

SECTION 336070

SEWER LINE AND MANHOLE CLEANING

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish all labor, materials, equipment and incidentals required to clean sewer pipe and fittings installed and/or rehabilitated, complete as shown on the Drawings and as specified herein.
- B. Cleaning shall include proper high pressure water jetting, rodding, bucketing, brushing and flushing of sewers and manholes prior to inspection by closed circuit television (CCTV), pipeline rehabilitation or replacement, point repairs, manhole preparation, and testing operations.
- C. Goal of cleaning is to remove debris, roots, intruding services, deposits, and other blockages to a minimum of 95 percent open. Contractor shall perform sewer cleaning work to an acceptable level as necessary to perform a thorough television inspection of sewer. If pipe condition is such that cleaning may cause a potential collapse, then pipe shall be televised without attempting to clean it to 95 or 98 percent condition, pending approval by the Engineer and Owner.

1.2 RELATED WORK

- A. Television Inspection is included in Section 336060
- B. Gravity Sewer System Smoke Testing in Section 336065
- C. Manhole Rehabilitation in Section 336080

1.3 SUBMITTALS

- A. Submit a safety plan prior to performing any on-site work that includes the following as a minimum:
 - 1. Confined Space Entry.
 - 2. Personal Protective Equipment.
- B. Closeout Documents: Submit one complete set of documentation regarding inspections and work performed. Based on work scope,

submit written reports, photographs taken, and USB flash drives that incorporate color video recordings.

1.4 QUALITY ASSURANCE

Contractor shall have a minimum of five years' experience in sewer line and underground structure cleaning. Submit a list of at least three customers who have had similar work completed. Furnish trained and qualified technicians with proper experience operating equipment that is being used on this project.

1.5 SYSTEM DESCRIPTION

A. [enter description of system for this project]

1.6 PROJECT/SITE REQUIREMENTS

A. Recording of Field Observations: Record video inspections in color on USB flash drives. Submit inspection report in Microsoft Access database format or Excel format and recorded onto USB flash drives. Original recordings and inspection reports shall become property of Owner. Observations shall include:

1. Television Inspection Logs: Each segment inspection shall have a separate inspection report that is recorded onto a USB flash drive, in a Microsoft Access or Excel format that shall be given to Owner for its use; also submit a paper copy of the report that is clear and concise to read. Clearly show location, in relation to adjacent manholes, of each source of infiltration/inflow discovered. In addition, other data of significance including locations of building and house service connections, along with an estimation of infiltration/inflow from such services, joints, unusual condition, roots, cracked or collapsed sections, presence of scale and corrosion, sewer line sections that the camera failed to pass through and reasons for failure and other discernible features shall be recorded.

2. Photographs: During CCTV inspection, stop camera at significant observations to ensure a clear and focused view of pipe condition. At this point, if video equipment has video printer capabilities for instantaneous photographs, take photographs of significant observations for use in inspection documentation report. If the video equipment does not have capabilities for instantaneous photographs, take digital photographs of monitor with significant observations on screen. Provide Owner with a USB flash drive that includes all photographs.

3. Digital Recordings: Purpose is to supply a visual and audio record of problem areas of sewer lines that may be replayed both daily and at future presentations by Owner. Digital recording playback shall be at

same speed that it was recorded. Slow motion or stop motion playback features shall be supplied at option of the Contractor. Recordings shall be in color. Contractor shall have USB flash drives and necessary playback equipment readily accessible for review by Owner during the project. At project completion furnish original recordings to the Owner. Contractor shall keep a copy of USB flash drives for 30 days after Substantial Completion, at which time the USB flash drives may be erased at Contractor's option.

- B. Traffic Control: Coordinate traffic control required to perform work of this Section with the City.

1.7 DEFINITIONS

- A. Light Cleaning: Small amounts of debris existing within sewer line and where sewer reaches do not require heavy cleaning, as defined below, and that produce little or no debris.
- B. Heavy Cleaning: Large deposits of debris or heavy root growth existing within sewer line and where sewer reaches require debris removal of depths up to 25 percent of pipe height.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- A. Hydraulic Sewer Cleaning Equipment:

1. Equipment used shall be of a movable dam type and be constructed so that a portion of the dam may be collapsed at any time during cleaning operation to protect against flooding of sewer. Movable dam shall be same diameter as pipe being cleaned and shall provide flexible scraper around outer periphery to ensure total removal of grease. If sewer cleaning balls or other such equipment which cannot be collapsed instantly are used, take special precautions against flooding of sewers and public or private property.

- B. High Velocity Jet (Hydrocleaning) Equipment:

1. Have a minimum of 500 feet of high pressure hose.
2. Have a selection of two or more velocity nozzles that are capable of producing a scouring action from 15 to 45 degrees in all size lines to be cleaned. Also include a high velocity gun for washing and scouring manhole walls and floor.
3. Be capable of producing a minimum of 80 gallons per minute flows from

a fine spray to a long distance solid stream and delivering up to 1,000 psi. Be able to carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel. Locate controls so equipment can be operated above ground. Select flowrates and pressures as required for each size of sewer, type of debris, and amount of debris, and as recommended by nozzle manufacturers.

4. Have a water tank, auxiliary engines and pumps, and a hydraulically driven hose reel.
5. Have root cutting blades that are hydraulically spun.

C. Mechanical Cleaning Equipment:

1. Bucket machines shall be in pairs and 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 shall not be acceptable.
2. Power rodding machines shall be either sectional or continuous type capable of holding a minimum of 750 feet of rod. Rod shall be specifically treated steel. To ensure safe operation, machine shall have a fully enclosed body and an automatic safety release clutch or relief valve.

PART 3 – EXECUTION

3.1 GENERAL

- A. Cleaning Precautions: During sewer cleaning operations, satisfactory precautions shall be taken in use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard flow in sewer line are used, precautions shall be taken to ensure that water pressure created does not damage or cause flooding of public or private property being served by sewer. When possible, flow of sewage in sewer shall be utilized to provide necessary pressure for hydraulic cleaning devices. When additional water from fire hydrants is necessary to avoid delay in normal work procedures, water shall be conserved and not used unnecessarily.
- B. No sewer cleaning shall take place in a particular sewer segment until upstream pipe segments have been cleaned. If cleaning is done in a downstream pipe segment to facilitate overall cleaning operations, segment shall be re-cleaned at no additional cost to Owner, after pipes upstream of that segment have been cleaned.
- C. Sewer line walls shall be cleaned adequately to provide for proper

operation of joint testing and sealing equipment or internal inspection to discern structural defects, misalignment and infiltration/inflow sources. Cleaning shall be performed immediately prior to joint testing and sealing and internal inspection to preclude build-up of debris from infiltration/inflow sources and discharges from upstream pipeline sections.

- D. Designated sewer manhole sections shall be cleaned using hydraulically propelled, high velocity jet, or mechanically powered equipment. Selection of equipment used shall be based on conditions of lines at the time the work commences. Equipment and methods selected shall be satisfactory to the Owner. If cleaning of an entire section cannot be successfully performed from one manhole, equipment shall be set up on other manhole and cleaning again attempted. If, again, successful cleaning cannot be performed or equipment fails to traverse entire manhole section, it will be assumed that a major blockage exists and cleaning effort shall be repeated with other types of equipment. Immediately report any blockages to the Engineer or Owner.
- E. Water for sewer cleaning shall be purchased by Contractor and obtained at locations in accordance with utility owner. If water is obtained from a potable supply, provide appropriate backflow prevention devices as required by authority having jurisdiction to protect potable system from cross connections and contamination. Contractor shall be solely responsible for preventing cross contamination of any public or private water systems used for this purpose.

3.2 PREPARATION

- A. Selection of cleaning equipment shall be based on conditions of manhole and sewer lines at the time the work commences. Equipment and methods selected shall be acceptable to Engineer. Acceptance of proposed method of cleaning does not relieve Contractor of its responsibility to adequately remove dirt, grease, rocks, sand, and other materials and obstructions from sewer lines and manholes to allow performance of other work.
- B. Take satisfactory precautions to protect sewer lines from damage that might be caused by improper use of cleaning equipment. Whenever using hydraulically propelled cleaning tools that depend upon water pressure to provide their cleaning force, or any tools that retard flow of water in sewer line, take precautions to ensure that water does not cause damage or flooding to public or private property.
- C. No fire hydrant shall be obstructed in case of a fire in area served by hydrant.

- D. Remove water meters, piping, and related equipment from fire hydrants at end of each work day.

3.3 PERFORMANCE

- A. Selection of cleaning equipment shall be based on conditions of manholes and sewer lines at the time the work commences based on pre-construction CCTV inspection to be conducted by [City or Contractor- select one specific to the project].
- B. Contractor shall provide appropriate screening to stop passing of materials into downstream sewers. Sludge, dirt, sand, rocks, grease, and other solid or semisolid residue, debris, and material resulting from cleaning operations shall be removed at downstream manhole of section of sewer being cleaned. Passing material from manhole section to manhole section which could cause line stoppages, accumulations of sand in wet wells, or damage to pumping equipment shall not be permitted.
- C. Debris, residue, and other materials resulting from cleaning operations shall become property of Contractor and shall be removed from site at end of each workday and shall be disposed of in an approved and lawful manner. Under no circumstances will accumulation of debris, residue, and other matter be permitted on site beyond stated time, unless prior written authorization is given for storage in totally enclosed containers.

NOTE: Enter location where contractor can dispose of solids if City want to specify this. Include Specifics regarding the scheduling, monitoring, disposal fees (if any) and approved methods and that procedures for disposal must be arranged with [ENTER THE NAME AND NUMBER OF PERSON WITH CITY]

- D. Light Cleaning: Use balls, scooters, and three (3) passes of high pressure water jetting equipment, brushes and swabs. Costs related to cleaning of such sewers shall be included in Contractor's unit prices for CCTV and Light Cleaning.
- E. Heavy cleaning: Use bucket machines, scrapers, and augers with cleaning which requires more than three (3) passes with hydraulic cleaning equipment to achieve acceptance acceptable results. Heavy cleaning will be conducted only upon approval and direction of Engineer. Refer to Section 012663 Change Order Procedures as applicable to a particular project. Costs related to cleaning of such sewers shall be included in Contractor's unit prices for Heavy Cleaning. Costs related to televising of such sewers following heavy cleaning shall be included in Contractor's unit prices for CCTV and Light

Cleaning. Compensation for heavy cleaning of a particular line will only be paid if:

1. Heavy cleaning was authorized by Engineer prior to Contractor performance of the work.
2. Contractor proves that both significant time and effort was necessary to clean the line, i.e. time required to clean and inspect the line must have been at least twice the average time required to clean and inspect other sewers of comparable length and diameter in project area.
3. Adequate video proof of blockage, debris, grit or grease build-up, or other condition is provided by Contractor. Heavy Cleaning will be paid for on a lineal foot basis only for length required to be cleaned, i.e., from downstream manhole to approximate location of heavy cleaning. This may or may not include entire pipe section, unless otherwise approved by Engineer or Owner.

F. Obtain video proof of heavy cleaning by acquiring a 'before' video of accessible portions of obstructed reach; submit to Engineer along with completed inspection.

1. A submerged camera does not justify a need for heavy cleaning; proof that submergence was due to a blockage or heavy debris and not a sag in the line will be required.

G. Pipes that contain roots or debris depths greater than 25 percent of pipe height may be paid on a time and material basis, upon approval by the Engineer or Owner. Engineer or Owner may determine any individual pipe be cleaned on a time and material basis.

H. Flushing of sanitary sewers to facilitate cleaning activities without the capture of solids and debris is expressly prohibited.

I. Retrieval of equipment lodged in pipes or a wet well is Contractor's responsibility and shall be performed at Contractor's expense.

NOTE: Bid item should be included for hourly rate for the excessive heavy cleaning described in Item G above.

3.4 FIELD QUALITY CONTROL

A. Acceptance of sewer line cleaning shall be contingent on satisfactory completion of television inspection. If television inspection shows cleaning to be unsatisfactory, sewer line shall be re-cleaned and re-inspected until cleaning is shown to be satisfactory.

B. If internal joint testing and sealing is to follow cleaning, give particular attention to adequacy of cleaning to ensure that proper seating of sealing packer can be achieved.

C. Inspection of cleaning operations will be made on a daily basis by the Engineer or Owner.

3.5 CLEANING

A. Upon cleaning of underground sewer lines or structures, removal remove debris from finish grade and clean work areas so conditions at conclusion of the work are equal to or better than areas prior to work of this Section.

END OF SECTION