LAST & TRICKER PARTNERSHIP

SUDS MANAGEMENT & MAINTENANCE PLAN

FOR
66 DWELLINGS ON LAND NORTH WEST OF
HILL HOUSE LANE, NEEDHAM MARKET IP6 8RH

HHF (EA) LIMITED

Date: May 2021

Ref: 5094

1 Introduction

1.1 This document sets out the principles for the long term management and maintenance as well as the implementation of the proposed surface water Sustainable Drainage Systems (SuDS) to be installed at the residential development at land north west of Hill House Lane, Needham Market IP6 8RH.

1.2 The purpose of this document is to ensure that the adopting management company 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 ofthe development and to prevent the increased risk of flooding both on and off site.

1.3 This plan has been comprised of and is directly referenced from the latest technical SuDS guidance within the The SuDS Manual and other applicable guidance. Ciria report C753 (2015).

1.4 This document is laid out in specific sections applicable to the relevant SuDS type detailing:

- A description of the SUDS component and its use.
- Maintenance requirements and frequencies.
- Inspection requirements and frequencies.

1.5 The activities listed are generic to the relative SuDS types and represent the minimum maintenance and inspection requirements, 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.

1.6 All those responsible for maintenance should follow relevant health and safety legislation for all activities listed within this report (including lone working, if relevant) and risk assessmentsshould always be undertaken.

1.7 This report is to be read in conjunction with J P Chick and Partners drainage layout drawings for the location of all SuDS systems on this site.

1.8 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, includingvegetation management, litter and debris removal, and inspections.

- Occasional maintenance

Comprises tasks that are likely to be required periodically, but on a much less frequentand 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 thesystem, 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.

2 SuDS Layout & Design

2.1 The main SuDS components with the surface water drainage strategy are:

- Permeable paving;

  Pervious pavements provide a pavement suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate through the surface and into the underlying structural layers. The water is temporarily stored beneath the overlying surface before use, infiltration to the ground, or controlled discharge downstream.
  Pervious surfaces, together with their associated substructures, are an efficient means of managing surface water runoff close to its source intercepting runoff, reducing the volume and frequency of runoff, and providing a treatment medium. Treatment processes that occur within the surface structure, the subsurface matrix (including soil layers where infiltration is allowed) and the geotextile layers include:
  - Filtration
  - adsorption
  - biodegradation
  - sedimentation

- Soakaways – aquacell;
  There are many different types of drainage component that can be used to facilitate infiltration. These include soakaways, infiltration trenches, infiltration-blankets and infiltration basins. Bioretention systems and pervious pavement can also be designed to allow infiltration from their bases.

  Infiltration can contribute to reducing runoff rates and volumes while supporting base flow and groundwater recharge processes. The rate at which water can be infiltrated depends on the infiltration capacity (permeability) of the surrounding soils.

  Soakaways are excavations that are filled with avoid-forming material that allows the temporary storage of water before it soaks into the ground. Historically, small soakaways draining runoff from a single property were either filled with rubble or lined with brickwork and were sited below gardens and drives with no formal provision for access and inspection. Many small soakaways are now constructed with geoc-ellular units available from builders' merchants pre-wrapped in geotextile. The geocellular units provide good overall storage capacity compared to rubble fill, and they allow the size of the structure required for any application to be minimised.

  Larger soakaways may be constructed with perforated precast concrete manhole rings surrounded with granular backfill or using geo-cellular structures. Concrete manhole soakaway shave the advantage ofa ccess for inspection and maintenance (although any gravel surround cannot be inspected or easily maintained). When considering the use of geo-cellular systems,the long-term structural integrity, acceptance for adoption by the SuDS system asset owner/operator and the anticipated service life of the asset should be addressed.

- Detention basins;
  Detention basins are landscaped depressions that are normally dry except during and immediately following storm events. They can be on-line components where surface runoff from regular events is routed through the basin and when the flows rise, because the outlet is restricted, the basin fills and provides storage of runoff and flow attenuation. They can also be off-line components into which runoff is diverted once flows reach a specified threshold.

  Detention basins can be vegetated depressions (that can provide treatment when designed to manage regular flows) or hard landscaped storage areas (that will tend not to provide any treatment and are normally designed as off-line components).

  Where the basin is vegetated, the soil surface can absorb some runoff, so can be used to support the prevention of runoff from the site for small rainfall events (Interception), provided that small amounts of infiltration would not pose a risk to groundwater. The principal water quality benefits of vegetated detention basins are associated with the removal of sediment and buoyant materials, but levels of nutrients, heavy metals, toxic materials and oxygen-demanding materials may also be significantly reduced. The water quality benefits of a vegetated detention basin increase as the detention time for an event becomes longer. Where designed appropriately, some or all of the basin area can also be used as a recreational or other amenity facility.

  - Below ground storage – crates;
    Attenuation storage tanks are used to create a below-ground void space for the temporary storage of surface water before infiltration, controlled release or use. The storage structure is usually formed using one of the following methods:
  - Geo-cellular storage systems;
  - plastic corrugated arch structures (constructed over and backfilled with an open-graded aggregate base);
  - oversize concrete pipes;
  - oversize plastic pipes;
  - corrugated steel pipes;
  - precast or in situ concrete box culvert sections and tanks (including flat-packed concrete panels);
  - glass-reinforced plastic (GRP) tanks;
  - hybrid structures using reinforced earth walls and concrete roof panels;

  The inherent flexibility in size and shape (and in some cases modularity) of the above systems means that they can be tailored to suit the specific characteristics and requirements of any site. Their main benefits are:

  1. Their high storage volume (compared to structures filled with aggregates)
  2. Their potential for installation beneath roads and car parks (provided they are designed to with stand traffic loadings) and recreational areas and other public open space.

3 SUDS Management & Maintenance

TABLE 20.15 Operation and maintenance requirements for pervious 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 observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
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 upper 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 accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

TABLE 13.1 Operation and maintenance requirements for soakaways

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

TABLE 22.1 Operation and maintenance requirements for detention basins

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

TABLE 21.3 Operation and maintenance requirements for attenuation storage 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
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	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 tank for sediment build-up and remove if necessary	Every 5 years or as required

4 Management and Maintenance Responsibilities

SUDS Feature	Management/maintenance responsibility
Cellular crate tanks	Individual property owner/s
Drainage outfall from private drives	Management Company
Detention Basin	Management Company
Storage tank and pipework within road	Management company
Package pumping station	Management company
Orifice within carriageway tank	Management company
Hydrobrakes from storage crates	Management company

4.1 The minor access road and shared surface road will be offered for adoption and if so maintained by the highway authority.

4.2 There will be one Management Company that will maintain the shared infrastructure, comprising roads (raised tables, kerbs, footways, verges and margins) drainage (manholes,storage systems, pipes, flow controls) lining, lighting and signing, kerbs, unadopted public open space (including, play equipment, surfacing, fencing) and any other shared communalinfrastructure.

4.3 Implementation of the drainage system will be the responsibility of the developer who mustensure that all Regulations, Codes of Practice and British Standards are complied with.