

ATTACHMENT A

TECHNICAL PROVISIONS (TP)

2022 Sanitary Sewer Mains Cleaning and Video Inspection

Hillsborough, California

Work associated with this project includes the following:

- A. Sewer line cleaning
- B. Sewer line CCTV/Video inspection and condition assessment
- C. Manhole cleaning and depth measurement
- D. Documentation
- E. Reporting

Technical Requirements

1.0 Safety and Health Regulations

General. The Contractor shall comply with all applicable occupational safety and health standards (OSHA), rules, regulations and orders established by Federal and State Agencies, including the Federal and State Clean Water Acts. Full compensation for conforming to the requirements of this section shall be considered as included in the fees paid for the other various items of work involved and no separate payment will be made, therefore.

2.0 Personnel:

- 2.1 Personnel conducting CCTV/Video inspections shall be properly trained in the use of the equipment and procedures. They shall have a documented minimum of one (1) year of direct first-hand experience in sewer line cleaning, inspection and compliance with health and safety requirements.
- 2.2 In addition to the above, the operators conducting CCTV/Video inspection and performing manhole inspection must currently hold NASSCO's PACP and MACP certification. The certified operators must apply the NASSCO standards to correctly code the condition of line segments and manholes structure. A copy of NASSCO certifications for each employee conducting shall be provided to the Town upon the award of the contract.

3.0 Sewer Cleaning Equipment & Procedure:

- 3.1 Contractor to provide two-man crews with a combination cleaning truck including all cones, safety lighting, and signs necessary to complete the task.
- 3.2 Contractor shall use Combination Sewer Cleaning (Vacuum-Hydrojet) Trucks capable of providing a minimum of 50 GPM and at a minimum pressure of 2,000 PSI. The Cleaning trucks shall have capability of reaching easements and have hose capability of 800 LF. Combination Cleaning trucks are the preferred method of cleaning. Vacuum systems with either centrifugal or positive displacement blower vacuum equipment suitable to remove debris at the downstream manhole while jetting is required.
- 3.3 Contractor is required to use the appropriate nozzle or cutter head, (e.g. high velocity, water jet, root cutter, etc.), to perform the sewer cleaning as required for the specified sewer line. The nozzles shall be capable of producing a scouring action, such as Tier 2 or Tier 3 Rotational nozzle (i.e., Warthog or ENZ's Bulldog). Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor. Sewer will be cleaned by removing grit, loose solids, and grease. Leaving residual debris of no more than 5% of the pipe diameter, which should be sufficient to facilitate video inspection. The required cleaning will typically require two pass cleaning which should be sufficient in removing materials and debris. All manholes shall be washed down while cleaning the sewer lines.
- 3.4 During cleaning and inspection of the sewer system, Contractor must monitor the condition of the sewer line to ensure the cleaning operation is not causing any sewer overflow. Contractor will be solely responsible for cleaning any sewer spill and paying for any damage to a private or public properties. In case of incidental sewer overflow, Contractor must immediately notify Town of Hillsborough Public Works department at 650 375 7444.

4.0 CCTV/Video Inspection Equipment & Procedure

- 4.1 The CCTV/Video inspection shall be done with a color camera, with all inspection log data, footage, observations, still images, as well as full streaming video and audio, recorded digitally. The operating range must be at least 800 feet.
- 4.2 The equipment used for the inspections shall be commercially manufactured for operating in sewer pipelines.
- 4.3 The camera and tractor package must be capable of traveling through 6 or 8 inch mainlines (including VCP pipe with a maximum offset of 1.0 inches).
- 4.4 The camera and tractor package must be capable of climbing various grades or steepness up to 30%.
- 4.5 The camera shall be moved through the line in either direction at a moderate rate of no more than 30 feet per minute, stopping when necessary to permit thorough examination of significant features.

- 4.6 If a substantial defect is found in a line, multiple passes back and forth, as well as panning and tilting, may be necessary to provide adequate information about the extent of the damage. Multi passes are not required for minor damage, such as cracks showing no displacement or small roots. However, the camera movement must be reduced to examine the condition of the pipe
- 4.7 All sources of ground water infiltration through cracks, joints or at a lateral connection must be thoroughly examined.
- 4.8 If, after attempting from the opposite end, the camera still fails to pass through the entire segment, the inspection will be considered complete if the camera reached a significant obstruction (large offset, intruded lateral or partially collapsed pipe) preventing a complete pass and videoing of the line.
- 4.9 If the television camera cannot make a complete pass through the entire pipeline segment from either manhole due to grade, the Contractor shall be required to switch to equipment capable of making the climb. This may include different tires, a tractor mechanism, or another camera and tractor package. If still unable to obtain a complete pass, contractor shall utilize manual efforts including use of tag lines to pull camera through.
- 4.10 If camera is unable to make a complete pass-through pipeline segment due to obstructions such as debris, roots, or due to sags in the line, the jetting cleaning vehicle crew shall work in tandem with the CCTV camera crew in order to clear obstructions or to draw down the water levels in order to obtain a complete pass.
- 4.11 In a situation where it is not possible to obtain a complete inspection, the Contractor shall notify the Town the same day of the incomplete inspection, and the Engineer, or his designee, shall determine when and if the inspection shall be suspended.
- 4.12 In addition to recording the condition of sewer mains, the Contractor shall also stop the camera at each lateral or service line entry point and thoroughly examine the entire perimeter of the junction between that line and the main.
- 4.13 The camera must be capable of panning through at least 135 degrees both ways from center and tilting at least 90 degrees each way from level, and it must be able to focus from infinity down to the wall of the pipe immediately alongside.
- 4.14 Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe for four feet ahead. Focus must be controllable from the monitor.
- 4.15 The camera, television monitor, video recorder and all other components of the system shall be capable of producing picture quality to the satisfaction of the Engineer, or his designee, and if the results obtained are not satisfactory the equipment shall be replaced.
- 4.16 CCTV collection software must be PACP, MACP, and LACP version 7.0 certified or better.
- 4.17 The equipment for monitoring and recording the CCTV/Video inspection shall include software that can be used to generate and organize notes, the audio of the operator's comments, and video and still photographs of observed features and defects into a digital record, further described in section 4.4. Resolution of the video picture must be at least 600x800.
- 4.18 Recordings of all sewer line inspections shall be transferred to a memory stick or portable hard drive (DVR is not acceptable) The audio portion of the composite digital video shall be sufficiently free from electrical interference and background noise.

- 4.19 A read-out of distance from the starting point of the inspection, accurate to one tenth of a foot (0.1 ft.), must be continuously displayed; the meter must show reducing distance as the camera reverses direction. A complete video for a segment shall be from the center of one manhole to the center of the next. A reasonable estimate of offset from the center of the access manhole to the camera head may be added to the meter at the start of each run, and each run shall end at the center of the next manhole. Accurate distance measurement, recorded directly on the video of the inspection, is of great importance, both for determining compensation to the Contractor and for pinpointing necessary repairs or other advised conditions. Therefore, video files with unreliable footage readings will be unacceptable.
- 4.20 No payment will be made for an unsatisfactory inspection video record.

5.0 Sewer Lines Cleaning Procedure

- 5.1 Prior to opening a manhole to conduct cleaning or video inspection of a pipe segment, the Contractor shall write the manhole ID number on an 8"x12" whiteboard to be placed near the top of manhole cover. Video and still photo of the ID number shall be taken and provided to the Town as a part of documentation and reporting requirements of the contract. The photos must capture an area of 4 feet radius from the center of the manhole cover.
- 5.2 Sewer pipe cleaning must be performed prior to any CCTV inspection. All line segments and manholes shall be cleaned to the point that the entire pipe or manhole is visible. Very light deposits may, in the opinion of engineer, be acceptable. However, any deposits that obscure a joint, obscure a potential defect or result in a backup in the line will not be acceptable.
- 5.3 Inspections of any pipe sections that are, in the opinion of the engineer, not properly cleaned shall be re-cleaned and re-televised at no additional cost to the Town. The video inspection shall be conducted within 36 hours after the segment is being cleaned.
- 5.4 All cleaning activities must be date and time stamped on the inspection form.
- 5.5 The contractor shall completely remove and dispose of all solid materials (dirt, debris, roots and rags) out of the sewer system for proper disposal at no additional cost to the Town.

6.0 Documentation & Reporting

- 6.1 Mainline videos are to be labeled with the name of the segment inspected. The naming convention for identifying sanitary sewer mainline segments in the Town of Hillsborough uses the designation of the upstream manhole or cleanout followed by the downstream manhole or cleanout, separated by an underscore character, as follows:

SSMH2K14_SSMH3K2, or SSCO7B5_SSMH7B5

- 6.2 A comprehensive database of information from all inspections shall be maintained using PACP 7.0, and MACP 7.0 file format and codes; the Contractor shall confer with the Engineer regarding database layout and desired data fields prior to commencing work. All defects recorded by the Contractor shall be reported in accordance to the NASSCO's defects coding.
- 6.3 All cleaning and inspection works must meet NASSCO's PACP specifications and at minimum contains the following information:
- i)** Name of the person performing the work,
 - ii)** GPS Location with documentation
 - iii)** Location, street or easement, manhole or cleanout ID numbers
 - iv)** All line segments must match the list of segments as provided in the attachment
 - v)** Date and time of inspection,
 - vi)** Weather condition. No video inspection is allowed during excessive rain.
 - vii)** Video inspection after excessive rainfall must be approved by the Town's Engineer,
 - viii)** Photo of the manhole number
 - ix)** Pipe types and diameter
 - x)** Water level in the manhole and pipes
 - xi)** Manhole conditions (types, clean/dirty, broken,
 - xii)** CCTV Direction (upstream, downstream)
 - xiii)** Distance traveled
- xiv)** All observations: roots, cracks, breaks, offset joints, corrosion, lateral location, lateral connection condition, infiltration, or any other condition that adversely impact the operation of the sewer system.
- 6.4 In addition to submitting Manhole and line cleaning data in a MACP 7.0 file format, the contractor shall use the Town of Hillsborough's Manhole Inspection Log, which is included herein as Attachment D. The Contractor shall identify the Manhole ID Number, GPS location, frame, cover types, measurements, channel and base condition, and any other features as specified in NASSCO PACP and MACP program.
- 6.5 Photographs: The Contractor shall capture digital colored still images of all significant observations made during every inspection. The date, time, segment or lateral identification and correct location measured from the start of the inspection must be shown on the photograph.
- 6.6 Digital Video Recordings: The purpose of the recordings is to supply a visual and audio record of the sewer lines to document current condition, problem areas and connections in the lines. Recording playback shall be at the same speed in which it was recorded. Slow motion or stop-motion playback features may be supplied at the option of the Contractor. The date, time, adjacent property address, segment or lateral identification, pipe diameter and material, direction of travel and the one-way distance traveled shall all be clearly annotated directly onto the video along with all observation codes. All comments related to the inspection and to individual observations must be typed into an associated comment text field and be retrievable from within the

inspection database. Audio overlay alone will not be accepted. If audio capability supplements the database and is provided, a clear verbal description of the issues encountered in the pipe shall also be included. Title to the recordings shall transfer to the Town upon submittal by the Contractor.

- 6.7 Digital media: In addition to paper reports, all inspection logs and photographs shall be submitted digitally on a portable drive with a minimum capacity of 500 giga bite or higher including USB 3.0 port. The portable drive must contain all project files and a label to include project name, Project number, name of company and submittal date.

7.0 The Town Will Provides

- List of all segments to be inspected under this project
- A hard copy of the Map of the main sewer lines and manhole
- Assistance with locating manholes, cleanouts or accessing the easements, if needed
- Hydrant meter. It is the responsibility of the contractor to obtain use permit for hydrant meter and pay for water usage
- Temporary ID card issued by Town of Hillsborough