

DISCLAIMER

This Standard Technical Specification was developed by Hunter Water to be used for construction or maintenance of water and/or sewerage works that are to become the property of Hunter Water. It is intended that the works be designed in accordance with Hunter Water's Water and Sewer Design Manual and that this Standard Technical Specification be used in conjunction with the Standard Drawings, other Standard Technical Specifications and requirements prepared specifically for each particular project. Hunter Water does not consider this Standard Technical Specification suitable for use for any other purpose or in any other manner. Use of this Standard Technical Specification for any other purpose or in any other manner is wholly at the user's risk.

Hunter Water makes no representations or warranty that this Standard Technical Specification has been prepared with reasonable care and does not assume a duty of care to you. Hunter Water has no responsibility to inform you of any matter relating to the accuracy of this Standard Technical Specification which is known to Hunter Water at the time of downloading or subsequently comes to the attention of Hunter Water.

This document is current at the date of downloading. Hunter Water may update this document at any time.

Copyright in this document belongs to Hunter Water Corporation.

Hunter Water Corporation A.B.N. 46 228 513 446
Standard Technical Specification for:

<p>CLOSED CIRCUIT TELEVISION INSPECTION OF SEWERS</p>
--

CONTENTS

1. GENERAL..... 1

1.1 Scope 1

1.2 Interpretation..... 1

2. EQUIPMENT 1

2.1 General 1

2.2 Camera 1

2.3 Transportation Unit 1

2.4 Distance Measuring Device 1

2.5 Illumination System..... 1

2.6 Data Display Generator 2

2.7 Video Cassette Recorder and Monitor 2

3. CLEANING..... 2

3.1 Requirements for Specific Projects 2

3.2 Pre-inspection Cleaning..... 2

3.3 Root Removal Cleaning..... 2

3.4 Full Cleaning..... 2

3.5 Descaling 2

3.6 Trapping and Removal of Debris..... 2

4. FLOW CONTROL 2

4.1 General 2

4.2 Plugging 2

4.3 Bypass Pumping..... 3

5. CCTV INSPECTION..... 3

5.1 Starting Point 3

5.2 Abandonment of the Inspection 3

5.3 Manholes Not Shown on Plans..... 3

5.4 Distance Measuring Device Audit..... 3

5.5 Picture Quality..... 3

6. VIDEO RECORDING AND DISPLAY 3

6.1 General 3

6.2 Video Tapes 3

6.3 Data Recorded on Tape 4

7. INSPECTION RECORDING AND REPORTING 4

7.1 General 4

7.2 Full Inspection Recording and Reporting 5

7.3 Exception Reporting 5

7.4 Photographs..... 5

7.5 Training..... 6

AMENDMENTS FROM THE PREVIOUS EDITION - APRIL 1997

Clause	Amendment
All	General formatting, rewording and referencing changes to improve clarity but no change to technical requirements

1. GENERAL

1.1 Scope

This Standard Technical Specification details requirements for the closed circuit television (CCTV) inspection of sewer pipelines to enable assessment of the structural and service condition and/or assessment of construction or remedial works.

1.2 Interpretation

Unless specifically stated otherwise, Closed Circuit Television Inspection includes ALL functions described in this Standard Technical Specification and the provision of any minor materials or services which are not described but are reasonably necessary to produce a visual record of the inspection and a report on the pipeline condition.

Headings are for the convenience of the reader and shall not be used in the interpretation of this Standard Technical Specification.

Unless the context requires otherwise any expression such as "give notice", "submit", "approval", or "directed" means give notice to, submit to, approval by, or directed by the person nominated by the Principal or Purchaser.

2. EQUIPMENT

2.1 General

Use equipment including a camera, transportation unit, distance measuring device, illumination system and video cassette recorder and monitor all in accordance with the following requirements. The equipment shall be capable of surveying the full length of the conduit between manholes or other defined access points and shall provide a clear, accurate and in-focus record of the conduit's internal condition.

2.2 Camera

Use a camera with remotely operated adjustment of the focus and iris to allow optimum picture quality to be achieved.

Position the camera to look along the pipeline located to reduce the risk of picture distortion with the lens centrally within circular or regular shaped conduits or, for an oviform conduit, two thirds of the vertical dimension of the conduit directly above its invert

2.3 Transportation Unit

Ensure that the means of transporting the cctv camera produces a stable condition for viewing and recording the condition of the conduit.

Unless directed otherwise to enable all details to be extracted from the video tape recording, limit the speed of the camera to no greater than 0.1 m/s for a conduit of less than DN 200, 0.15 m/s for DN 200 to DN 300 and 0.2 m/s for greater than DN 300.

2.4 Distance Measuring Device

Provide a suitable distance measuring device which enables the cable length to be accurately measured and displays on the cctv monitor an automatically updated record in metres and tenths of metres of the distance of the camera position from the set-up point at the start of the survey.

The device shall be accurate to + or - 1% or 0.3m whichever is greater.

2.5 Illumination System

The illumination shall be such as to allow an even distribution of light around the conduit perimeter without loss of contrast, flare-out of picture, or shadowing.

2.6 Data Display Generator

Provide a data generator to electronically generate and clearly display data in alpha-numeric form at the beginning of and continuously during each inspection. The information to be displayed is listed elsewhere in this Standard Technical Specification.

2.7 Video Cassette Recorder and Monitor

Provide a video cassette recorder and a monitor of suitable quality to allow clear and accurate viewing and recording of the inspection.

3. CLEANING

3.1 Requirements for Specific Projects

Only undertake cleaning of pipelines if the lengths to be cleaned and the level of cleaning are specifically stated for the particular project.

3.2 Pre-inspection Cleaning

If pre-inspection cleaning is specified, remove cobwebs and grease deposits along the entire length of pipeline to be inspected by making two passes, one in each direction, of a high velocity water jet.

3.3 Root Removal Cleaning

Also remove, by suitable means, any roots to restore the bore of the pipeline to 95% of its nominal bore and to enable the cctv camera to traverse the entire length of the pipeline to be inspected.

3.4 Full Cleaning

Also remove, by suitable means, any roots, debris, silt, sand, rocks, and grease to restore the bore of the pipeline to 95% of its nominal bore and to enable the cctv camera to traverse the entire length of the pipeline to be inspected.

3.5 Descaling

Also remove, by suitable means, hard deposits such as corrosion products or grout to restore the bore of the pipeline to the percentage of its nominal bore specifically stated for the particular project and to enable the cctv camera to traverse the entire length of the pipeline to be inspected.

3.6 Trapping and Removal of Debris

Trap all materials resulting from the cleaning operation in the downstream manholes. Remove all trapped materials and dispose of them off site in a manner acceptable to the Environmental Protection Authority of New South Wales and other relevant local authorities.

4. FLOW CONTROL

4.1 General

Do not undertake CCTV inspections if the depth of flow in the sewer exceeds 20% of the conduit diameter unless the depth is due to ponding in low areas of the line. If approved, flow may be reduced by plugging or diverted by bypass pumping.

4.2 Plugging

If flow is stopped or reduced by plugging, regularly monitor the build-up level in the upstream sewer. If necessary suspend the inspection and remove any plugs or initiate bypass pumping to prevent any overflow. Take particular care in the event of wet weather during which flows may increase substantially.

Only use plugs designed and manufactured for the purpose and installed and maintained strictly in accordance with the manufacturers recommendations. Install the plug in the upstream side of the manholes. For lines in excess of DN 400, hold the plug in position in a manner which will allow fast removal in the event of an emergency. Such methods of support include tying back with wire rope or chain from the next upstream manholes.

4.3 Bypass Pumping

Bypass pumping includes pumping to a mobile tanker or from an upstream to a downstream manhole. If directed submit details of the proposed method of pumping, pump type and capacity.

5. CCTV INSPECTION

5.1 Starting Point

Begin the inspection to allow observation of the very start of the pipeline conduit. Set the distance counter to zero at the start of the conduit.

5.2 Abandonment of the Inspection

If the inspection of a length of pipeline between adjacent manholes cannot be completed due to an obstruction, inspect the pipeline from each end up to the obstruction. Record data as two separate inspections and cross reference one to the other.

The inspection may be abandoned by agreement if the service condition of the pipeline makes inspection impractical or places the equipment at risk. Record the reasons for the abandonment on the inspection report.

5.3 Manholes Not Shown on Plans

If during the inspection, an manholes is found which is not shown on the plans, record its location and continue the inspection to the finishing manholes.

5.4 Distance Measuring Device Audit

On each day of the inspection demonstrate that the distance measuring device tolerance specified in clause "Distance Measuring Device" is being complied with by using a cable calibration device or tape measurement of the surface between the manholes / node. Complete a linear measurement audit form each day (Appendix A). Provide a new distance measuring device if the device fails to meet the specified tolerance. If directed in writing resurvey those lengths of conduit originally inspected with the deficient measuring device.

5.5 Picture Quality

Ensure that the picture quality is such as to provide a clear, sharp resolution for the video recording, photographs and monitor. In the event that picture quality is diminished by condensation, external deposits, malfunction of the equipment or any other condition, correct the fault and reinspect the pipeline length.

6. VIDEO RECORDING AND DISPLAY

6.1 General

Record the inspection so as to provide a visual record of the condition of the entire length of pipeline specified for inspection.

6.2 Video Tapes

Use unused new cassette tapes of one hour running time "Super High Grade Fuji" or equivalent half inch VHS.

Submit the cassette in a protective outer case with both the cassette and the outer case marked in ink with the;

- video tape number;
- date of inspections;
- name of client;
- name of firm undertaking the inspection and recording; and
- contract or order number.

On the protective case also include the;

- street and suburb of the inspection;
- start and finish manholes numbers;
- direction of inspection;
- whether the inspection was completed or abandoned;
- length of inspection in metres; and
- video counter reading at start of inspection.

6.3 Data Recorded on Tape

At the start of each pipeline length electronically generate and record the;

- date and time of inspection;
- name of client;
- name of firm and operator undertaking the inspection;
- start and finish manholes reference number;
- street and suburb for starting manholes;
- pipe diameter and material;
- video tape number; and
- viewing direction.

Continuously during the inspection electronically generate and record;

- automatic update of the camera's position within the pipeline relative to the start;
- pipe diameter;
- start and finish manholes reference numbers; and
- date of inspection.

Size and locate the data display such that it does not interfere with the main subject of the picture.

7. INSPECTION RECORDING AND REPORTING

7.1 General

Inspection recording and reporting is required in addition to the provision of a video recording. Two levels of recording and reporting are described in clauses "Full Inspection Recording and Reporting" and "Exception Reporting". Undertake full recording and reporting or exception reporting as specified for the specific project. If no level is specified, undertake full recording and reporting.

7.2 Full Inspection Recording and Reporting

Record and present inspection data in accordance with the format specified in the Australian Conduit Condition Evaluation Manual published by the Operations Policy and Performance Review Unit of the Water Board, Sydney.

All dimensions are to be in metric and all levels to Australian Height Datum.

Record data observed during the inspection either directly into hand held or personal computers using data capture software or on site coding sheets for later input to computer software. Use a separate coding sheet for each pipeline length inspected. Record inspections continuously from the starting manholes to the finish manholes.

If inspections are continued through an manholes reset the distance measurement to zero at the manholes and treat it as a separate inspection unless the manholes was not shown on the plans.

Submit a 3.5" computer disk containing the recorded sewer inspection data and one bound copy of each final report containing:

- a computer generated report (log sheet) of each pipeline length inspected
- photographs as specified in clause "Photographs"
- a set of drawings showing manholes and details of pipelines inspected suitably highlighted to show the inspected sewers

7.3 Exception Reporting

Submit the photographs as specified in clause "Photographs" accompanied with a summary report of the defects photographed comprising a table listing;

- street and suburb
- starting and finish manholes reference numbers
- size of the pipeline
- distance to the defect
- description of the defect
- age of the pipeline

7.4 Photographs

Take photographs of the internal condition of the pipeline where the following defects are identified:

- collapsed, deformed or broken pipe
- multiple fractures of the pipe
- significant erosion, gas attack or surface damage
- defective junction or connection
- significant infiltration
- whenever an inspection is abandoned

Where significant continuous defects exist, take photographs to represent typical defects over the particular length.

The photographs must clearly and accurately depict the subject feature, be approximately 100 mm x 75 mm and may be taken off the screen or video print photographs.

Clearly identify photographs with manholes start and finish numbers, distance and date when taken using type printing of figure size no greater than 5 mm and positioned so as not to interfere with the subject of the photograph.

7.5 Training

Personnel responsible for identifying and recording defects and preparing reports shall be fully skilled and trained in picture interpretation, defect coding and classification and Australian standards of reporting.

[END OF STS901]