CORPORATION OF THE CITY OF BURLINGTON

SPECIFICATION

INDEX FOR

CCTV VIDEO INSPECTION OF PROPOSED STORM SEWERS (SPEC. NO. SS7)

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CORPORATION OF THE CITY OF BURLINGTONC SPECIFICATION

FOR

CCTV VIDEO INSPECTION OF PROPOSED STORM SEWERS (SPEC. NO. SS7)

1. Scope of Work

The contractor shall be responsible for providing the necessary Video Inspection of all newly installed storm pipe. If the contractor does not have internal capabilities of Video Inspection, a CCTV contractor shall be hired at the contractor's expense and of the contractors choosing.

Storm sewer pipes including catch basin leads and catch basin structures shall be cleaned and flushed prior to video inspection.

The contractor shall video inspect all proposed storm pipes with a City Inspector present, or with notification to the City's Inspector including the date and time of the proposed inspection. The deficiencies that are found shall be rectified immediately and the relevant sewers and appurtenances re-videoed at the contractor's expense prior to the City establishing the date of substantial performance for the contract.

The contractor should also note that the placement of the proposed top lift asphalt shall not be permitted until the required CCTV report has been to the City for their final analysis and approval. Under no circumstance will the contractor be permitted to place the top lift asphalt until approval to do so is received from the City's Contract Administrator.

2. Contractor Certification

All sewer inspections are to be in CSA PACP version 6 format. The sewer inspection crew must include (1) PACP certified operator. Certification requirements for CCTV operators are as outlined in OPSS 409.04.01 part a (revised November 2013).

3. Flushing / Cleaning Equipment

All flushing and cleaning equipment will meet the requirements outlined in Appendix B. Sewers must be flushed to 95% capacity (no more than 5% debris). The City may request the contractor to flush downstream sewer lines outside of the work site, if it is found that debris from the worksite has entered the mains as a result of poor silt control on the job site. The additional flushing will be conducted at the contractor's expense.

4. Survey Operational Equipment and Vehicle

The CCTV contractor shall provide all required inspection equipment subject to the initial and continuing approval of the City. Vehicles and equipment must be numbered so that they may be easily referenced. The CCTV contractor will demonstrate equipment at the request of the City's Inspector or Contract Administrator (including cameras computers and printers) upon request. The survey vehicle shall comply with OPSS 409.06.02

All mainline inspection units will have pan and tilt capabilities. All survey equipment shall comply with OPSS 409.06.03

Spare equipment or parts for the closed-circuit, in-line television camera and monitoring unit, complete with self-contained lighting system shall be kept on site in each inspection vehicle at all times in order to minimize down-time in the event of equipment failure.

5. Camera Equipment

Mainline camera equipment shall consist of a self-contained, closed circuit solid-state, colour video camera, and a monitoring unit connected by a coaxial cable or better. This equipment will comply with OPSS 409.06.04. The electronic systems, closed circuit television camera and monitor shall be of such quality as to enable the following to be achieved:

- **Camera Resolution -** OPSS 409.06.04.01
- **Colour Constancy -** OPSS 409.06.04.01
- **Camera Position -** OPSS 409.07.04.02

Wherever prevailing conditions allow, the camera shall be positioned to reduce the risk of picture distortion. In the case of circular or elliptical mains, the camera lens shall be centrally positioned within the main (spring line). In the case of egg shaped mains, the camera lens shall be positioned vertically above the invert at a height two-thirds of the vertical dimension of the main. In all instances, the camera lens shall be positioned looking along the axis of the main. A positioning tolerance of $^{+}$/-5% of the vertical main dimension shall be allowed.

- **Camera Speed -** OPSS 409.07.04.03
- **Focus/Iris/Illumination -** OPSS 409.06.04.01

Appendix A
CCTV Inspection Media Reporting Requirements

OPSS 409.07.05 is replaced by Appendix A

A. Defect Coding

Survey data of all major defects, deficiencies and other locations of special interest, shall be properly referenced and recorded as per the CSA PACP version 6 format.

B. On Screen Data Display, Video Recording and Start of Survey

OPSS 409.07.04.01 will be used with the following modifications:

At the start of each main length, a data generator shall electronically generate and clearly display on the viewing monitor and video recording a record of data in alphanumeric form containing the following minimum information:

- Main/Lateral dimensions;
- Start and End manhole numbers and manhole locations;
- Pipe length reference numbers
- Date of survey (YY-MM-DD);
- Road name/location/Municipality;
- Direction of survey;
- Main use (ie Storm, or Sanitary)

C. Digital Data

To ensure the contractor is delivering digital data that is acceptable to the City of Burlington, a sample set shall be provided for acceptance. Once the City approves the sample, all other reports must be compiled and presented in the same manner. If a sample is not provided, the final report may be rejected and the City will ask for re-submission of the report in the specified format.

Any digital data that fails to meet the following requirements outlined in this section will be rejected and returned for reprocessing.

- **Digital Data Disk**

  All digital data shall be submitted on industry standard Microsoft Windows compatible DVD.

D. Survey Data Format

Computer generated tabular and image data shall be compiled as per the CSA PACP coding requirements and data specification.

The contractor shall consistently populate the following information on all reports to a documented field location (supplied to the City) in the data file.

- Lateral Dimensions
- Start and End manhole numbers (provided by the City's Infrastructure Technologist or found on contract drawings)
- Nearest adjacent address location of Start and End manholes
- All Street Names
- Pipe Numbers

E. Digital Video

➢ Digital MP4 File

- Video Image Frame size to be 720 x 480 pixels in size;
- Frame rate to be 30 frames per second or higher;
- Colour depth to be 24 Bits per Pixel;
- Compression to be MP4;
- Audio not required.

F. Final Report Format & Labelling

All inspection reports shall be contained in one or more standard 8 ½" x 11" file folder(s). The PACP (.mdb) and MP4 Digital CD-ROM shall be attached to the inside of the file folder preferably in a plastic envelope sleeve or equivalent. All data media shall be clearly labelled with permanent typed text.

A copy of any engineering drawings, sketches, etc. referenced by the Contractor shall be provided in the final report. The Contractor shall highlight all of the lines videoed.

Appendix "B" Flushing and Cleaning of Stormwater Mains to Facilitate CCTV Inspection

Scope of Work

The work covered by this appendix consists of providing all equipment and labour necessary to undertake flushing, cleaning, and reaming of storm water mains. The purpose of this flushing, cleaning or reaming work is to facilitate the CCTV Inspection of the sewer mains.
Completion of the CCTV Inspection shall occur within 48 hours of flushing, cleaning, and/or reaming. During this time, it is the Contractor's responsibility to ensure that the main remains clean. If any damages occur from negligent cleaning/flushing/reaming operations, the contractor shall be held fully responsible.

A. Operational Equipment

The Contractor shall provide all required flushing/cleaning equipment, which is subject to the initial and continuing approval of the City. All flushing/cleaning equipment shall consist of a combination flushing/vacuum unit with a two-man crew. The two-man crew must be solely dedicated to the flushing/cleaning operation.

Combination units will meet the following minimum requirements:

- 3700 litres of water for flushing;
- 150 m of 25mm rodder/flusher hose;
- Be capable of delivering 3.5 litres per second at the cutting head, with a pressure of 103 bar;
- Ability to control the pressure and the volume of water used for flushing;
- Carry sufficient sized cutting heads capable of cleaning mains from 150mm to 750mm in diameter, and produce a scouring action from 15 to 45 degrees;
- Have a 9 cubic metre debris tank capable of de-watering the solid debris;
- 200 mm vacuum pick up hose able to vacuum up larger debris, such as bricks or broken pieces of pipe.

B. Flushing

The purpose of flushing is not to clean the pipe but to remove any obstructions that might prevent the CCTV Inspection from being completed. All pipes requiring flushing will be flushed to 95% of the pipes carrying capacity. Any debris flushed back to the manhole must be removed and disposed of accordingly. Typically, existing mains greater than 450mm shall be flushed. The Contractor is to notify the City's Inspector 24 hours prior to the commencement of any flushing.

C. Cleaning

The purpose of cleaning is to remove all debris from the main. Where specified, mains will be cleaned to 99% carrying capacity.

All debris from the main and the manhole will be removed and disposed of accordingly. The pipe should be cleaned properly and completely the first time. If additional cleaning is necessary before the CCTV Inspection, it will be done at the expense of the contractor. The cleaning crew should only visit each main section once. If excessive debris is found during the CCTV inspection the inspection will be halted and the main cleaned until deemed acceptable. The Contractor is to notify the City's Inspector 24 hours prior to the commencement of any cleaning.

D. Debris

The Contractor shall be responsible for the transporting and disposal of all waste material associated with cleaning, reaming and/or flushing to an approved disposal site. The term debris includes sludge, dirt, rock, grease (that can be removed by flushing), and other solid or semisolid materials. **Abandoning of foreign materials in adjoining sewer lines is strictly prohibited.**

Prior to work commencement, the Contractor shall provide the City of Burlington with written approval from all receivers accepting the waste materials generated from the flushing/cleaning operation. The approval notice shall be addressed to the Contractor and the receiver's M.O.E. Registration Number must be indicated. The Contractor shall provide the City with copies of all disposal tickets from the receiver.

E. Reaming

Reaming activities performed are to allow for the full inspection of each main section and is not intended as a form of main rehabilitation. Reaming will be performed in order to eliminate those obstructions that cannot be removed by the cleaning process, such as protruding laterals, calcified joints, root penetration, or heavy grease deposits. A CCTV inspection unit will monitor the reaming process at all times. It is acknowledged that there are some conditions where additional damage would result if the reaming were to continue. Should such conditions be encountered, the reaming process will be continued or abandoned at the discretion of the City's Inspector or Contract Administrator. The Contractor is to notify the City's Inspector 24 hours prior to the commencement of any reaming. All reaming in areas of laterals or mains in poor structural condition will be done with a robotic cutter only. Any further damage caused by reaming will be assessed and any repair costs may be levied against the Contractor.