

21 Drainage Systems

21.1 Scope

This Section sets out the requirements for maintaining **drainage systems**.

The work required includes the **maintenance** of all **drainage** facilities except for the following:

- a) sump cleaning within urban areas
- b) the **maintenance** of **culverts**, sumps and associated leads, catchpits etc within Urban Areas
- c) **side drain maintenance**.
- d) **culverts** with a waterway area greater than 3.5 m².

21.2 Definitions

Terms defined in Table 3.2, Definitions appear in **bold**.

21.3 Cyclic Inspections

The Contractor must develop and implement an inspection and cleaning **programme** that:

- a) minimises the likelihood of faults forming
- b) ensures all **stormwater structures** are inspected and, if required, cleaned at least once every six months.

21.3.1. Inspection Reports

The Contractor must submit the **Drainage System** Inspection Report within 2 months of the Date of **possession of site** and after that at 6 monthly intervals.

21.4 Response Times

21.4.1. Stormwater Structure Fault Repair

In the event of complete blockage of **drainage** facilities, Table 21.1 states the response times for clearing **stormwater structure** blockages. These response times apply from the time of **notification** of the blockage.

Table 21.1: Stormwater Structures	
Class	Response Time
M and U	3 Days
R1	3 Days
R2	3 Days
R3	6 Days
R4	6 Days

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For the remaining faults and deficiencies identified during the 6 monthly inspections, the Contractor shall prepare a **programme** of work for the Engineer's approval. The same constraints apply to this **programme** as is detailed in Section 4.

21.4.2. Other Drainage Systems

Other **drainage systems** included in Appendix 21.1, the Operational Requirements or as agreed with the Engineer, for example cleaning **side drains**, must be completed within the time frame and to the standard agreed with the Engineer.

21.5 Specific Requirements

21.5.1. Routine Drainage Maintenance

Routine drainage system maintenance includes regular inspections, defect reporting, blockage and fault clearing and maintaining, **notification** of **damaged** and missing **culvert** markers and **culvert** numbers and subsoil drain markers to the Engineer. This work includes identification and maintenance of all **drainage features**, including fault reporting and **drainage features** that form part of the **drainage system** but are not included in the **drainage system inventory**.

21.5.1.1. Exclusions to Routine Drainage Maintenance

The work does not include:

- a) **damage** repairs
- b) emergency works.

21.5.1.2. Other Drainage Systems

Appendix 21.1 details the locations of other **drainage systems** requiring routine **drainage maintenance**. The Operational Requirements may include details of the extent of this **maintenance**.

21.5.2. Faults

For sumps, and catchpits and like features, a fault exists if the **detritus** is within 200mm of the outlet pipe invert.

For **manholes** and like features, a fault exists if more than 10% of the outlet pipe entry area is covered with **detritus**.

For **culverts**, including **culverts** under accessways, a fault exists when more than 10% of the depth of the **culvert** inlet, outlet, or barrel along its entire length, is filled with **detritus**.

For **side drains**, if included in the contract, a fault exists if water ponds and/or water does not readily flow to the outlet points.

21.5.3. Fault and Inspection Reporting

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The Contractor must review, update and submit the **Drainage System** Inspection Report within the response times stated in Clause 21.3.1. This work includes identifying and reporting **drainage features** that form part of the **drainage system** but are not included in the current **drainage system inventory**.

The current report will be provided to the Contractor at the initial meeting.

The report must be submitted in both electronic and hard copy format agreed with the Engineer.

21.6 Cleaning

Stormwater structures excluding **culverts** are deemed to be clean when 90% of the waterway area is clear of **detritus** throughout the length of the structure, and this standard shall be maintained wherever practicable throughout the Contract.

Culverts including accessway **culverts** are deemed to be clean when less than 10% of the depth of the **culvert** inlet, outlet or barrel, along its entire length, is filled with **detritus**.

Stormwater structures shall be cleaned, where possible, in conjunction with each inspection.

Detritus shall be removed from **stormwater structures** so that the normal water flow is maintained.

All wood debris jammed within structures must be removed. Care shall be taken so that **stormwater structures** or their linings are not **damaged** during cleaning operations. **Damage** arising from the Contractor's methods of work shall be remedied at the Contractor's expense.

The **channel** area within five metres of **culvert** inlets and outlets shall be cleaned. **Culvert** inlet and outlet structures, such as headwalls, and the areas immediately adjacent to these, shall also be cleaned.

The inverts of sumps and **manholes**, their **gratings**, **covers**, seatings and outlet pipes (first 150mm) shall be cleaned. Care shall be taken during cleaning not to push any **detritus** into outlet pipes.

21.6.1. Detritus Removal from Site

When undertaking cleaning and maintenance of **drainage features**, all **detritus** shall be completely removed from the site of the works and disposed of at an approved disposal site.

21.7 Performance Requirements

The performance of the Contractor during the contract period will be measured by the following criteria:

- a) That all blockages are cleared within the response times in Table 21.1
- b) inspections are completed on time and inspection records are available when requested by the engineer
- c) inspections are completed within the specified frequencies

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- c) that all repair of faults are carried out in accordance with this Specification by the date shown on the agreed **programme**, within the response times stated and that all **stormwater structures** remain clean. .
- d) that no **damage** to existing **stormwater structures** or adjacent roading features is caused by the Contractor's operation. **Damage** arising from the Contractor's methods of work shall be remedied at the Contractor's expense.
- e) that **drainage** inspections are carried out to the frequency required, and accurate inspection reports are submitted to the Engineer within the specified timeframes.