

SECTION 23 SEWER SYSTEM TV INSPECTION

23-01 GENERAL

The work to be done consists of furnishing all labor, materials, methods or processes, implements, tools, machinery and equipment required to clean and to televise various sanitary sewer lines through the City. The purpose of the sewer cleaning and television inspection is to determine needed repairs, maintenance practice, and general condition of the sewer lines.

23-01.01 Use of City's Municipal Service Center for Operations Base

The Contractor will not be permitted to use the City of Los Altos Municipal Service Center as a base of operations for the sewer TV Inspection operations.

23-01.02 Advance Work to be done by City

An inspection to locate all manholes at the work sites will be made by the City forces in advance of the sewer cleaning operations of the contractor. In the event sewer manholes are buried, covered or otherwise not visible, the city will take the necessary steps to expose the manhole for access by the contractor. In the event an individual manhole cannot be located, the contractor will be directed to work on the pipe section from other available adjacent manholes. In the event of two consecutive manholes cannot be located, the pipe section between the 2 subject manhole will be deleted from the contract. The contractor will receive no compensation for any pipe section deleted from the contract. The contractor will not be responsible for uncovering or exposing manholes

23-01.03 Access to Manholes

Some of the manholes to be used on this project may not be directly accessible by trucks or other vehicles. The contractor shall be responsible for determining which manholes are not accessible to his/her vehicular equipment and shall plan his/her cleaning and televising operations accordingly. No additional compensation will be allowed for pipe sections without direct vehicular access. In addition, some manholes are not accessible at all. These manholes are noted on the detailed maps. In the event a specific pipe section is inaccessible to the extent beyond specified hose lengths for cleaning and specified cable lengths for televising, the City will consider deleting this pipe section from the contract.

23-01.04 Notification

In the event that a problem arises with the TV Inspection operations, or there is a problem with any of the existing sewer lines, the Contractor shall notify the Engineer immediately and report the problem.

23-02 MATERIALS

None

23-03 CONSTRUCTION

23-03.01 Sewer line Cleaning

23-03.01.01 General

The designated pipe shall be cleaned using high-velocity jet (hydro-cleaning) equipment. The contractor shall submit a work plan for review and approval by the City. This work plan shall outline the equipment and methods selected for this project. The equipment shall be capable of removing dirt, grease, roots, rock, sand and other material and obstructions from the sewer lines and manholes. Other types of cleaning and/or repairs will be performed by the City and will not be the responsibility of the contractor.

The intent of sewer line cleaning is to remove foreign materials from lines and restore the sewer to a minimum of 95% of the original carrying capacity. It is recognized that there may be some conditions such as broken pipe and 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 discontinue cleaning operations and notify the City immediately of such problems. Contractor will not be required to work on those specific sections until repair or cleaning with other types of equipment is performed by the City or the section may be deleted from the project. If, in the course of normal cleaning operations, damage does result from pre-existing and unforeseen conditions such as broken pipe, the Contractor will not be held responsible.

The cleaning shall be accomplished with four passes with the hydroflusher. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the next adjacent manhole and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire pipe section, it will be assumed that a major blockage exists and the cleaning effort shall be abandoned.

23-03.01.02 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. 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, pump

and hydraulically driven hose reel. The equipment shall have an operation length of at least 600 feet.

23-03.01.03 Cleaning Precautions

During work operations, satisfactory precautions shall be taken by the contractor to prevent damage caused by flooding.

23-03.01.04 Water Use for Cleaning

The contractor shall be responsible for all cost for obtaining water. The contractor shall make necessary arrangements with California Water Service Company, 650-917-0152 for work within the City of Los Altos to rent a potable fire hydrant water meter. The contractor shall comply with all regulations of the California Water Service regarding the use of their facilities.

23-03.01.05 Material Removal

All sludge, dirt, sand, rock, 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 or damage pumping equipment, will not be permitted.

23-03.01.06 Documentation

The contractor shall document cleaning effort on written Cleaning Records for each line cleaned. Information recorded shall include estimates of quantity of water used in the cleaning operation, type and estimated quantity of material removed from the line (i.e.; grease, roots, debris, rocks), and special circumstances encountered (such as blockages). These logs shall be submitted to the City weekly.

23-03.01.07 Disposal of Material

All solids or semi-solids resulting from the cleaning operation shall be removed from the site and disposed of at the City of Los Altos Municipal Service Center, located at 707 Fremont Ave. The contractor shall coordinate with the Engineer's inspector regarding disposal method and operations. All material shall be removed from the work site no less frequently than at the end of each workday. Under no circumstances will the Contractor be allowed to accumulate debris on the site or the work beyond the stated time.

23-03.01.08 Final Approval of Cleaning

Final approval of sewer line cleaning shall be made by the Engineer upon the successful completion of the television inspection of each pipe section and shall be to the satisfaction of the Engineer. If the television inspection shows the cleaning to be unsatisfactory (except in sections needing repairs or additional

cleaning methods), the Contractor shall be required to re-clean and to re-inspect the sewer line at no additional cost to the City.

23-03.02 Television Inspection

23-03.02.01 General

Contractor shall have certification from the Pipeline Assessment Certification Program (PACP).

23-03.02.02 Equipment

Video equipment shall include a multi-angle television camera capable of spanning 360-degrees circumference and 270-degrees on horizontal axis to televise sewer lines that are lined, 6-inch diameter or larger; the purpose of the rotating head camera is to view all service connections, upstream and downstream manhole structures, and to locate all defects, as well as questionable problem areas; focal distance shall be adjustable through a range of one (1) inch to infinity. The television camera shall be color format and specifically designed and constructed for operation in connection with sewer inspection and for operation in sewers under 100% humidity conditions. Lighting and camera quality shall produce a clear, in-focus picture of the entire periphery of the pipe for a minimum distance of six feet. Other required equipment are television monitor, cables, power sources, lights, and other equipment necessary to do the work.

23-03.02.03 Software

The Contractor shall use CCTV inspection software that is PACP certified which assure that the software can be used to export a database of all inspection and defect details that conform to the NASSCO PACP database standards. The electronic copy of the data collected shall be in a Microsoft Access format and such that the video and audio can be viewed by using Microsoft media player. Inspection recording shall be archived in a hard drive format.

The Contractor shall have all operators who are responsible for making observation and recording defects into the data collection software and databases successfully trained and certified through NASSCO's PACP. Prof of NASSCO certification will be required prior to project initiation.

23-03.02.04 Televising Procedure

Television inspection shall be performed with a closed-circuit color television system and in accordance with the National Association of Service Companies' (NASSCO'S) Pipeline Assessment Certification Program (PACP). The inspection shall be done one pipe section at a time. The intent of the television inspection is to document the condition of each sewer main. The television inspection logs and video recordings submitted to the City shall accurately describe in detail the condition and location of each pipe section inspected. The television inspection shall be made within 72 hours of the cleaning provided as part of this contract. If entrance is required into a manhole, the Contractor must obtain an entrance

permit from the City prior to entering any manhole. Contractor must follow all City and OSHA requirement for confined space when entering any manhole. If televising of an entire section cannot be successfully performed down stream from one manhole, the equipment shall be set up at the downstream manhole and televising again attempted going upstream. If, again, successful televising cannot be performed or the equipment fails to traverse the entire pipe section which can not be attributed to improper cleaning, it will be assumed that a major blockage exists and the televising effort shall be abandoned and the City shall immediately be notified.

Depth of flow shall not exceed twenty percent (20%) of the inside pipe diameter as measured in the manhole when performing video inspection. In the event the depth of flow of the reach being televised exceeds twenty percent (20%) of the inside pipe diameter, the Contractor shall provide the necessary flow control or reschedule the inspection for a time when such flow is reduced to permit proceeding with the work. If nighttime work is necessary, the Contractor shall obtain an approval from the Engineer.

The camera shall be moved through the pipeline in either direction at a uniform rate, stopping when necessary to ensure proper documentation of the sewer's condition. In no case shall the television camera be pulled or propelled at a speed greater than thirty (30) feet per minute. The camera height shall be adjusted such that the camera lens is always centered in the pipe being inspected. The equipment shall have an accurate footage counter, which shall display on the monitor the exact distance of the camera from the centerline of the starting manhole. Unless otherwise approved by the Engineer, footage measurements shall begin at the centerline of the upstream manhole.

It shall be the contractor's responsibility to ensure that the camera and other equipment will be accessible for use in the manholes. Any modification of manhole based will be allowed only at the discretion and approval of the Engineer and manhole shall be restored to their original condition or as approved by the Engineer. It shall also be the responsibility of the Contractor to retrieve the camera unit at no additional expense to the City should it become lodged in the pipe.

When manually operated winches are used to pull the television camera through the line, telephones, two-way radios or other suitable means of communication shall be set up between the two manholes of the section being inspected to insure proper communications between members of the crew.

The importance of accurate distance measurements is emphasized. Marking on the cable, or the like which requires interpolation for depth of manhole, will not be allowed. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, or other suitable device, and the accuracy shall be to the satisfaction of the City. Continuous measurement shall also be shown on the videotape.

23-03.02.05 Documentation

A sample of the video and supporting documentation matching the requirements of this contract shall be provided by the contractor for approval prior to beginning of work. Contractor is at risk if inspection work is conducted prior to approval of this submittal.

23-03.02.05.01 Video

Video recording shall supply a visual and audio record of the information contained in the inspection logs as described below. The date, identification of sewer reach(es) by upstream and downstream manhole numbers, and manhole to manhole footage shall be displayed on the video data view at all times. Each recording shall be permanently labeled with the Contractor's name, date televised, project name, street name(s), identification of the sewer reach(es) inspected, and run number. The audio portion of the recordings shall be in English and intelligible in its entirety. If the recordings have any errors or are of such poor quality that the Engineer is unable to evaluate the condition of the sewer, locate sewer service connections, or verify cleaning, the Contractor shall re-televiser the sanitary sewer and provide a new recording of good quality at no cost to the City. No payment will be made for recordings that do not meet the requirements of these specifications. The contractor shall maintain copies of the written logs until the City accepts the project.

23-03.02.05.02 Digital Picture

A picture of each noted defect shall be provided. Pictures shall be in a .jpg format and a copy of the .jpg shall be print on the respective video logs. An electronic copy shall be submitted with the video.

23-03.02.05.03 Video Logs

The Contractor shall keep printed location records for each pipe section inspected. The logs will clearly show the location of points of significance, as discussed below, in the sewer line of relation to the manhole and the depth of the pipe below the ground. Distance will be measured from the center of each manhole.

Points of significance to locate in the sewer lines include: broken/cracked pipes, root intrusions, infiltration points, presence of scale and corrosion, obstructions, offset or separated pipes/joints, protruding or separated laterals, sags in the line, or any other unusual conditions. All points of significance shall be rated as to the severity of the problem (light, medium, and severe). The Contract shall use the standard PACP defect rating system for each segment. In addition, all building laterals on the logs and videotape.

Each record shall accurately describe the above ground location of the section including the sewer line location numbers (as identified in these specifications), street name (s), direction traveled (upstream, downstream), direction of flow, adjoining house numbers, any other landmarks that will clearly and quickly

identify the section, pipe line material, pipe size, pipe length, lateral connection location, and a detailed logging of defects encountered. A sketch identifying the line segment shall be included on each log. In addition, the date of inspection, operator of equipment and name of firm shall be recorded on each log.

Video inspection logs furnished by the Contractor shall be typed or printed as a computerized report and shall have NASSCO's PACP ratings for each segment of sanitary sewer pipe which must include the quick structural rating (QSR), structural pipe rating (SPR) and structural pipe rating index (SPRI). These logs shall be submitted to the City on a weekly basis. The Contractor shall submit a sample copy for approval. The Contractor shall submit a complete printed set of the logs at the conclusion of the project.

23-03.02.05.04 Final Submittal

After completion of the CCTV of all segments of pipe, the contractor shall submit a hard drive containing all the video, digital pictures and logs. Contractor shall also submit a final hard copy set of all the logs and digital pictures from the entire project. These logs with their accompanying pictures shall be submitted alphabetically based on the upstream manholes in three-ring binders.