



SECTION 02540 SEWER CLEANING

PART 1. GENERAL

1.01 SCOPE

- A. This section covers the Cleaning of sewers to remove all debris, solids, sand, grease, grit, roots, etc. from the sewers and manholes to improve pipe flow, facilitate television inspection for sewer evaluation, for proper application of root control chemical, or as required for other specified rehabilitation.
- B. The Work covered by this section includes furnishing all labor, equipment, and materials required to clean and inspect sanitary sewer lines as specified.

1.02 SUBMITTALS

- A. Action Submittals: Catalog and manufacturer's data sheets for cleaning equipment.
- B. Informational Submittals:
 - 1. Sample of the finished picture from the picture capture system.
 - 2. Equipment manufacturer's operational manual and guidelines.
 - 3. Liquid Waste Manifest.

PART 2. PRODUCTS

2.01 EQUIPMENT

- A. Sewer television equipment shall be in compliance with Section 02541, Sewer Television Inspection.
- B. 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.
- C. High-Velocity Jet (Hydro-cleaning) Equipment:
 - 1. 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 and produce at least 2,000 psi pressure. The gun shall be capable of producing flows from a fine spray to a solid stream.

2. Sewer line cleaning equipment shall be a combination of high-velocity (hydro-cleaning) jet and vacuum system, truck-mounted for mobility and ease of operation. The hydro-cleaning equipment for sewer lines shall include a minimum 1,000-gallon water storage tank, auxiliary engines and pumps, and include a minimum of 600 feet of 1-1/4-inch I.D. high-pressure hose on a power driven hose reel. Pump nozzle combinations shall be capable of producing water flow rates up to 120 gpm, and a minimum of 60 gpm at a working pressure up to 2,000 psi. The vacuum system shall be a positive displacement blower with a minimum of 4,200 cfm at 15 inches of mercury. OWNER must approve any variations to this pumping rate, in advance.
3. A working pressure gauge shall be used on the discharge of all high-pressure water pumps.
4. CONTRACTOR shall use in addition to conventional nozzles, a nozzle which directs the cleaning force to the bottom of the pipe for sewers 18-inch and larger.

- D. Mechanically Powered Equipment: Bucket machines 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. A 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 insure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.

PART 3. EXECUTION

3.01 GENERAL

- A. Prior to the start of any Work under this project, CONTRACTOR shall make available to OWNER all equipment that is to be utilized in the execution of this contract. OWNER will hold a preconstruction conference at which the sequence of work, methods, inspection, and monitoring requirements and debris disposal shall be discussed.
- B. When sewer flow depth is greater than 25 percent, flow depth must be decreased by plugging or bypass pumping. Plugs shall be designed to pass any desired portion of sewage flow. If bypass pumping is required, CONTRACTOR shall provide all necessary equipment, manpower, and expertise. CONTRACTOR is



responsible for all damage to public or private property resulting from these operations.

- C. Designated sanitary sewers and manholes shall be cleaned using mechanical hydraulically propelled or high velocity sewer cleaning equipment. The cleaning process shall remove all grease, roots, sand, silt, solids, rags, debris, etc. from each sewer segment, including the manhole(s).
- D. Selection of cleaning equipment and the method for cleaning shall be based on the condition of the sanitary sewer mains at the time Work commences and will be subject to DESIGN ENGINEER'S approval.
- E. All cleaning equipment and devices shall be operated by experienced personnel.
- F. Satisfactory precautions shall be taken to protect the sanitary sewer mains and manholes from damage that might be inflicted by the improper use of the cleaning process or equipment. Any damage done to a sewer by CONTRACTOR shall be repaired by the CONTRACTOR at no additional cost to OWNER and to the satisfaction of DESIGN ENGINEER.
- G. Cleaning shall also include the initial manhole wall washing by high-pressure water jet.
- H. CONTRACTOR, when instructed by DESIGN ENGINEER, will be required to demonstrate the performance capabilities of the cleaning equipment proposed for use on the Project. If the results obtained by the proposed sanitary sewer cleaning equipment and/or attachments are not satisfactory, CONTRACTOR shall use different equipment/attachments, as required, to meet Specifications. More than one type of equipment/attachments may be required at a location.
- I. When hydraulic or high velocity cleaning equipment is used, a suitable sand trap, weir, dam, or suction shall be constructed in the downstream manhole in such a manner that all the solids and debris are trapped for removal.

3.02 HYDRAULIC CLEANING

- A. Prior to televising, CONTRACTOR shall thoroughly clean the pipelines of debris, grease, roots, sediment, broken pipe, or other obstructions that could retard the movement of the television camera. Precautions shall be taken to protect the sewer lines being cleaned from damage by the cleaning equipment.
- B. Hydraulically propelled devices, which require a head of water to operate, must utilize a collapsible dam. The dam must be easily collapsible to prevent damage to the sewer, property, etc.

- C. When using hydraulically propelled devices, precautions shall be taken to insure that the water pressure created does not cause damage or flooding to public or private property.
- D. CONTRACTOR shall not increase the hydraulic gradient of the sanitary sewers beyond the elevation that could cause overflow of sewage into area waterways or into structures.

3.03 HIGH-VELOCITY CLEANING

- A. CONTRACTOR shall operate the equipment so that the pressurized nozzle continues to move at all times.
- B. The pressure nozzle shall be turned off or water pressure be reduced anytime the hose is held or delayed in order to prevent damage to the line. In heavy debris the step cleaning method should be used.

3.04 MECHANICAL CLEANING

- A. Mechanical cleaning, in addition to normal cleaning when required by DESIGN ENGINEER, shall be approved equipment and accessories driven by power winching devices.
- B. All equipment and devices shall be operated by experienced operators in an effort to prevent pipe damage during the cleaning process.
- C. Buckets, scrappers, scooters, porcupines, kites, heavy duty brushes, metal pigs and other debris removing equipment/accessories shall be used as appropriate and necessary in the field, in conjunction with the approved power machine(s).
- D. The use of cleaning devices such as rods, metal pigs, porcupines, root saws, snakes, scooters, sewer balls, kites and other approved equipment, in conjunction with hand winching device, and/or, gas, electric rod propelled devices, shall be considered normal cleaning equipment.

3.05 WATER USAGE

- A. Any and all OWNER water used by CONTRACTOR shall be from a metered supply with an approved backflow device to protect the water supply. All metered water supply shall be paid for to OWNER through the regular billing system.



- B. CONTRACTOR shall be responsible for obtaining transient water meter(s) from OWNER, which shall be installed on the trucks or at fire hydrant(s). All related charges for the set-up shall be considered incidental to the cleaning of the existing sanitary sewer mains.
- C. CONTRACTOR shall be responsible for preventing contamination of the potable water system. CONTRACTOR when drawing water from a public hydrant shall use a backflow preventer and/or an eighteen (18) inch air gap.
- D. No fire hydrant shall be obstructed or used when there is a fire in the area.
- E. It shall be CONTRACTOR's responsibility to obtain approval to use OWNER'S fire hydrants.
- F. CONTRACTOR shall remove the water meter(s)/piping etc. from all fire hydrants at the end of each working day.

3.06 REMOVAL AND DISPOSAL OF DEBRIS

- A. All materials removed from the sewer lines during cleaning operations shall be trapped and removed from the system at the downstream manhole of the section being cleaned. All materials shall be disposed of in compliance with all applicable laws and regulations and in a manner approved by OWNER.
- B. Passing of debris from upstream manhole section to downstream manhole section will not be allowed.
- C. All debris from the manholes shall be loaded into an enclosed container that is permitted by OWNER and the Tennessee Department of Environment and Conservation (TDEC) for liquid waste hauling.
- D. All solids or semi-solids resulting from the cleaning operations shall be removed from the site at the end of each workday, hauled to and disposed of at the Chestnut Ridge Landfill using OWNER-supplied permit.
- E. CONTRACTOR will pay landfill-tipping fee.
- F. CONTRACTOR shall not be allowed to accumulate debris, and/or liquid waste, sludge, etc. on the site except in totally enclosed containers approved by DESIGN ENGINEER.
- G. All waste shall be hauled to the disposal site by a transporter, which is arranged for by CONTRACTOR and holds a valid Liquid Waste Transporter Permit.

- H. CONTRACTOR shall submit and maintain a "Liquid Waste Manifest" as per OWNER and TDEC requirements. OWNER'S and TDEC's copies of the completed manifest shall be sent to DESIGN ENGINEER within 24 hours after the disposal of the waste materials.

- I. Under no circumstances shall sewage or solids removed in the cleaning process be dumped onto streets or into ditches, catch basins, storm drains, sanitary sewer manholes, cleanouts, or dumps.

END OF SECTION