

2020 - SECTION 25**CLOSED CIRCUIT TELEVISION INSPECTION OF SEWER LINES****25.1 GENERAL**

Aquatera will perform the CCTV's for all subdivisions for the 2018 construction season and beyond, as part of the inspection process.

The contractor shall provide Aquatera with clean infrastructure as part of the NASCO standards, by flushing and cleaning prior to scheduling the CCTV inspection. The contractor will also insure accessibility to and throughout the work site for Aquatera to perform the CCTV inspection. Failure to complete the requirements above will result in charges to the contractor to be paid prior to CCTV re-inspection being scheduled. Contractors will schedule CCTV inspections with the DC maintenance department at inspections@aquatera.ca a minimum of 10 business days prior to inspection date requested.

CCTV deficiencies found during inspections will be forwarded to the consultant to facilitate repair/correction with the contractor. The contractor shall notify their consultant and Aquatera in writing through inspections@aquatera.ca that the deficiencies are repaired so Aquatera can schedule a re-video. Only the initial CCTV and one re-video of any run will be free of charge, any subsequent CCTV required at CCC/FAC will be charged to the contractor.

For all subdivisions constructed prior to Jan. 1, 2018 the standards below will apply.

This section of the specifications shall form a part of the contract documents and should be read in conjunction with them.

Prior to CCC, all sewer mains shall be videoed. Should any anomalies be noted at the CCC inspection or during the warranty period, Aquatera may require a second CCTV prior to issuing the FAC. A written report and a colour video in flash drive or DVD format shall be submitted to Aquatera for their approval and records prior to the issuance of the Construction Completion Certificate. The work shall include television inspection of sewer mains from centre to centre of manholes, in order to see the inlet connection, a digital or audio commentary on location with distance encoding, and a written or digital report, still photographs of problem areas and all manhole connections. Sanitary services shall be submitted in individual files for each service. A backup copy of the report and video shall be maintained by the consultant for 30 days after the submission to Aquatera.

The equipment, materials, and methods used must produce suitable video records

with clear high quality picture with a minimum recorded resolution of 640 x 480, and a maximum recorded resolution of 1024 x 768. The minimum Frames per Second (FPS) shall be 24, and the maximum FPS shall be 30. The video file format shall be at a minimum of MPEG-2 compression standards. The video shall also include logs for the identification and categorization of deficiencies, as well as the determination of the location, extent and seriousness of each deficiency.

All sewer lines shall be flushed and cleaned prior to video inspection. The consultant/contractor shall contact Aquatera 48 hours in advance at inpsection@aquatera.ca or (780)538-0348 in order for Aquatera to remove and reinstall the bulkhead. Lines, including stubs must be inspected with either actual flow or simulated flow produced by adding water at an upstream manhole or riser pipe. The simulated flow must be clear enough to see the wall of the pipe through the flow and produce a visible, laminar flowing stream in the line for the full length of the line being inspected. Inspections will be rejected where the simulated flow exceeds one-third the diameter of the pipe or contains debris in the line or the interior walls are dirty. Additionally video inspections will be rejected if the video is not in compliance with the complete Aquatera CCTV standards.

Aquatera reserves the right to request video inspection of any infrastructure adjacent to any construction near the sanitary system.

25.2 MATERIALS

25.2.1 VIDEO RECORDS AND INDEX PLAN

Video records are to be supplied by the Contractor and shall be in DVD format and in colour. The contractor shall set up the DVD's on a format where each section of pipe or services has a separate chapter number. All video inspections are to be done in colour and with sufficient lighting to result in clear high quality picture in accordance with Section 25.1. The Contractor must also provide an 11" x 17" plan with an Index of video runs to pipe element or manhole numbers. All CCTV screen labels, file labels, still photographs, and index logs shall match with the respective runs. Manhole numbers shall be as prescribed by Aquatera and/or the Municipal Engineer and, in the absence of such, the manhole numbers on the Detailed Engineering Drawings shall be used. The manhole numbers from the Detailed Engineering Drawings shall be on a plan showing the location and the number of the manholes, and is to be bound in with the video and index sheet. There shall be separate video DVD's for sanitary mains and services. Separate logs shall be provided for each DVD. There shall be a summary sheet provided for both mains and services with the lengths of each run and the total meters videoed.

25.3 INSTALLATION**25.3.1 GENERAL OPERATIONS**

The entire length of each sewer shall be video inspected from the centre of manholes to the centre of manholes and/or end of video inspection riser. In new developments, terminating videos at the connection point to an existing stub will not be permitted. The camera unit shall, at no time, travel at a rate of speed greater than 9 m per minute. If for any reason, the video camera unit will not pass from one manhole to another then a reverse run shall be done at no extra cost. The video inspection shall take place during low flow conditions. Camera travel shall be in the same direction as the flow, at all times, unless impractical or when a reverse run is necessary. Newly constructed pipes are to be video inspected with simulated flow by running water into an upstream manhole or clean-out. For suspected sags, terminate flow and observe if the water dissipates, alternatively, finish the initial run, terminate the flow, and re-record the run in reverse.

The camera shall be positioned centrally in the pipe with a tolerance of +/-10%. If conditions within the pipe do not allow for this configuration, a greater tolerance may be allowed upon approval by Aquatera. Chainages for the video inspection shall begin at the centre of the starting manhole and terminate at the centre of the end manhole.

1. All services shall be video inspected prior to the sanitary main video inspection.
2. Sanitary main video shall have a pan and tilt camera to provide inspection of the outlet of the service.
3. Existing sanitary mains shall be video inspected if services were added to an existing sanitary main.
4. The Consulting Engineer shall review the video inspection, and report, prior to the submission to Aquatera.

25.3.2 VIDEO RECORDING

The video inspection of each section of sewer line shall begin with a digital or audio commentary describing the following:

- Time and date
- Weather
- Development Description and/or Phase

- Location description in an on-from-to format as described on the list of lines to be inspected
- Manhole numbers as provided by the Developer or Aquatera
- Size and use of sewer including pipe material
- Direction of flow
- Inspection Technician
- DVD identification number

This information shall also be written on the video report sheet.

25.3.3 WORK REPORT

A television work report, in log form, shall be completed during the inspection.

a) This log shall show the exact measured location of faults including, but not limited to:

- Open joints
- Broken, cracked, collapsed or ovaled pipe
- Accumulation of debris or obstructions
- Root penetration and root rating (1 to 9 root rating system)
- Infiltration and mineral deposits
- Water depth variation and sags
- Protruding gaskets
- Service connections and type (in-line or inserta-tee)

b) The reference location shall include the distance away from the reference manhole and also the position of the fault as referred to the crown of the pipe using the clock face notation. Significant faults are to warrant audio commentary on the video tape duplicating report information. The camera shall be stopped briefly at these locations. Colour photographs shall be taken of all sewer defects. The photographs shall be coordinated with the written report by reference numbers. Photographs of all deficiencies are required. Additional photographs shall be taken as deemed necessary.

c) One copy of the final written report with corresponding photographs and one copy of the video inspection DVD's or USB's shall be provided to Aquatera within 20 business days after completion of the CCTV inspection and the consultants review and recommendation.

d) All video inspection DVD's or USB's shall be numbered and cross indexed to the written report. Reports shall be bound and if more than one report is submitted in one binding, then there shall be an index sheet provided with the binding indicating the contents. Separate reports shall be submitted for mains and for services.

25.4 TESTING REQUIREMENTS OF THE CONTRACTOR

25.4.1 PRE-INSTALLATION

a) Materials

None required.

b) Systems

The Contractor must examine the mains and manholes to ensure that these facilities are adequately clean to allow video inspection.

25.4.2 INSTALLATION

a) Materials

None required.

b) Systems

None required.

25.4.3 POST-INSTALLATION

a) Materials

None required.

b) Systems

None required.

25.5 PAYMENT

Payment shall be full compensation for the procurement of all permits and

processes, the supply and the installation of all materials, equipment, labour, supervision and incidentals necessary to complete the work to these specifications.

25.5.1 TELEVISION INSPECTION

Television inspection of sewers shall be measured in lineal metres (L.M.) from the centre to centre of manholes. Payment for television inspection of sewers shall be at the tendered unit price. Only one payment shall be made for the successful inspection of each section of sewer main, regardless of the number of attempts made.

25.5.2 TESTING REQUIREMENTS OF THE CONTRACTOR

There shall be no separate payment for Testing required to be done by the Contractor.