

Operation & Maintenance Plan for Sustainable Drainage Systems

Crow Trees Farm, Chatburn
Plots 1 - 37

Pringle Homes

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1 INTRODUCTION

1.1 BACKGROUND

R. G. Parkins & Partners Ltd (RGP) has been appointed by Pringle Homes to provide an Operation and Maintenance plan for surface water drainage systems for the housing development at Crow Trees Farm in Chatburn. This covers the 37no. new build plots.

In reviewing the enclosed information, reference should be made to the latest revisions of the following RGP drawings:

- K39346-20 Foul & Surface Water Drainage Plan
- K39346-21 Foul & Surface Water Drainage Construction Details (1 of 2)
- K39346-22 Foul & Surface Water Drainage Construction Details (2 of 2)

1.2 SUDS COMPONENTS

The housing development at Crow Trees Farm, utilises Sustainable Drainage Systems (SuDS) as part of the overall surface water drainage strategy for the site.

All drainage systems have been designed to provide sufficient storage for the critical duration, 1 in 100-year design storm event with a 50% allowance for the future effects of climate change. All SuDS components will remain private and will be maintained by the Registered Provider, Mosscares St Vincent's Housing ("MSV") who will be responsible for the maintenance of the relevant SuDS components, including full rights of access and maintenance, particularly in relation to the outfall and associated infrastructure (e.g. S09–S11 and F07–F10) where this crosses private land (e.g. the farm track) in perpetuity. MSV Housing has rights over the shared driveway to maintain and renew the drainage infrastructure as required.

These SuDS components are described below.

Plot 1 - 37

All surface water runoff associated with Plots 1 – 37 will be conveyed into a single geocellular attenuation tank located in front of Plots 26 – 37 in the south-east corner of the site. The tank will be situated underneath the access road and car parking areas. Silt traps will be located upstream of the tank to provide surface water treatment and access for maintenance. The tank will discharge into a flow control chamber utilising a vortex flow control device to restrict flows to a max. 10.4 lit/sec. Attenuated flow will then be conveyed to the north via a new surface water sewer through the existing farm access road with discharge into the existing United Utilities public combined sewer via a new manhole in Crow Trees Brow.

2 OPERATION AND MAINTENANCE REQUIREMENTS

As with all traditional drainage systems, SuDS need to be inspected and maintained regularly to ensure that they operate correctly and efficiently. If SuDS are not properly maintained, then there is a risk that the components become overloaded during periods of prolonged heavy rainfall potentially resulting in localised flooding within the development. Recommendations for the maintenance of the SuDS components are detailed in the following section.

As part of this process, it is recommended that inspection and maintenance records are retained by the Registered Provider (MSV Housing) to track the progressive performance of the SuDS over time. The inspection records should include the following:

- Sediment condition and depth
- Water observations (sheen, smell, etc.)
- Unscheduled maintenance needs
- Components that do not meet performance criteria and require immediate maintenance
- Common problem areas, solutions and general observations
- Aesthetic conditions

For Health and Safety reasons as well as practicality, SuDS systems should be maintained during periods of dry weather wherever possible. Adhering to the recommended maintenance regimes outlined below will minimise the risk of maintenance activities being required when a fault becomes apparent, usually during a rainfall event.

All maintenance activities should be detailed in the Health and Safety Plan and a risk assessment should be undertaken in accordance with CDM regulations. An example of a SuDS maintenance inspection proforma is included in Appendix A for reference (see Table B.25 from The SuDS Manual^[1]).

2.1 TIMETABLE FOR IMPLEMENTATION

The principal contractor appointed by Mossclare St Vincent's Housing ("MSV") is Pringle Executive Homes Ltd. The construction programme for the development is a live document and will continue to be updated as works progress on site. The current programme assumes the following:

- Start on site – January 2025
- Enabling works, drainage installation and access road construction – 3 months – completed April 2025
- Completion of all site works and handover to Mossclare St Vincent's Housing ("MSV") – September 2026

2.2 MAINTENANCE RESPONSIBILITY

During the construction phase, responsibility for maintaining and protecting the drainage system and associated geocellular attenuation tanks will remain with Pringle Executive Homes Ltd. Following handover, all operations and maintenance responsibility will transfer to Mossclare St Vincent's Housing ("MSV") in perpetuity. The Registered Provider (MSV Housing) is responsible for the maintenance of the relevant SuDS components, including full rights of access and maintenance, particularly in relation to the outfall and associated infrastructure (e.g. S09–S11 and F07–F10).

2.3 FINANCIAL MANAGEMENT SYSTEM

Geocellular tank manufacturers typically recommend a 60 year design life on this type of system, but as the tank is buried and not exposed to UV radiation, it can be anticipated that the system could last for 120 years. MSV Housing include life-cycle costing into their financial appraisals which estimates when key components need replacing, plus a cost to replace it. The performance of the attenuation tank and associated upstream/downstream pipework will be continuously monitored by MSV Housing during its design life and appropriate repairs and replacement work undertaken as required.

2.4 CONTACT DETAILS IN EVENT OF SYSTEM NOT WORKING CORRECTLY

Mossclare St Vincent's Housing ("MSV") contact details:

- Gareth Eadsford – Director of Asset Operations
- Email: [REDACTED]
- Telephone: [REDACTED]
- Mobile: [REDACTED]

2.5 MEANS OF ACCESS

The geocellular attenuation tanks and associated upstream and downstream pipework are primarily located beneath private access roads and shared driveways, allowing easy access for inspection of manholes, inspection chambers, and tank turrets.

2.6 GEOCELLULAR ATTENUATION STORAGE SYSTEMS & FLOW CONTROL CHAMBERS

Regular inspection and maintenance is important for the effective operation of below ground storage systems. The geocellular tanks will be protected from sediment loads by the use of upstream silt traps with sumps. The highest risk of blockage and siltation is during and immediately after construction. The geocellular tanks will be fitted with access turrets to allow inspection and maintenance of the inside of the tank.

The attenuation systems will discharge into a flow control chamber with a flow regulator device to reduce flows. The flow control device will require little, if any, maintenance and has a design life in exceedance of the upstream drainage systems. In the unlikely event that the device blocks and the flow control chamber floods the device is fitted with a pivoting by-pass door which can be accessed and opened from ground level via a pull handle and operating steel rope. This will allow the chamber to be drained down to provide access for maintenance. Crown Water Ltd provides guidance for the operation and maintenance of their flow control devices, a copy of which is included in Appendix B.

Maintenance responsibility for the geocellular tanks and flow control chambers will be by the Registered Provider, MSV. The following requirements outlined in Table 2.1, refer to the recommendations in The SuDS Manual (CIRIA C753) [1].

Table 2.1 Attenuation Storage Maintenance Activities and Schedule

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Inspect and identify any areas upstream of the system that are not operating correctly (i.e. rainwater pipe gullies, silt traps, inspection chambers). If required, take remedial action	Monthly for first 3 months, then six monthly thereafter
	Remove debris from any upstream catchment surfaces (may cause risks to performance)	Monthly for first 3 months, then six monthly thereafter (and after large storm events)
	Remove sediment from pre-treatment structures	Annually, or as required.
	Visual inspection of silt traps, access turrets and flow control chamber to ensure no obvious build-up of silt or other blockages. De-silt as required. Check to ensure there is no standing water in the chambers	Monthly for first 3 months, then six monthly thereafter (and after large storm events)
	Inspect external vent pipe and associated pipework to ensure free from blockage or damage	Annually, or as required
Remedial actions	Repair/rehabilitation of inlets, outlets and vents. De-silt as required.	As required
Monitoring	Inspect/check all upstream drainage inlets, outlets, vents and gullies to ensure that they are in good condition and operating effectively. Inspect access turrets and de-silt inside of tank if required	Monthly for first 3 months, then six monthly thereafter (and after large storm events)
	Survey inside of tank for sediment build up and remove if necessary	Every 5 years or as required.

3 REFERENCES

- [1] CIRIA, *The SuDS Manual*, Report C753, 2015.

APPENDIX A

EXAMPLE OF SUDS MAINTENANCE INSPECTION CHECKLIST

General information								
Site ID								
Site location and co-ordinates (GIS if appropriate)								
Elements forming the SuDS scheme				Approved drawing reference(s)				
Inspection frequency				Approved specification reference				
Type of development				Specific purpose of any parts of the scheme (eg biodiversity, wildlife and visual aspects)				
Inspection date								
	Details	Y/N	Action required	Date completed	Details	Y/N	Action required	Date Completed
General inspection items								
Is there any evidence of erosion, channelling, ponding (where not desirable) or other poor hydraulic performance?								
Is there any evidence of accidental spillages, oils, poor water quality, odours or nuisance insects?								
Have any health and safety risks been identified to either the public or maintenance operatives?								
Is there any deterioration in the surface of permeable or porous surfaces (eg rutting, spreading of blocks or signs of ponding water)?								
Silt/sediment accumulation								
Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains or infiltration basins and within proprietary devices)? If yes, state depth (mm) and extent. Is removal required? If yes, state waste disposal requirements and confirm that all waste management requirements have been complied with (consult environmental regulator)								
Is surface clogging visible (potentially problematic where water has to soak into the underlying construction or ground (eg underdrained swale or infiltration basin)?								
Does permeable or porous surfacing require sweeping to remove silt?								
System blockages and litter build-up								
Is there evidence of litter accumulation in the system? If yes, is this a blockage risk?								
Is there any evidence of any other clogging or blockage of outlets or drainage paths?								
Vegetation								
Is the vegetation condition satisfactory (density, weed growth, coverage etc)? (Check against approved planting regime.)								
Does any part of the system require weeding, pruning or mowing? (Check against maintenance frequency stated in approved design.)								
Is there any evidence of invasive species becoming established? If yes, state action required								
Infrastructure								
Are any check dams or weirs in good condition?								
Is there evidence of any accidental damage to the system (eg wheel ruts)?								
Is there any evidence of cross connections or other unauthorised inflows?								
Is there any evidence of tampering with the flow controls?								
Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity and visual aspects? (Specify.)								
Other observations								
Information appended (eg photos)								
Suitability of current maintenance regime								
Continue as current								
Increase maintenance								
Decrease maintenance								
Next inspection								
Proposed date for next inspection								

APPENDIX B

CROWN WATER FLOW CONTROL DEVICE OPERATION & MAINTENANCE GUIDE

Crown Water Vortex Flow Control (Radial and Conical) **Operation and Maintenance Instructions**

Operation

The Vortex Flow Control unit is a Water Regulator.

It is entirely self-activating and requires no manual intervention.

Maintenance

The unit requires no routine maintenance.

In the event of the blockage, it can be removed after the system has been drained down by pulling on the lifting cable located at the access.

Inspection

The chamber containing the unit should be inspected in line with normal practice. Any debris or silt should be removed.

Any visible fixing bolts should be checked.

If an internal blockage is suspected, the vortex flow control unit can be removed and inspected internally through the inlet or outlet hole.

If the unit has been removed, it must be replaced to its original location and securely fitted before the unit becomes operational.