Waldeck
Digital Strategy Consultancy Solutions

Drainage Statement Report & SuDS Maintenance Plan for:

Rick Smith Design

Project:

8 Units – Residential Development at Great Hale

Version	03
Date of Issue	10/11/2020
Document No.	180419-WDK-00-SI-RP-D-33000
Status	Information
Technical Reviewer	BJ
Author	SY

Details of Document Control

Revision	Author Initials	Checked By: (Signature)	Approved By: (Signature)	Date Of Issue	Reason For Change
01	SY	BJ	SY	22/05/2019	First Issue
02	JBB	SY	PGW	28/11/2019	Updated drainage details
03	JW	PGW	PGW	10/11/2020	Updated to suit revised gravity foul connection

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Introduction

This document sets out the principles for the drainage strategy and the long term management and maintenance of the surface water Sustainable Drainage Systems (SuDS and related drainage features) to be constructed at the development to the south west of Great Hale, Sleaford, NG34 9JA.

The purpose of this document is to address condition number 8 of the planning application referenced 18/0708/OUT, which relates to drainage requirements and management of drainage features throughout the site.

The document sets out the basis of the drainage design with reference to each of the items within condition 8, and sets out the developments' SuDS Maintenance Plan to ensure that the adopting body is entrusted with a robust inspection and maintenance programme, ensuring the optimum operation of the surface water drainage network is continually maintained for the lifetime of the development and to prevent the increased risk of flooding both on and off site in accordance with the National Planning Policy Framework (NPPF).

The activities listed in this document are generic to the relative SuDS types and represent the minimum maintenance and inspection requirements taken from the Anglian Water Sustainable Drainage Systems (SuDS) Adoption Manual. However, additional tasks or varied maintenance frequency may be instructed by the maintenance company as required. Specific maintenance needs of the SuDS elements should be monitored and maintenance schedules adjusted to suit requirements.

All those responsible for maintenance of drainage features should follow relevant Health and Safety legislation (Health and Safety at Work Regulations, 1999) for all activities listed within this report including lone working, if relevant, and risk assessments should always be undertaken.

Any contractor employed by the adopting body shall carry out periodic maintenance of all such SuDS in accordance with the schedules listed in this report. Inspection checks shall be carried out by a qualified and competent person, at the minimum intervals listed within the schedules and the appropriate work carried out.

1. Drainage Proposals

1.1. Surface Water Drainage

The planning permission has approved a discharge rate of 9.16l/s. Having modelled the drainage it is apparent that a restricted run-off of 9.16l/s will require additional attenuation to ensure that water is stored during rainfall events up-to and including the 1 in 100 year + 40% climate change events. The surface water will discharge south, before it finally discharges into 'The Brook', which is a substantial watercourse. Initial enquiries have taken place with Black Sluice Internal Drainage Board, and although the proposed discharge rate exceeds the rate above which fees are required, they are happy with the proposed run-off, subject to the developer paying the required contribution.

The site has been designed with a SuDS consideration in mind; the carriageway is laid to a single crossfall which discharges into a filter strip before entering a piped filter drain. The private water is drained into catchpits located within the filter drain. As the filter drain is collecting water from both the carriageway and houses, it is expected that Anglian Water will adopt this feature. It is proposed that the filter drain will be wrapped in impermeable membrane, so that the conveyed water has no impact on the road sub-base or the house foundations.

Attenuation is provided within both the filter drain and also the geo-cellular storage crates to ensure that all water up to the 1 in 100 year + 40% climate change event is stored below ground. It is proposed that Anglian Water will adopt the filter drain (Lincolnshire County Council Highways are proposed to adopt the above ground swale).

The geo-cellular attenuation crates will be maintained by a private maintenance company.

In the event of device failure, the exceedance flows have been shown on Waldeck Drawing 180419-WDK-00-SI-DR-C-33002. The proposed development has a cross fall where exceedance flows will flow into the swale and filter drain which will then discharge to The Brook as intended. In the event of a complete surface water drainage system failure, the site has a general fall towards The Brook for any exceedance flows.

The details for the surface water drainage proposals can be found on Waldeck drawing 180419-WDK-00-SI-DR-C-33000 in Appendix A., and the surface water calculations can be found in Appendix B.

1.2. Foul Water Drainage

The client has identified existing Anglian Water manhole ref 0702 located in Orchard Close to the west of the proposed development as having differing cover and invert levels to that supplied on Anglian Water asset maps. With client supplied levels it is possible to enable a gravity connection for the proposed developments foul drainage system.

This foul sewer system will be constructed to adoptable standards and offered to Anglian Water for adoption under a Section 104 Agreement. The details for the foul water drainage proposals can be found on Waldeck drawing 180419-WDK-00-SI-DR-C-33000.

2. SuDS Layout & Design

The storm water drainage strategy for the proposed development utilises SuDS features to intercept and convey surface water runoff. The design of the system aims to attenuate runoff and ensure downstream and on site flood risk is not increased as a result of the development.

The proposed storm water system consists of the following SuDS or related components:

Filter Strips/ Drains;

Pipework;

Catch Pits;

Geocellular Crates.

Hydrobrake; and

Headwall.

There are three categories of maintenance activities referred to in this report:

Regular maintenance (including inspections and monitoring).

Consists of basic tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.

Occasional maintenance

Comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example).

Remedial maintenance

Comprises intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design.

Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.

3. SuDS Management & Maintenance

The drainage system including the filter strips/drains, pipework, catch pits, geocellular crates, hydrobrake and associated outlet headwall will be subject to a routine monitoring and maintenance schedule as part of the general site management. This will be carried out at monthly intervals between 1 April and 31 October and once between 1 November and 31 March unless otherwise detailed. A record of maintenance visits and remedial operations shall be maintained. The following guidelines are offered as an initial regime, but may be either increased or decreased by the adopting body depending on the local environment and any external contributing factors.

The key maintenance requirement for the filter strips/drains, pipework, catch pits, geocellular crates, hydrobrake and associated outlet headwall will be the maintenance of vegetation and mowing of grass within and on the verges/banks and the removal of accumulated sediments and collection of litter and debris.

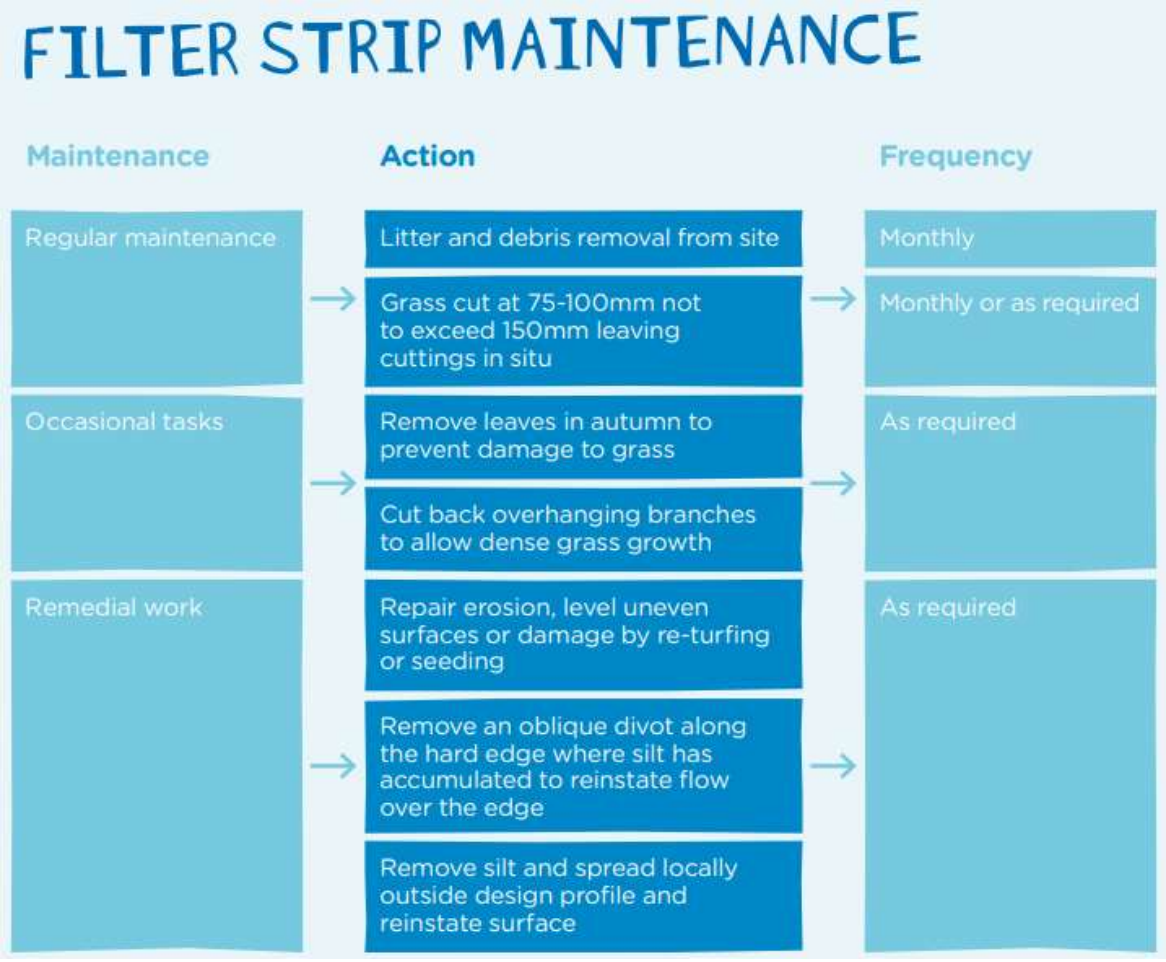
During the inspections the general operation, and structural condition of the outlet headwall and any scour/ erosion of filter drains/ banks should be identified and rehabilitated as required.

Note: The operations contained within this section specific to the maintenance of landscaping, shall be read in conjunction with any development landscape maintenance plan(s).

3.1. Filter Strips

Key Design Standards;

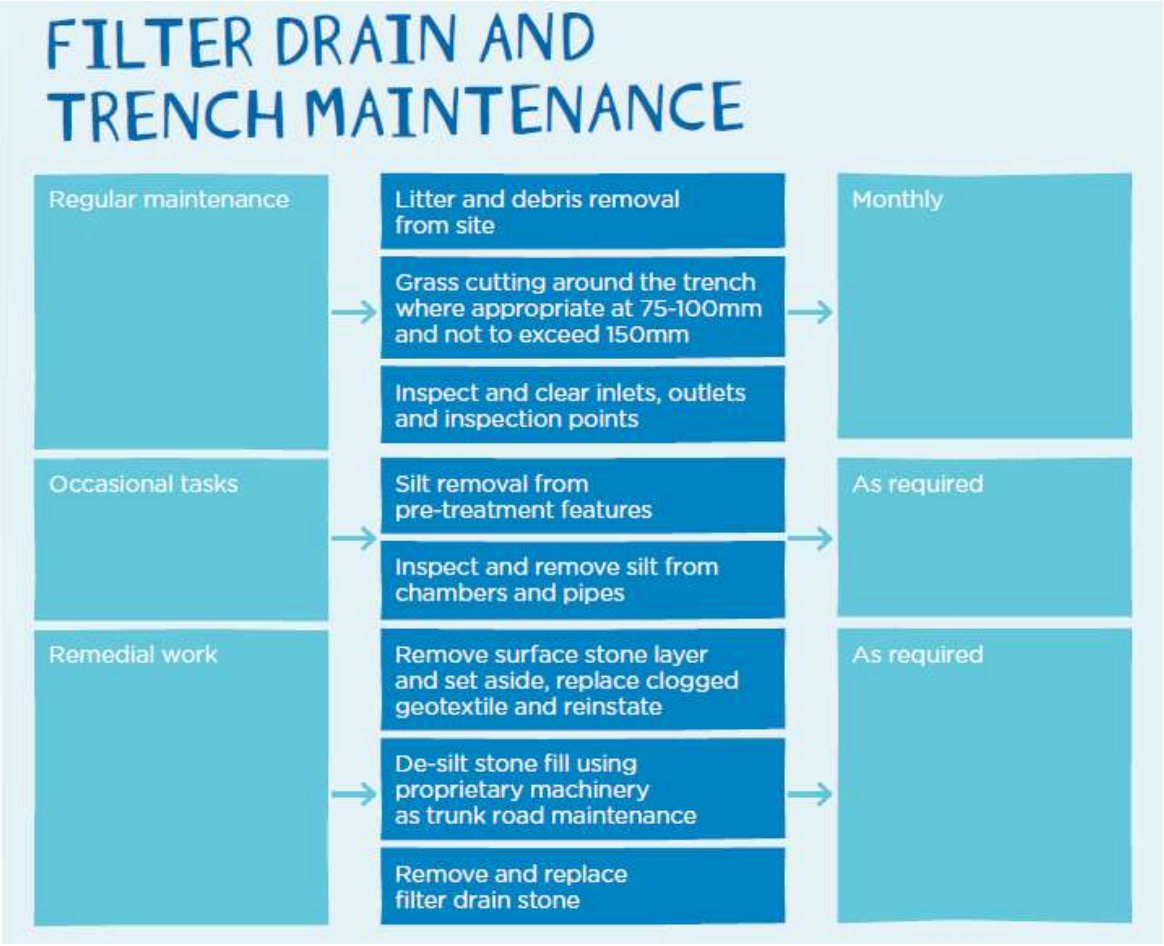
- Surface water runoff must flow across a flush kerb edge onto a grass or a vegetated surface.
- The hard edge must be generally level to ensure an even flow and prevent erosion and gullying.
- The filter strip should be 20-25mm below the edge of the kerb to allow an unobstructed flow onto the vegetated surface and avoid ponding.
- The slope of the filter strip increases to ensure adequate flow e.g. 1 in 40 road cross fall to 1 in 20 filter strip for a minimum of 1m.
- A minimum width of 900-1200mm.
- Over-run by vehicles must be prevented by bollards, rails, fences or other controls to retain even surface flow.
- The kerb haunch must allow a minimum of 100mm topsoil for acceptable grass growth with generally 150mm topsoil over subsoil.
- A minimum of 1 in 50 and maximum of 1 in 20 slope is recommended.



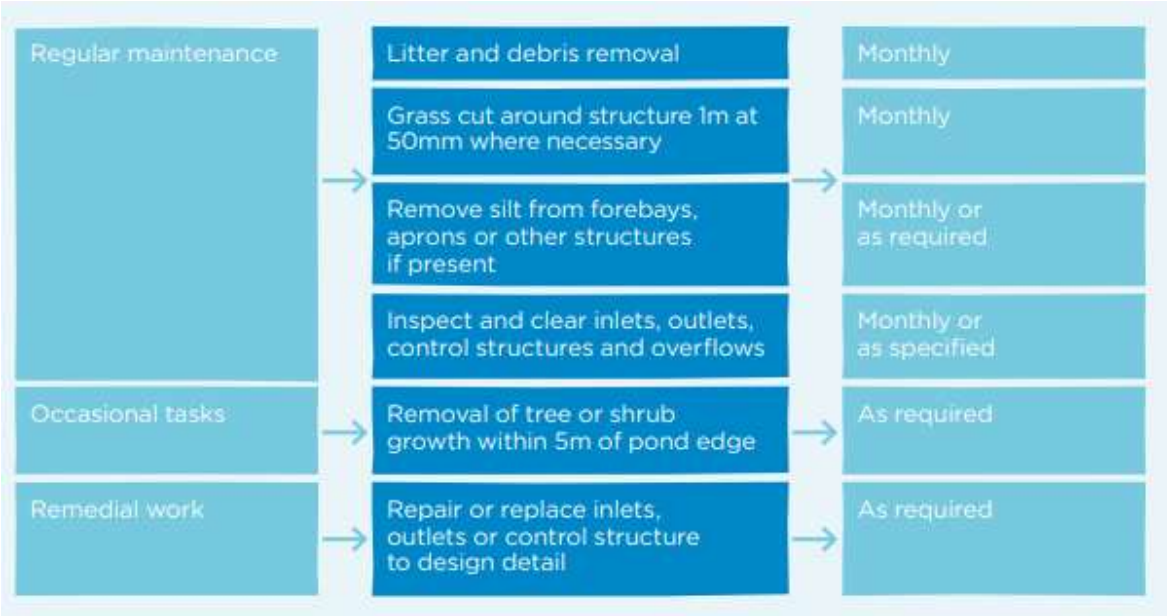
3.2. Filter Drains

Key Design Standards:

- Measures are required to protect or manage siltation.
- A perforated pipe may be appropriate to convey water onward from the drain and should include access for rodding or jetting with open outfalls.
- Where infiltration is proposed then a high level overflow pipe may be appropriate.
- Perforated pipes should normally be provided for the last few metres of the trench to maximise filtration.
- The edge of the drain should be level to encourage sheet flow and prevent gully erosion where taking a lateral flow.
- Point source inlets should incorporate a silt pre-treatment feature to prevent clogging of the inlets or surface layers.



3.3. Catchpits, Hydrobrake and Headwall



3.4. Geocellular Crates

Key Design Standards, there are two basic modular box arrangements;

- A modular box system with inlet and outlet pipework connected to the sides of the structure.
- A honeycomb structure with perforated pipes running under or through the box. Water is forced into the box when flows increase. There are now shallow, load bearing boxes which can be used under pavements and in particular below permeable pavement which protects the box from silt contamination and provides treatment with enhanced storage.

4. Appendices

Appendix A – Drawings

Appendix B – Micro drainage calculations