R G PARKINS
Meadowside | Shap Road | Kendal | Cumbria | LA9 6NY
Tel:01539 729393
Email: mail@rgparkins.com

Operation & Maintenance Plan for Sustainable Drainage Systems

Crow Trees Farm, Chatburn

Pringle Homes

Ref: K39346.OM/004

Version	Date	Prepared By	Checked By	Approved By
Original	22nd March 2024	[redacted]	[redacted]	[redacted]

Registered Office: RG Parkins & Partners Ltd, Meadowside, Shap Road, Kendal, LA9 6NY
Registered in England & Wales - Company number 04107150

INDEMNITIES

This report is for the sole use and benefit of Pringle Homes and their professional advisors. RG Parkins & Partners Ltd will not be held responsible for any actions taken, nor decisions made, by any third party resulting from this report.

RG Parkins & Partners Ltd are not qualified to advise on contamination. Any comments contained within this report with regards to contamination are noted as guidance only and the Client should appoint a suitably qualified professional to provide informed advice. The absence of any comments regarding contamination does not represent any form of neglect, carelessness, or failure to undertake our service.

COPYRIGHT

Registered Office: RG Parkins & Partners Ltd, Meadowside, Shap Road, Kendal, LA9 6NY
Registered in England & Wales - Company number 04107150

CONTENTS

TABLES

Registered Office: RG Parkins & Partners Ltd, Meadowside, Shap Road, Kendal, LA9 6NY
Registered in England & Wales - Company number 04107150

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.

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 Housing Association.

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.

Barn Conversion

Surface water run-off from the new barn conversion and associated new access road, garage and outbuiliding will be conveyed into a separate geocellular attenuation tank located below the new driveway. 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. 0.2 lit/sec. Attenuated flow will then be conveyed into the new surface water sewer through the existing farm access road.

Registered Office: RG Parkins & Partners Ltd, Meadowside, Shap Road, Kendal, LA9 6NY
Registered in England & Wales - Company number 04107150

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 Housing Association 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.

2.1 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 Hydrobrake device to reduce flows. The Hydrobrake 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. Hydro International Ltd provides guidance for the operation and maintenance of their flow control devices, a copy of which is included in Appendix A.

Maintenance responsibility for the geocellular tanks and flow control chambers will be by the Housing Association. 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 form 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: MAINTENANCE REQUIREMENTS

FOR HYDRO-BRAKE

Registered Office: RG Parkins & Partners Ltd, Meadowside, Shap Road, Kendal, LA9 6NY
Registered in England & Wales - Company number 04107150

HYDRO-BRAKE® FLOW CONTROL

MAINTENANCE AND SAFETY DATA SHEET

MAINTENANCE

Normally, little maintenance is required as there are no moving parts within the Hydro-Brake® Flow Control. Experience has shown that if blockages occur they do so at the intake, and the cause on such occasions has been due to a lack of attention to engineering detail such as approach velocities being too low, inadequate benching, or the use of units below the minimum recommended size. Hydro-Brake® Flow Controls are fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur. The smaller type conical units, below the minimum recommended size, are also available with rodding facilities or vortex suppressor pipes as optional extras.

Following installation of the Hydro-Brake® Flow Control it is vitally important that any extraneous material ie. building materials are removed from the unit and the chamber. After the system is made live, and assuming that the chamber design is satisfactory, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. If problems are experienced please do not hesitate to contact the company so that an investigation may be made.

Hydro-Brake® Flow Controls are typically manufactured from grade 304 Stainless Steel which has an estimated life span in excess of the design life of drainage systems.

COSHH

Hydro-Brake® Flow Controls are manufactured from Stainless Steel, which is not regarded as hazardous to health and exhibits no chemical hazard when used under normal circumstances for the stated applications.

MANUAL HANDLING

The handling of Hydro-Brake® Flow Controls should be in accordance with current legislation and regulations:

- The Health and Safety at Work etc. Act 1974.
- The Management of Health and Safety at Work Regulations 1999 (amended 2003).
- The Manual Handling Operations Regulations 1992 (amended 2002).

All published and printed by the Health and Safety Executive.

turning water around …®

Hydro International (UK) Ltd
Stormwater Division • Shearwater House • Clevedon Hall Estate • Victoria Road • Clevedon • BS21 7RD
Tel: 01275 878371 • Fax: 01275 874979 • www.hydro-international.biz

Registered in England No. 1474012 Registered Office: as above
A subsidiary of Hydro International plc