MORGAN

ENGINEERING CONSULTANTS

Sustainable Drainage Systems Maintenance Plan

for

Sparlings Farm, Chelmsford Road, Barnston, CM16 1LP

2401-08

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1 INTRODUCTION

1.1 Introduction

1.1.1 This statement details the drainage maintenance requirements for the proposed surface and foul water systems at the development above. A copy of this statement should be provided to the party responsible for maintaining the drainage system and should also be included within the Maintenance Manuals for the development.

1.1.2 The maintenance detailed in this document must be undertaken throughout the lifetime of the development. Failure to undertake this maintenance may result in the drainage system not operating as designed, increasing the risk of flooding.

1.1.3 The drawing detailing the design of the drainage system are referenced 2401-08-C-01, 02 and 03

1.2 Terms of Reference

1.2.1 Sustainable Drainage Systems (SuDS) are a sequence of water management practices and facilities designed to drain surface water in a manner that will provide a more sustainable approach than what has been the conventional practice. SuDS are designed to mimic natural drainage flows and typically manage rainfall close to where it falls. Benefits include the effective management of runoff from hard standing surfaces, such as pavements and driveways, by reducing the volume, frequency and flow rate of surface water runoff during extreme storm events. They provide protection and/or enhancement of water quality (reducing pollution from runoff), are sympathetic to the environment and the needs of the local community and provide an attractive habitat for wildlife in urban locations.

1.2.2 The purpose of this management plan is to demonstrate how SuDS, which have been implemented at this particular residential development, will be maintained in compliance with various requirements and best practice guidance, including but not limited to, the National Planning Policy Framework (NPPF) and SuDS Manual (CIRIA, 2015).

1.2.3 The maintenance plan aims to:

- Summarise the surface and foul drainage strategy
- Summarise the various SuDS features used within the site;
- Establish who is responsible for the maintenance of the drainage including the SuDS components;
- Set out how to maintain the incorporated components following construction;
- Ensure that all those involved in the maintenance and operation of the SuDS understand their functionality and maintenance requirements in terms of supporting long-term performance.

Maintenance inspections should be recorded in Appendix 1.0 of this report to ensure that the document stays up to date.

2 DRAINAGE STRATEGY

2.1 Surface Water Drainage Strategy

2.1.1 The below ground surface water drainage system comprises of a combination of (non infiltrating) permeable surfaces and traditional piped system, drained by gravity to a geo-cellular storage, sized to accommodate all storms up to and including the peak 100 YR event with a 40% allowance for climate change. The final surface discharge is controlled by a private package pump station limiting flows to a maximum 1.0 l/s for all storm events, discharging to an existing ditch located on site.

2.2 Foul Water Drainage Strategy

2.2.1 The below ground foul water drainage system comprises of a traditional piped system, drained by gravity to a new private package pump station discharging to an existing foul drain located on site. The indirect connection to the public sewer will be subject to Section 106 Approval

3 MAINTENANCE REQUIREMENTS

3.1 General

3.1.1 Only trained personnel will be permitted to undertake maintenance of SuDS features and drainage where responsibility lies with Private Management Companies. This work must be carried out in accordance with the Confined Space Regulations. To facilitate this maintenance, manholes, inspection chambers and other apparatus are located, where they are reasonably accessible.

3.2 Maintenance Responsibility

3.2.1 The drainage system components within the public highway will be maintained by Thames Water, this includes the manholes and lateral connections.

3.2.2 All drainage within the site boundary will be the responsibility of the private management company.

3.2.3 The details for the private management company are to be confirmed.

3.3 General Maintenance Requirements

3.3.1 Whilst the drainage system has been designed to operate with as little maintenance as possible, there are key operations that must regularly be undertaken to ensure that it remains in optimal condition, most of which are general housekeeping tasks that should be undertaken for any drainage system, but with additional attention to the catchpits upstream of the flow control devices and underground storage apparatus. These operations are summarised below together with recommended frequencies:

3.3.2 Periodic desilting of catchpits, gully sumps and channel drains. These should be emptied at least as follows (but with an annual inspection and additional cleansing if required): On completion of drainage works, Year 1, Year 3, then every 5 years. The desilting of these items are required to underground storage tanks and flow control device operate as per the design, and do not become blocked.

3.3.3 Periodic jetting or rodding of pipework as required to clear blockages.

3.3.4 Gratings on any gullies and channel drains to be kept clear of debris.

3.3.5 The drainage components beneath external areas (under landscaping, hard surfacing and car parking) will be easily accessible for maintenance purposes.

3.3.6 Ease of access for maintenance and inspection is essential; the manhole lids will be kept as lightweight as practicable. Frequent street sweeping in the catchment areas of flow control device and catchpits will increase the time interval in which the system has to be cleaned out.

3.3.7 The proposed catchpits are essentially sump manholes where the outlet pipe is set at a level above the inlet pipe, allowing some removal of sediments, floating debris, oil and grease from surface water. The sump in the catchpits will be cleaned out using a conventional sump vacuum cleaner. In most situations, the units should be cleaned out at least annually.

3.3.8 The following maintenance regime would be recommended as a minimum, but actions and frequencies should be adjusted to suit the specific requirements of this development. However, the previous discussed, component specific regimes and any manufacturer's specific recommendations should always be followed.

Maintenance Schedule	Required Works/Action	Frequency
Routine Maintenance	Inspect and identify incorrect operation.	Monthly
	Debris removal from catchment area using sweeping and vacuuming.	3 Monthly
	Removal of sediment from pre-treatment components i.e catchpits.	Annually

Table 3.1 - Recommended Maintenance Requirements

3.4 Pipe Networks

3.4.1 All pipe work will be visually inspected at least once a month for the first three months after installation and then a minimum of once year.

3.4.2 Flushing of the system can be achieved using a jetting system with a 150 bar pump pressure (ie. approximately 80 bar at the nozzle) at a discharge flow of 300 l/min. The jet nozzle should be introduced to the system via the Inspection manhole and the integral inspection / maintenance tunnel.

Any silt & debris should be flushed to the inspection or catchpit manhole and removed in accordance with the Management Company policy for waste management.

Below Ground Pipe Network Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Remove sediment from pre-treatment inlet structures and inspection chambers.	Annually or as required
	Maintain vegetation to designed limits within the vicinity of below ground drainage pipes and tanks to avoid damage to system.	Annually, or as required
Remedial actions	Repair physical damage if necessary	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually and after large storms

3.5 Geocellular Systems

3.5.1 Regular inspection of geo-cellular systems is required to ensure effective long-term performance of the system. Maintenance needs of the system should be monitored, and schedules adjusted to suit the specific requirements of the development.

3.5.2 The following maintenance regime would be recommended as a minimum, but actions and frequencies should be adjusted to suit the specific requirements of this development. However, manufacturer's specific recommendations should always be followed.

Maintenance Schedule	Required Works/Action	Frequency
Regular Maintenance	Inspect and identify incorrect operation.	Monthly
	Debris removal from catchment area using sweeping and vacuuming.	3 Monthly
	Removal of sediment from pre-treatment components i.e catchpits.	Annually

Table 3.2 – Recommended Maintenance Requirements

3.5.3 Current best practise suggests that underground geo-cellular storage systems are constructed with access 'turrets' to ease future maintenance. These 'turrets' allow the annual removal of any silts or sediments directly from the tank ensuring effective long-term performance.

3.6 Permeable Pavements

3.6.1 The areas of permeable pavement will require additional maintenance measures to ensure they operate as designed. Failure to carry out this maintenance, could increase the risk of flooding. The areas of permeable pavement are designed to allow movement of surface water run-off through the joints in the block paving and into the sub base below. The water is then collected and discharged to the positive drainage system.

3.6.2 Periodic surface sweeping to reduce silt and debris accumulation. The permeable surfaces should be swept at least every 8 to 12 weeks with additional sweeps in the autumn to clear fallen leaves.

3.6.3 Periodic silt removal from Permeable surfaces as described by manufacturer. If any areas are showing signs of ponding, they shall be dealt with by raking out the joints and redressing. The entire surface shall be monitored and when there are signs of excessive siltation resulting in poor drainage over the whole area, the blocks shall be taken up and a replacement of bedding layer and geotextile shall be undertaken.

Permeable Pavements Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site specific observation of clagging or manufacturers recommendations – pay attention to areas where water runs onto permeable surface from adjacent impermeable areas as this area is most likely to collect the most sediment.

Permeable Pavements Continued

Permeable Pavements Maintenance schedule	Required action	Typical frequency
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As Required
	Rehabilitation of surface and substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulations rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

3.7 Flow Control Devices

3.7.1 The flow control devise provides customised water quantity management for surface, foul, or combined water across a wide range of flows and for a variety of applications. The flow controls have no moving parts and no power requirements and provides reliable, low-maintenance, engineered flood management as part of green infrastructure developments.

3.7.2 Periodic desilting of the sumps as well as checking the emergency drain down mechanism is in good working order. The sump should be emptied/checked at least as follows (but with an annual inspection and additional cleansing if required): On completion of drainage works, Year 1, Year 3, then every 5 years.

3.7.3 Any specific manufacturers guidance should take precedence over the contents of this maintenance plan.

3.8 Package Pump Station

3.8.1 Specific manufacturers guidance should take precedence over the contents of this maintenance plan.

3.9 Accidental Spillages

3.9.1 It is not envisaged that any materials are to be stored onsite once the development is completed, which could cause major spills and potential pollution issues within the drainage system. If this situation alters in the future a specialist will be required to be contacted to confirm if any upgrades to the existing system are required.

3.9.2 Minor spillages of fuels and oils from motor vehicles will be dealt with by the permeable paving and deep trapped gullies, by biodegrading / collecting the hydrocarbons respectively.

4 CONTACT DETAILS AND RECORD OF MAINTENANCE

4.1 Contact Details of Individual/Individuals Responsible for This Plan

4.1.1 In the event of concern over any matter related to drainage, please contact:

Name:…….**MATT HAMMOND** ……Address:……..
……. **THE STABLES, TOOLEYS FARM, BROOK END,** ……
……. **STEBBING, ESSEX, CM6 3AA** ……
……Phone:**07793770930** ……..
……..Email:..**matthew@byfordandhammond.co.uk** ……

4.2 Record of Maintenance and Photographic Evidence

4.2.1 Please provide a record of all inspections (including all photographic evidence) in Appendix 1.0.

Appendix 1.0

Record of maintenance