



123 Broadhurst Gardens, NW6

SuDS Maintenance Report



Revision	Report Name	Date	Comment	By
F1	1149-SUDSMR-180730	30.07.18	Issued for Information	S.Kanadia

Table of Contents

1. Executive Summary.....	1
2. Introduction	2
3. Background to Drainage	3
4. Adoption	3
5. Maintenance of SuDS.....	4
6. SuDS Devices	4
7. Mechanism for Contract to Maintain	6
8. Conclusion and Recommendations.....	7

1. Executive Summary

1.1 Objectives

- 1.1.1 Spillways Ltd have been appointed to prepare a Sustainable Drainage (SuDS) Maintenance Report in support of the proposed development at 123 Broadhurst Gardens in London.
- 1.1.2 A surface water management plan has also been produced and should be read in conjunction with this report [1149-SWMP-180420-F4]
- 1.1.3 This report has been based on readily available existing information, including the Ciria C697 – The SuDS Manual and Department for Environment, Food and Rural Affairs (DEFRA) website.
- 1.1.4 This report aims to provide the reader with a broad overview of the SuDS devices as indicated in the drainage strategy for 123 Broadhurst Gardens project and the nature of anticipated maintenance works required.
- 1.1.5 No costing appraisal has been provided as part of this report.

2. Introduction

2.1 Brief

- 2.1.1 Spillways Ltd have been appointed to prepare a SuDS maintenance report in support of the proposed development at 123 Broadhurst Gardens in London.
- 2.1.2 The aim of this report is to provide an insight into the maintenance regime for the Sustainable Drainage (SuDS) devices proposed for this project during post-development and operational phases of the development.
- 2.1.3 A detailed drainage strategy has been prepared for which this SuDS maintenance report has been based upon. Refer to drawing [1149-SPW-Z0-ZZ-M2-C-6000 - Below Ground Drainage – P2].

2.2 Report Structure

- 2.2.1 This report has been written to provide the reader with an understanding of the maintenance process. Section 3.0 starts off with a background into drainage and design philosophy. The adoption of sewers and SuDS are then explained in Section 4.0. An insight into the maintenance aspect of SuDS is explained in Section 5.0. Section 6.0 lists the proposed SuDS devices used on the project with explanations of SuDS specific anticipated maintenance. Section 7.0 moves onto provide an outline explanation the maintenance acquisition process and Section 8.0 concludes the report with recommendations.

2.3 Limitations

- 2.3.1 This report has been prepared for assisting the client in understanding the anticipated maintenance regime associated with the site. Spillways Ltd accepts no liability for any use of this document other than by its client and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of Spillways Ltd. Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole
- 2.3.2 Spillways Ltd has endeavoured to assess all information provided to them during this appraisal. The report summarises information from several external sources and cannot offer any guarantees or warranties for the completeness or accuracy of information relied upon.
- 2.3.3 The report is based on the drainage design and therefore considers the SuDS devices selected at this stage of the design. This report has been undertaken with the assumption that the site will be developed in accordance with the proposals without significant change. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.
- 2.3.4 No cost has been included within this report. Should estimate costs be required, it is recommended that a quantity surveyor or similarly experienced party to review the contents of this document and price against the proposed drainage strategy.

This will provide an indicative figure only and should be used for the purposes of estimates only until the final installation is complete and reviewed by a maintenance engineering company.

3. Background to Drainage

- 3.1.1** The surface water run-off generated at this site has been restricted to 1.6 l/s in accordance with the London Plan.
- 3.1.2** The public sewer system will benefit from this proposal as the flow control device will continue to restrict at a rate of 1.6 l/s for all storm periods up to the 100 Year + 30% climate change event. The rate of surface water entering the property for the higher duration storm events will be relieved from the public sewer.
- 3.1.3** Belowground level SuDS devices (geocellular devices):
- Designed to attenuate the 1:100 year + Climate Change flood event without flooding.
- 3.1.4** Control of the development plot discharge rates is maintained through the specification and installation of a pump device or similar flow controls.
- 3.1.5** Ideally, SuDS devices are encouraged to fill to its maximum level before surcharging and flowing on downstream to the next device. This ensures that SuDS are effectively utilised on site.

4. Adoption

- 4.1.1** Legislation covering the adoption of sewers, which includes pumping stations and other accessories, is contained within the Water Industry Act 1991 (the Act). Section 104 of the Act covers the adoption of private sewers to be constructed at a future date subject to an agreement with the sewerage undertaker. Once adopted they become public sewers and will be maintained by the Statutory Undertaker (In this instance Thames Water) at their expense. Upon approval, SuDS may become the responsibility of the Statutory Undertaker or similar body with high level responsibility for the management of water management.
- 4.1.2** Post completion of the project, it will be very likely that the onsite drainage will remain responsibility of the client/developer for lifetime of the development however the outfall sewers may be maintained by the client for 12 months after the provisional certificate has been granted.
- 4.1.3** SuDS will also remain the responsibility of the client/developer for the lifetime of the development.
- 4.1.4** Section 5.0 and 6.0 explores the maintenance of SuDS devices.

5. Maintenance of SuDS

- 5.1.1 Like all drainage systems, SuDS components should be regularly inspected and maintained. This ensures that the SuDS device remains efficient throughout its design life and prevents undesired failure.
- 5.1.2 The maintenance of the SuDS devices is generally no more complex than the maintenance of piped systems. For below ground SuDS, such as modular geo-cellular storage, more intensive and long-term actions are usually incorporated into a maintenance plan.
- 5.1.3 Section 6 describes the maintenance regime for the proposed SuDS within the Preliminary Storm Water Strategy.
- 5.1.4 The maintenance recommendations proposed in the following section are based on devices which have been handed over as fully operational. By this we refer to the cleaning of any construction silt and debris which may have accumulated within the network which may result in future blockages or failure.
- 5.1.5 It is recommended that underground networks are thoroughly checked using CCTV. Similarly, over ground devices and structures are to be visually inspected.

6. SuDS Devices

6.1 Cellular Storage for Attenuation

- 6.1.1 A below cellular storage tank structure is a robust technique of storing surface water compared to a conventional cellular storage.
- 6.1.2 Regular inspection and maintenance is required to ensure the effective long-term operation of below ground structure and its operation. Maintenance responsibility for systems should be placed with a responsible organisation.
- 6.1.3 The tank has been designed to be accessed however this should be carried out by a specialist with the necessary equipment and training to carry out inspection work safely.
- 6.1.4 The anticipated maintenance of the cellular storage tank structure can be found in Table 1 (below)

Frequency	Action	Type of Action
Monthly for the first three months	<ul style="list-style-type: none"> • Check standing water. • Check for cracks and signs of untoward settlement. 	Monitoring
Annually	<ul style="list-style-type: none"> • Remove sediment from tank by jetting. 	Maintenance
	<ul style="list-style-type: none"> • Inspect/check all inlets, outlets, vents and overflows to ensure good condition and correct operation. 	Maintenance
	<ul style="list-style-type: none"> • Inspect the level of standing water. 	Monitoring
After heavy rainfall event	<ul style="list-style-type: none"> • Inspect the level of standing water. 	Monitoring
REMEDIAL ACTIONS – AS AND WHEN REQUIRED		
<ul style="list-style-type: none"> • Remove sediment from tank. • Repair of inlets, outlet, overflows and vents. 		

Table 1 – Geocellular/Tank Maintenance

6.2 Hydrobrake

6.1.5 Hydrobrake devices will be required to convey the water towards the outfall sewer.

6.1.6 The location of the proposed Hydrobrake device has been shown in the drainage strategy drawing.

6.1.7 The anticipated maintenance of Hydrobrake can be found in Table 2 (below)

Frequency	Action	Type of Action
Routine Maintenance	<ul style="list-style-type: none"> Check the debris within chamber. Ensure water is draining away from within the chamber. Lift the bypass flap valve to ensure it operates as designed. Replace defective bypass valve as necessary. 	Maintenance
Annually	<ul style="list-style-type: none"> Check debris within chamber Check connection bolts and chamber Check for cracking or displaced incoming pipework. Check the condition of the hydrobrake structure Jet the chamber and hydrobrake internals (using low pressure jetting – Refer to Hydro-International recommendations) 	Inspection

Table 2 - Hydrobrake Maintenance

6.3 Pumps

6.1.8 Pump devices will be required to convey the water from the basement to the ground floor.

6.1.9 The locations of proposed pumps have been shown in the drainage strategy drawing. These installations are specialist/contractor designs.

6.1.10 The anticipated maintenance of pumps can be found in Table 3 (below)

Frequency	Action	Type of Action
Routine Maintenance	<ul style="list-style-type: none"> Lubricate the bearings. Inspect the seal. 	Maintenance
Routine Inspection	<ul style="list-style-type: none"> Check the level and condition of the oil through the sight glass on the bearing frame. Check for unusual noise, vibration, and bearing temperatures. Check the pump and piping for leaks. Analyse the vibration. Inspect the discharge pressure. Inspect the temperature. Check the seal chamber and stuffing box for leaks. Ensure that there are no leaks from the mechanical seal. Adjust or replace the packing in the stuffing box if you notice excessive leaking. 	Inspection
Quarterly Inspections	<ul style="list-style-type: none"> Check that the foundation and the hold-down bolts are tight. Check the packing if the pump has been left idle and replace as required. Change the oil every three months (2000 operating hours) at minimum. Change the oil more often if there are adverse atmospheric or other conditions that might contaminate or break down the oil. Check the shaft alignment and realign as required. 	Inspection
Annually	<ul style="list-style-type: none"> Check the pump capacity. Check the pump pressure. Check the pump power. 	Inspection

Table 3 - Pump Maintenance

6.4 Silt Trap and Catchpits

6.1.11 Catchpits and silt traps are online/offline localised depressions along the drainage to allow the settlement of debris and silt. These devices ensure the risk of blockage and impact on the performance of the drainage system is reduced.

6.1.12 Silt traps will be found on collector units such as gullies and channels.

6.1.13 Catchpits will be found incorporated as part of the access chambers.

6.1.14 Maintenance of silt traps is carried out by lifting the access covers to gullies and channels and any silt/debris is removed manually (by hand). The silt traps are often shallow units. Catchpits would be accessed by lifting the access cover of the chamber and debris would need to be removed using mechanical suction as the catchpit can be deep.

6.1.15 The anticipated maintenance of catchpits and silt traps can be found in Table 4 (below)

Frequency	Action	Type of Action
Quarterly Inspections	<ul style="list-style-type: none"> Lift access covers and remove any debris & silt Check access covers Check silt buckets and catchpits Carry out any jetting required to remove leaves and other bound silt. 	Inspect Maintain
Autumn Season Twice Monthly	<ul style="list-style-type: none"> Lift access covers and remove any debris & silt Check access covers Check silt buckets and catchpits Carry out any jetting required to remove leaves and other bound silt. 	Inspect Maintain
<ul style="list-style-type: none"> Any pipework with debris post completion of the project should be jetting out and cleansed prior to handover. 		

Table 4 – Silt Trap / Catch pit

7. Mechanism for Contract to Maintain

7.1.1 CIRIA Publication C625 'Model Agreements for Sustainable Water Management Systems. Model agreements for SuDS' was published in 2004.

7.1.2 As stated in Section 4, It is anticipated that the first year of responsibility for the maintenance of the drainage and SuDS network may be down to the client/developer.

7.1.3 During this time frame, it is advisory to carry out the short-term monitoring and maintenance as per the guidance set out in this document.

7.1.4 It is recommended that monitoring and maintenance be initialised immediately via a maintenance regime. A detailed regime should be undertaken post completion of the network design once all design criteria have been obtained and construction details have been prepared. It is anticipated that all construction and site drawings will be shared post completion handover.

7.1.5 The handover documents can be used to prepare a maintenance regime for the SuDS devices and this can be carried out by a specialist maintenance management organisation.

7.1.6 All maintenance documents should be held on site and copies offsite with a maintenance engineering company.

7.1.7 It is recommended that three competitive quotations are obtained for the cost of maintenance.

8. Conclusion and Recommendations

- 8.1.1** Spillways Ltd have been appointed to prepare a SuDS Maintenance Report in support of the proposed redevelopment of 123 Broadhurst Gardens in London.
- 8.1.2** The SuDS maintenance report is based on the most recent Surface Water Management Plan and aims to identify the maintenance measures associated with the proposed SuDS devices.
- 8.1.3** It is anticipated responsibility for the maintenance of the drainage and SuDS network may be down to the client/developer for the lifetime of the building.
- 8.1.4** The extent of maintenance and monitoring will vary between the current design stages and the final construction stages and therefore will require re-assessment at a later stage. Due to this degree of variance between design and construction, the costs associated with maintenance are unknown.
- 8.1.5** Should a budget cost be required for the maintenance of SUDS, a suitably experienced surveyor and/or maintenance specialist is recommended to be appointed to price for any maintenance works using this document and the drainage strategy drawing.
- 8.1.6** It is advised that any costs based on this report and the surface water management plan will be indicative only and will be subject to alteration during detail design phase.
- 8.1.7** The drainage strategy is heavily reliant on hydrobrake devices to help achieve the betterment in surface water run-off rates. The client should ensure that the maintenance of the drainage system is a key item in the operational of this building. All drainage installed internally have been designed by others and should also be maintained using the items set out in this report.
- 8.1.8** If the building is unoccupied; a management firm should be employed to oversee the routine maintenance of the drainage network.
- 8.1.9** The pumps should be fitted with a backup power supply and an alarm system which notifies of any failure in the system.
- 8.1.10** Any parts, products, materials and devices used by the contractor should be inserted into the maintenance handbook and the recommended manufactures maintenance should also be adhered to. The manufacturer's recommendations should supersede the information in this report.
- 8.1.11** All maintenance should be recorded to an adequate standard. As a minimum this should include the time and date with a detailed description of what inspection/maintenance was carried out.
- 8.1.12** Should the drainage network be installed and laid as designed; by carrying out the maintenance; it is considered that the drainage system will serve the building for its intended design life.

- 8.1.13** Manufactures and specialist contractors are asked to provide a comprehensive maintenance schedule for all items. The maintenance schedules should form part of the operational manual for the building.