

S-32 CCTV SEWER INSPECTION

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32.01. SCOPE OF WORK

This specification shall be for the review and acceptance of any municipal sewer mainline or private drain connection installed or rehabilitated in the Corporation of the City of Windsor. The CCTV inspection work will be performed by municipal forces or by a private contractor approved by the Corporation of the City of Windsor.

32.02. REFERENCES

This specification refers to the following standards, specifications, or publications:

- OPSS.MUNI 409

32.03. SUBMISSION AND DESIGN REQUIREMENTS

Submission requirements shall be in accordance with OPSS.MUNI 409.

32.04. MATERIALS

Material requirements shall be in accordance with OPSS.MUNI 409 with the exception of the following.

All media storage to be submitted to the Corporation shall be in digital format (USB jump drive, USB external hard drive or cloud services) unless otherwise specified by the City Engineer.

When the Corporation discovers any deficiency during the CCTV inspection or review of the submitted CCTV inspection, the Corporation will supply a digital copy of the CCTV inspection showing said deficiency at no charge at the request of the contractor.

32.05. EQUIPMENT

Equipment requirements shall be in accordance with OPSS.MUNI 409. The Contractor shall also be required to adhere to the following.

32.05.01 Zoom Camera Equipment

The zoom camera equipment, computer, video recording equipment and ancillary supplies necessary to complete the zoom camera inspections must be transported in a mobile light duty truck. This vehicle shall be of appropriate size and weight to allow for inspections of manholes located on City streets within close proximity. Additionally, the Contractor shall make further provisions to perform off-road inspections in, but not limited to, recreational trails, alleys, sidewalks, and green spaces.

All inspections performed off-road using mobile and /or portable set-ups must be of the same video quality as those performed from the truck mounted system.

32.05.02 Zoom Camera

The inspection and evaluation of the sewer systems must be performed using a waterproof, pan and tilt colour camera, capable of entering into a minimum manhole cover size of 300 millimetres (mm). The zoom camera must be equipped with a remote controlled and integrated lighting system capable of providing clear image of the interior of the sewer pipe for a distance varying between 15 metres (m) to 30 m for small diameter pipe (such as 200 mm to 250 mm) and 30 m to 100 m in larger diameter pipe. Controlled from inside the mobile unit, the numerous individual adjustable light shadows are eliminated and "hot spots" are illuminated.

The camera shall be equipped with an optic telephoto lens with sufficient magnification that the farthest image is not degraded by the effects of pixelization. The camera will be capable of focusing in on objects to a minimum of 150 mm from the camera lens. The camera pan and tilt feature shall be capable of inspecting 360 degrees of a pipe, manhole or junction for (pipe circumference) pipes from 200 mm to 3000 mm in diameter, without raising or lowering the boom.

The camera must be detachable from the mobile unit for inspection of difficult locations using a tripod. The equipment must be capable of lowering the camera to a depth of at least 15 m inside the manhole.

32.05.03 Wide Angle Lens Manhole Inspection Camera

For detailed manhole inspections required under this Contract, the inspection and evaluation of the sewer manholes must be performed using a waterproof wide-angle lens, colour camera capable of entering into a minimum manhole cover size of 300 mm. The camera must be equipped with a compatible remote controlled, integrated lighting system capable of clearly illuminating the interior of the manhole.

32.06. CONSTRUCTION

Construction requirements shall be in accordance with OPSS.MUNI 409 with the exception of the following.

The Contractor is to notify the corporation, in writing, a minimum of 72 hours in advance of their scheduled sewer cleaning to request a CCTV sewer inspection on capital rehabilitation projects unless otherwise specified in the tender documents.

Should the corporation fail to schedule the requested CCTV inspection, on capital rehabilitation projects, after being notified in writing by the Contractor that the said sewers were ready for CCTV inspection, the corporation shall not hold the Contractor responsible for the cleanliness of the sewer unless otherwise specified in the tender documents.

Should it be found that during the CCTV inspection that the subject sewers are not cleaned properly, contain construction debris, or the Contractor does not have the proper access points available to the CCTV operators, the Corporation shall direct the CCTV inspection crew to leave the site unless otherwise specified in the tender documents.

Should this occur then the Contractor shall undertake the required cleaning and subsequent CCTV inspection work entirely at their expense and submit the required CCTV inspections for review and acceptance by the Corporation unless otherwise specified in the tender documents.

Immediately before the CCTV inspection of PDC's, the Contractor shall introduce a minimum of 10 litres of water, via the cleanout, to assist the CCTV operator in their inspection. Failure to assist in this requirement will result in the removal of the CCTV inspection crew from the site as noted above. The Contractor shall also provide assistance in the opening of all PDC's for inspection via the cleanout and for the laying of the pipes, backfilling with granular material, the supply and use of all appliances and materials, the disposal of all surplus excavated materials and the satisfactory cleaning of the site and for all work required under this specification, excepting those items for which other payment is herein provided.

If the CCTV inspection is for the review of an existing PDC, the PDC shall be flushed by the contractor immediately prior to placing the camera into the PDC. If debris removal, such as root infiltration, is required then this must be undertaken prior to the CCTV inspection.

32.07. CCTV INSPECTION

CCTV inspection requirements shall be in accordance with OPSS.MUNI 409 with the exception of the following.

When PDC CCTV inspection is being undertaken, the chainage will begin at the access point, the cleanout, located at or close to property line or located in the right of way, and be measured in metres toward the municipal mainline sewer or towards the building structure to determine the location of any deficiencies, if encountered. Prior to placing the camera into the cleanout or point of PDC access, video footage of the front of the property the PDC services shall be recorded prior to the CCTV of the pipe to confirm that the camera is being placed into the PDC at the required property.

32.08. QUALITY ASSURANCE

Quality assurance requirements shall be in accordance with OPSS.MUNI 409.

32.09. MEASUREMENT FOR PAYMENT

Measurement for payment requirements shall be in accordance with OPSS.MUNI 409. The Contractor shall also be required to adhere to the following.

32.09.01 Reports & Submittals

The Contractor shall submit the following deliverables for each work order completed in the contract:

- a) A final invoice showing details of hours/meters inspected.
- b) Maps to highlight inspections completed.
- c) Video inspection data including defect-coding data recorded on a media storage as outlined in Section 32.04. Video files names shall include:
 - Pipe segment ID
 - Date
 - Time
 - Starting manhole (for Zoom pole inspections only)
- d) The digital data to be formatted to enable uploading of the defect-coding data. All data must undergo Infrastructure Management System's (IMS) quality assurance program to be considered completed.
- e) WRc or PACP survey details must be time indexed to the digital video in a manner that will allow the images to be displayed when the survey data is viewed.

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- f) A summary excel spreadsheet for all pipes inspected submitted on a project basis. The spreadsheet will consist of the following completed columns.
- Type of inspection completed (completed pipe or partial pipe).
 - For Zoom inspections, use separate tabs for complete inspections, partial inspections and inspections not complete.
 - Pipe segment ID (Combination of the upstream and downstream manhole separated by underscore: (UpstreamMH_DownstreamMH))
 - Date of Inspection (Both dates for Zoom inspections)
 - Node Upstream
 - Node Downstream
 - Starting Manhole (For Zoom only)
 - Street Name
 - Structural and O&M grade for each pipe segment
 - Length in metres
 - Pre-cleaned
 - Purpose of Survey Inspection status
 - Indicate if this is a full PACP inspection, or just an isolated Investigation.
 - Additional Comments
 - Video Name – this column must contain all video file names by pipe segment
 - Indicate the reason why any assignment inspections were not completed
- The corresponding grade that is displayed should be based on the latest version of PACP/ MACP grading system.
- g) A video report including the pipe segment ID, video name (unique segment ID_date_time), and report name.
- h) Corresponding PDF inspection reports consisting of all pipe inspections with upstream and downstream views and their combined score and results of the inspections with commentary, pictures and diagrams must be included in a separate file.
- i) PDF names shall include:
- Pipe segment ID
 - Date
 - Time
- j) Completed variance report, if applicable. The variance report will consist of the following.
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- Project Number
- Activity (CCTV or Zoom)
- Date
- Technician
- Location (Street, From, To)
- Plan
- Notes (i.e., not found, doesn't exist anymore, etc.)

Data shall be configured according to the definitions and database structures included in OPSS 409. Video must be able to be viewed using the latest version of Windows Media Player and have the ability to use all features of the video player including fast forward capability.

32.10. BASIS FOR PAYMENT

Basis for payment requirements shall be in accordance with OPSS.MUNI 409 with the exception of the following.

Any deficiencies found by the Corporation shall be deemed as deficient until the required remedial action is undertaken by the Contractor. Once the required remedial action has been undertaken, the corporation shall require that the contractor request to have the deficient section of sewer reviewed again. This review shall be done at the Contractor's expense and submitted to the Corporation for review and acceptance.

Payment will be made at the contract unit price per unit upon submission of the CCTV report for the cleaning and CCTV report of the applicable sewers as stated in the tender documents.

There is no payment by the Corporation for PDC CCTV reports submitted for review to the City of Windsor.