SuDs Management Plan

21T2034 – Cleator Moor Innovation Quarter – Area 3

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SuDs Management Plan

Project: Cleator Moor Innovation Quarter – Area 3

Client: Copeland Borough Council

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Contents

1. Introduction

1.1 Billinghurst George and Partners has been commissioned by Copeland Borough Council to prepare a SuDS Management Plan regarding the light industrial, general industrial and storage and distribution units on the greenfield site at land off Bowthorn Road, Cumbria.

1.2 This SuDS Management Plan has been produced to demonstrate how the proposed use of Pipes and an Attenuation Tank will be managed and maintained to satisfy the requirements set out in CIRIA 753 and in accordance with the Cumbria Development Design Guide which is Cumbria County Council (CCC) criteria for Sustainable Drainage Systems (SuDS).

1.3 This report is provided to assist the adopting body/maintaining body in developing an appropriate Maintenance Plan.

1.4 The format of the manual will be agreed in advance with the principal designer and end user, and the manual will include relevant information from all designers, suppliers and subcontractors for every element of the project.

1.5 This manuals will be reviewed by the principal designer, and handed over to the client on practical completion. Demonstration and Training will also be arranged for the building users and maintenance staff where required.

1.6 The operation and maintenance manuals will include the SUDS management plans, as well as any other information required for the operation and maintenance of the site drainage system.

2. Site Description

2.1 At approximately 13.3 Ha in size the Greenfield site is located approximately 5.15km southeast of Whitehaven and approximately 18km southwest of Cockermouth. The site is currently an overgrown greenfield. The site is bound by fields to the north and eastern boundary, residential development to the south and Nor Beck to the west.

2.2 The site is split into two areas by Nor Beck, one to the south east of Nor Beck and one to the northwest of Nor Beck.

2.3 The Site B area southeast of Nor Beck varies in level throughout. The level to the eastern boundary is approximately 87.0m AOD, this falls to the north-western extent adjacent Nor Beck at a level of 79.0m AOD. This equates to a gradient of approximately 1 in 25. The level from northern to southern extent is relatively level.

2.4 The Site B area northwest of Nor Beck varies in level throughout, with a gradual mound located towards the eastern extent adjacent Nor Beck. The highest point of this mound is 84.0m AOD, this falls southeast toward Nor Beck at a level of 76.0m AOD. This equates to a gradient of 1 in 19. The northern boundary adjacent Bowthorn Road varies significantly, falling from east to west from 85.0m AOD to 76.0m AOD. This equates to a gradient of 1 in 31. A large expanse of Site B is relatively level at 76.0m AOD to the western boundary adjacent Nor Beck and Bowthorn Beck, this is largely comprised of a Flood Zone 3.

2.5 The nearest named watercourse is Nor Beck, which is located to the sites southwestern boundary running from east to west through the site then along the southwestern boundary where it converges with Bowthorn Beck and is culverted. From the point it converges it is culverted and drains west then south ultimately converging with the River Keekle.

2.6 A further watercourse is located to the northwestern boundary, Bowthorn Beck. This drains north into site and west where it converges with Nor Beck.

2.7 There are no other named or unnamed watercourses within close proximity to site.

3. Existing Drainage Regime

3.1 The equalivant greenfield run off rates from the existing site have been calculated using UKSuds.com. This calculation follows the IH124 method for calculation of greenfield runoff.

3.2 The greenfield runoff rate is calculated as 129.6 l/s, based on a greenfield area of 13.3 ha.

3.3 A series of United Utilities combined drains and manholes are located throughout the site adjacent Nor Beck. Two combined sewers enter through the western boundary and one through the eastern boundary, they converge adjacent Nor Beck watercourse toward the centre of site. From the point the sewers converge the 600mm diameter United Utilities combined sewer flows west adjacent Nor Beck and offsite through the existing residential development beyond site.

3.4 The site is not currently served by wastewater systems.

4. Proposed Surface Water Drainage Solution

4.1 The development site is split into two areas by Nor Beck.

4.2 The northwest development proposes to discharge surface water flows to the Nor Beck watercourse adjacent the sites western boundary. Surface water flows are to be restricted to a greenfield run off rate of 100.0 l/s, this rate is to be agreed with the Lead Local Flood Authority and Environment Agency.

4.3 The southeast development proposes to discharge surface water flows to the Nor Beck open watercourse within site. Surface water flows are to be restricted to a greenfield run off rate of 29.60 l/s, this rate is to be agreed with the Lead Local Flood Authority and Environment Agency.

4.4 The final surface water connections for the two areas will be via gravity and headwall.

4.5 Due to the minimal amount of green open available space onsite it is deemed a suitable solution to provide the attenuation volume to retain the 1 in 100 year + 40% climate change flood event below ground within an attenuation tank.

4.6 The attenuation for the northwest area is to provide storage and a 5.0 l/s restricted discharge rate on a plot by plot basis, volumes of which are detailed within the Drainage Plan. The final discharge rate for the overall area is 100.0 l/s and attenuation provided to accommodate highway flows and the 5.0 l/s run off from each of the plots.

4.7 The attenuation for the southeast area is to provide storage and a 5.0 l/s restricted discharge rate on a plot by plot basis, volumes of which are detailed within the Drainage Plan. The final discharge rate for the overall area is 29.6 l/s and attenuation provided to accommodate highway flows and the 5.0 l/s run off from each of the plots.

4.8 The tanks within plot boundaries are to be maintained by private management companies, maintenance requirements for the tank are detailed in chapter 7 of this report. Tanks are to be installed as per the manufacturer's drawings following detailed development of the design. The tank management is to be read in conjunction with the Landscapes maintenance documents.

4.9 Flow Control chambers are to be designed/installed to manufacturer's guidance and specification in accordance with relevant guidance and procedures. Flow Control chambers are to be managed and maintained by a private management company.

4.10 Any manufacturer's maintenance recommendations over and above what is stated on the maintenance tables will also be included in the maintenance plan.

5. SuDS Management and Maintenance

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

- Pipes
- Attenuation Tank

5.2 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.

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).

6. Pipes

6.1 Sewer Pipes form the basis of the drainage strategy, also for attenuation purposes, they will hold additional flows in the pipework and manhole chambers when flood exceedance occurs.

6.2 Table 1 regarding Pipes provides guidance on the type of operational and maintenance requirements that may be appropriate. The list of actions is not exhaustive and some actions may not always be required.

Table 1 - Operation and Maintenance requirements for Pipes

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
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Maintain vegetation to designed limits, within the vicinity of below ground drainage pipes and tanks to avoid damage to system	Annually or as required
	Remove sediment from pre-treatment structures and/or internal fore bays	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
	Survey inside of the pipe runs for sediment build up and remove if necessary	Every 5 years or as required

6.3 The pipes are installed at gradients which provide self-cleansing, therefore no significant maintenance is required.

6.4 Blockages should be removed if they occur.

6.5 Manholes/inspection chambers with silt traps should be inspected 6 monthly and emptied of any silt as required.

6.6 Back inlet gullies and rainwater pipes should be inspected 6 monthly and any blockages or silting up removed.

7. Attenuation Tank

7.1 The Attenuation Tanks are located on a plot by plot basis and maintained by the respective plot developer, see Drainage Plan for further information.

7.2 The primary function of the Attenuation is to provide storage through the site during times of severe flood events up to and including 100 year + 40% climate change event. Table 2 provides guidance on the type of operational and maintenance requirements that may be appropriate.

Table 2 - Operation and Maintenance requirements for Crates/Tanks

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
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Catch pits either side of tanks to be regularly inspected and cleared of any silt build up.	Annually
	Remove sediment from pre-treatment structures and/or internal fore bays via jetting or similar approved method.	Annually or as required
Remedial Actions	Repair/rehabilitate inlets, outlets, catch pit chambers and vents.	As Required
Monitoring	Inspect check/ all inlets, outlets, vents and catchpit to ensure that they are in good condition and operating as designed	Annually
	Survey inside of the tank from catchpit chamber for sediment build up and remove via jetting if necessary	Every 5 years or as required

7.3 Regular inspection and maintenance is required to ensure the effective long term operation of below ground storage systems. Maintenance responsibility for the system should be placed with a responsible organisation. Crates/Tanks above provides guidance on the type of operational and maintenance requirements that may be appropriate. The list of actions is not exhaustive and some actions are not always required.

7.4 Maintenance plans and schedules should be developed during the design phase, and will be specific to the type of tank that is adopted. Specific maintenance needs of the system should be monitored, and maintenance schedules adjusted to suit requirements. CDM 2015 requires designers to ensure that all maintenance risks have been identified, eliminated or reduced and/or controlled where appropriate. This information will be required as part of the health and safety file.