contingent items.
- G. Descaling with CCTV
- The removal of iron oxide deposits (descaling) on the interior of ductile or cast iron pipes, requiring the use of equipment not typically used for cleaning operations, will be paid for on a per foot basis, including all contingent items. No payment will be made until post cleaning CCTV is completed and approved by the Owner.
- H. Debris from line cleaning removed from manholes will be considered incidental to pipeline cleaning.
- I. When manhole cleaning includes complete cleaning of the walls and channels (roots, grease, debris, etc.), measurement and payment will be made per each manhole cleaned or per vertical foot (VF) as indicated on the Bid form.

End of Section