

1859 CCTV INSPECTION OF DRAINAGE CONDUITS
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1 GENERAL**1.1 RESPONSIBILITIES****General**

General: Provide CCTV inspection and reporting of stormwater drainage and sewerage conduits and related maintenance structures, as documented and in conformance with **ANNEXURE - SCOPE OF CCTV INSPECTION**.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0135 General requirements (Services).
- 0153 Schedules - period supply and service.
- 1101 Control of traffic.
- 1851 Clear open space and drains.
- 1852 Clear open space drainage culverts.
- 1853 Clear road reserve culverts and pits

~~—[complete/delete]~~

1.3 REFERENCED DOCUMENTS**Standards**

General: The following document is incorporated into this worksection by reference:

Other publications

IPWEA - Institute of Public Works Engineering Australia

Practice Note 5 – 2011 Stormwater drainage

WSAA - Water Services Association of Australia

WSA 05 v3.1 – 2013 Conduit inspection reporting code of Australia

1.4 STANDARD**General**

Code: To WSA 05.

1.5 INTERPRETATION**Abbreviations**

General: For the purposes of this worksection the following abbreviations apply:

- ADAC: Asset Design As Constructed.
- CCTV: Closed Circuit Television.
- FMP: Flow Management Plan.
- WHS: Work Health and Safety.

Definitions

General: For the purposes of this worksection the definitions given in WSA 05 apply.

1.6 SUBMISSIONS**Flow management plan**

Requirement: Submit the FMP, in conformance with **FLOW MANAGEMENT**.

Submission time: A minimum of 5 working days before starting a CCTV inspection at any location.

Qualifications

Requirement: Submit evidence of operator's qualifications, in conformance with **OPERATOR TRAINING**.

Submission time: A minimum of 5 working days before starting CCTV inspection at any location.

Report

Inspection results: Submit inspection reports, in conformance with **Inspection report**.

Submission time: A maximum of 5 working days from completion of the first CCTV inspection and a maximum of 10 working days for subsequent inspections.

Urgent issues: Immediately after completion of the field investigation submit details of any defects nominated as requiring immediate notification, in conformance with **Immediate notification**. Provide the Principal with the option of a site visit whilst the camera is still on site.

Work health and safety plan

Requirement: Submit the WHS plan, in conformance with **WHS plan**.

Submission time: A minimum of 2 working days before starting a CCTV inspection at any location.

2 PRE-INSPECTION PLANNING

2.1 DRAINAGE NETWORK**Asset information**

General: For conduits and maintenance structures to be inspected the following information is provided:

- A plan/map of the network, to scale, including node and conduit locations, node numbers, street names and property boundaries.
- Size, material, class and flow direction of conduits.
- Coordinates, depth, surface and invert levels of nodes.
- Dates of construction - Age.
- Asset names or descriptors.
- Critical flow patterns and any pumped discharges.
- Any isolation or flow control measures relating to the network.

Access

Location: Confirm location of access maintenance structures based on the asset information obtained.

Traffic impact: Do not use access maintenance structures which are located under road surfacing or at heavy traffic junctions, if possible. Complete CCTV inspection from adjacent maintenance structures.

Notification: Provide minimum notice of 1 full working day of any required access locations which are inaccessible on Council property and a written notice to the owner/occupier before accessing any maintenance structures on private property, with the format and timeframe for such notice to be in conformance with relevant State legislation and local laws.

Identification: Always carry the Council/Municipality/Utility identification provided.

2.2 OPERATOR TRAINING**Qualifications**

Requirement: Use operators trained and qualified with certified competence in conformance with WSA 05 clause 2.2.1 to conduct CCTV inspections, identify defects and report on condition of conduits and related maintenance structures. For stormwater

assets the operators must also read the guidelines in IPWEA *Practice Note 5 – Stormwater drainage*.

2.3 CLEARING AND CLEANING

General

Requirement: If clearing or cleaning of the conduit and maintenance structures prior to inspection is requested, conform to *1851 Clear open space and drains*, *1852 Clear open space drainage culverts* or *1853 Clear road reserve culverts and pits* as appropriate.

2.4 WORK HEALTH AND SAFETY

WHS plan

Requirement: Prepare a WHS plan for the CCTV inspection works including safe work method statements for each inspection location, in conformance with State regulatory requirements.

Confined spaces

General: Make sure all staff entering any confined space have completed the necessary confined space training, and are provided with the necessary safety equipment, required by State WHS regulation.

2.5 FLOW MANAGEMENT

General

Timing: Where possible, plan to carry out CCTV inspections during dry weather for stormwater conduits and during periods of predicted low flow for sewerage conduits.

FMP: If it is anticipated that flows within the conduit will require management for a successful CCTV inspection, prepare a FMP detailing how normal dry weather and wet weather flows will be managed.

Flow storage

Upstream: Where storage of flows within the network can be safely achieved upstream of the inspection location, detail the following in the FMP:

- Management resources.
- Monitoring procedures of upstream storage/flow levels.
- Procedures to manage any sudden rises in storage/flow levels.
- Systems in place to make sure that, where plugs are used, they cannot be displaced in a situation where they deflate.

Flow diversion

By-pass pumping: If storage of flows within the network cannot be safely achieved, use by-pass pumping to divert flows past the area of inspection. Detail how the by-pass pumping will be installed, managed and operated in the FMP and include the following information:

- Proposed pumping access points.
- Identification of each point of inflow into the conduit to be inspected.
- Proposed equipment and provision of back-up equipment.
- Procedures for monitoring the equipment in operation.
- Control of noise and public safety.
- Anticipated duration of pumping activities.
- Procedures for dealing with any spillage/leakage which may occur.

3 EQUIPMENT

3.1 CCTV CAMERA

General

Standard: To WSA 05 clause 2.5.1.

Camera type: Use a camera to suit the specific conduit diameter and required picture quality.

Capability and quality

Requirement: Use cameras which conform to the following:

- Capability (Manoeuvrability): To WSA 05 clause 2.5.2.
- Picture quality: To WSA 05 clause 2.5.3.

4 EXECUTION

4.1 PROVISION FOR TRAFFIC

General

Requirement: Conform to *1101 Control of traffic*.

4.2 REQUIRED DOCUMENTATION

General

Requirement: The CCTV operator and inspection reporter/coder must have a copy of this specification and WSA 05 available at all times during inspection and coding.

4.3 CAMERA OPERATION

Camera position

Requirement: Position camera centrally within the conduit or maintenance structure in conformance with the tolerance requirements of WSA 05 clause 2.6.1.

Camera travel speed

Maximum: Manoeuvre the camera at no greater than the maximum speed documented in WSA 05 clause 2.6.2.

Camera pan

Restriction: Do not pan the camera whilst the camera is moving. At a defect or feature, stop the forward camera movement and then pan or rotate the camera, to conform to WSA 05 clause 2.6.2.

4.4 INSPECTION PROCEDURE

General

Asset data: Confirm that the conduit material and size conforms to any asset data obtained before starting the inspection. Identify and record any asset data which contradicts previous asset data obtained.

Inspection

Maintenance structures: Inspect, observe and record any features or defects of the maintenance structures at the start and end of the inspection. Also include any intermediate maintenance structures, not previously documented in the obtained asset data.

Start of conduit: Position camera at the face of the maintenance structure (conduit invert) and inspect the start of the conduit. Rotate the camera through 360°, paying particular attention to the 3, 6, 9 and 12 o'clock positions for the start of any longitudinal cracks or fractures. Record start node and water level codes to WSA 05.

End of conduit: Complete the same 360° inspection at the end of the conduit length. Record an inspection closing code to WSA 05.

Conduit joints: When defects are visible upon approach to a joint, complete the same 360° inspection at those joints.

Observation

Record: Record observed features or defects, which extend over a length greater than 1 m, as a continuous code. Define the continuous code by recording the start and finish linear measurement of the defect from the longitudinal reference point. Record defects or observations affecting less than 1 m of the conduit length as a non-continuous defect.

Camera vision

Clean lens: If the lens of the camera becomes obscured, preventing a clear view of the conduit and potential defects, pause the inspection and clean the lens. If the camera needs to be removed to clean the lens, the inspection can be resumed at the location where the inspection was paused. The video however must be a single video record.

Completion

Covers: Correctly reinstate all maintenance structure covers at the completion of the field CCTV inspection.

4.5 LINEAR MEASUREMENT

General

Standard: To WSA 05 clause 2.7.

Levels: Record all levels to Australian Height Datum (AHD). If a reference level is not available, record relative levels from the centre of the cover to the maintenance structure at which the inspection is to start.

Longitudinal reference point

Zero measurement: Set the longitudinal reference point as the centre of the maintenance structure at which the inspection is to start. The start linear measurement is the distance from the centre of the maintenance structure to the face of the maintenance structure.

Finish point: Finish the inspection at the corresponding reference point in the target maintenance structure, unless inspection has to be abandoned.

Alternative: If the centre of the maintenance structure cannot be accurately determined, set the longitudinal reference point in conformance with WSA 05 clause 3.5.4.5.

4.6 MAXIMUM DEPTH OF FLOW

In-service assets

General: Pause or terminate any inspection if the maximum depth of flow values stated in WSA 05 Table 2.1 are exceeded. Conform to the requirements of WSA 05 clause 2.11.

4.7 RECORDING WATER LEVEL

General

Water level: Record the water level of stagnant (ponding) water or water flowing at a constant depth at the start of the inspection. Do not record water flowing at fluctuating depths as a water level. Record water level and changes in water level to WSA 05 clause 3.7.8.3, Quantification 1.

Sagging

Sag: Record the water level to WSA 05 clause 3.7.8.3, Quantification 1, where the water level is increasing due to a sagging conduit. Terminate the inspection if the camera becomes submerged, unless the camera will become unsubmerged in a short distance.

5 REPORTING

5.1 GENERAL

Inspection report

Requirement: Prepare a report of the CCTV inspection in conformance with WSA 05 clause 2.12.1, WSA 05 Appendix A ~~and as follows:~~

- ~~—Report file type: [complete/delete]~~
- ~~—Report format: [complete/delete]~~
- ~~—Photographs of features/defects: [complete/delete]~~
- ~~—Still image file type: [complete/delete]~~
- ~~—Still image format: [complete/delete]~~
- ~~—Video clips of features/defects: [complete/delete]~~

Video record

Data display: During video playback, display data, superimposed on the image, to satisfy the requirements of WSA 05 clause 2.8. For conduits also include the following data:

- Direction of view (a dial, mimic or graphical indicator showing the camera's position with respect to the angle/circumferential direction of view). If camera does not have capability to record the direction of view, record the angle of view in conformance with WSA 05 clause 3.7.9.4.
- Conduit asset reference number.

~~Video file type: [complete/delete]~~

~~Video format: [complete/delete]~~

Drawings

Requirement: Provide electronic format drawings, included in the inspection report, conforming to the ADAC methodology.

5.2 OBSERVATION CODING

Conduit inspection

Reporting: When describing and encoding all observations from the CCTV inspection, conform to the requirements and codes in WSA 05 Section 3.

Header information: Record the mandatory information required by WSA 05 clause 3.4.2.

~~Optional information: [complete/delete]~~

Maintenance structure inspection

Reporting: When describing and encoding all observations from the CCTV inspection, conform to the requirements and codes in WSA 05 Section 4.

Header information: Record the mandatory information required by WSA 05 clause 4.4.2.

~~Optional information: [complete/delete]~~

Immediate notification

Requirement: Upon completion of the field investigation, immediately notify the Principal of any observed defect that may warrant immediate investigation by the Principal, or if any of the following defect codes were observed:

~~—[complete/delete]~~

Scoring of defects

General: Score each defect and grade the apparent condition of the asset, in conformance with the relevant WSA 05 Appendices, as follows:

- Appendix C – Sewers.
- Appendix D – Stormwater.
- Appendix E – Maintenance structures.

ANNEXURE - SCOPE OF CCTV INSPECTION

Inspection location:

- **Area:** _____
 - **Start:** _____
 - **End:** _____
-

**Reason for inspection
and scope of works:** _____

Inspection exclusions

~~The following defects/features can be excluded from the CCTV inspection reporting:
—[complete/delete]~~

Existing asset information

Data on existing assets has been made available to Contractors in conformance with WSA 05 clause 2.3, clause 3.4.4 and clause 4.4.4:

Yes No (see below)

The following asset data is not available:

Pre-cleaning/Obstruction removal

Before starting the CCTV inspection the Principal requires the following:

~~—[complete/delete]~~