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CHARTERED CONSULTING ENGINEERS

Our ref: 2489/01tn1

11<sup>th</sup> March 2026

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**DRAINAGE MAINTENANCE AND MANAGEMENT PLAN**  
FOR  
**DEVELOPMENT AT BRADLEY VILLA FARM**

Introduction

It is essential that drainage systems, including any Sustainable Drainage Systems (SuDS) and proprietary components, are subject to periodic inspection and maintenance over their lifetime, so that they continue to function to the intended design standard.

This document sets out the responsibilities for management and maintenance of the proposed drainage systems at the above site, and outlines a recommended maintenance regime to be implemented by the responsible party.

This report has been initially prepared for the use and reliance of the Client only. The report shall not be relied upon or transferred to any other parties without the written agreement of ARP Associates. For the avoidance of any doubt, where ARP Associates enters into a letter of reliance for the benefit of a third party, that third party will be permitted to rely on the report. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party without ARP Associates consent.

Revision Status and Requirements for Future Review

Following receipt of comments from the Lead Local Flood Authority, this revised draft has been prepared for agreement with the Lead Local Flood Authority and Local Planning Authority. The document should be finalised upon completion of construction, including all listed drainage drawing references which should be revised to 'as-built' status.

**This plan should be reviewed periodically to confirm it is meeting the objective of ensuring effective drainage is maintained. The maintenance plan should be revised as necessary to keep systems working effectively.**

## Overview of Drainage Systems

The development is served by separate systems of foul and surface water drainage.

Domestic foul wastewater is discharged to an existing manhole within the southeast development extents, prior to outfalling to a combined public sewer located adjacent to Bradley Road.

Surface water runoff (from building roofs, roads, and other hardstanding areas) is collected by a system of rainwater pipes, road gullies and channel drains, into a piped drainage system which flows by gravity to two above-ground attenuation basins, located within current landscape areas to the east and southeast of the proposed development. Existing on-site drainage will also be utilised as part of the surface water runoff proposals. Surface water is discharged to the public combined sewer located adjacent to Bradley Road, at a maximum rate of 25 l/s, controlled by a vortex flow control device. The system is designed to manage rainfall events up to the '1 in 100 year' event, including an allowance for the projected impacts of climate change.

## Drainage Drawings and Documentation

The following drawings illustrate the drainage systems for this development, and should be kept with the maintenance plan and referred to when considering maintenance requirements:

- 2489.01.SK01.01A Existing Drainage Network Arrangements Sheet 1 of 1
- 2489.01.SK01.02B Proposed Drainage Strategy – Network B Sheet 1 of 1
- 2489.01.SK02.01 Existing Catchment Plan Sheet 1 of 1
- 2489.01.SK02.02A Proposed Impermeable Areas Plan Sheet 1 of 1

Any documentation relating to proprietary drainage components should be kept with the maintenance plan and referred to when considering maintenance requirements.

Any persons undertaking maintenance should ensure they refer to the most recent revision of the listed drawings and documentation for the drainage systems, including 'as-built' drawings when available.

## Maintenance and Management Responsibility

It is proposed that both, foul and surface water drainage systems, including the two above-ground attenuation basins will remain private and be maintained by the existing landowner.

Vehicular access and parking within the development extent will also remain private, meaning any road gullies and/or channel drains will remain private and be maintained by the existing landowner.

## Health and Safety

**All operation, inspection and maintenance should be undertaken by suitably qualified and competent professionals, using safe systems of work.**

**In particular, it should be recognised that some maintenance tasks may necessitate entry into confined spaces – these tasks should only be undertaken by suitably trained operatives, using an appropriate safe systems of work.**

Attention is drawn to the requirements of the Construction Design and Management Regulations 2015, and in particular, the duties and obligations of the Client.

## Drainage Maintenance and Management Regime

As set out above, the landowner shall be responsible for determining and implementing an appropriate maintenance regime for all drainage elements within the development extents.

As a minimum, it is recommended that inspection and maintenance follow the regime set out below. However, the timescales indicated below should be reviewed based on inspections and should be increased in frequency if required.

Notwithstanding any recommendations set out in this document, all proprietary components should be operated/inspected/maintained in accordance with the manufacturer's requirements/specifications.

Further advice on inspection and maintenance of SuDS components is set out in CIRIA publication C753 The SuDS Manual (2015).

<b>Asset/Item:</b>	Guttering/Rainwater Downpipes	
<b>Location/Access:</b>	Located on building units	
<b>Maintenance Schedule</b>	<b>Required Action</b>	<b>Typical Frequency</b>
Regular Maintenance	These should be cleaned at regular intervals. In inclement weather, this frequency is likely to increase.	Bi-annually or as required
Remedial actions	Repair leaks or damage.	As required

<b>Asset/Item:</b>	Gullies/Linear Drainage	
<b>Location/Access:</b>	Located within the site extents as shown on Proposed Drainage Strategy 2489/01/SK01.02B	
<b>Maintenance Schedule</b>	<b>Required Action</b>	<b>Typical Frequency</b>
Regular Maintenance	Gullies and Linear Drainage should be cleaned at regular intervals. Jet-washing and suction-borne methods are recommended, with the contents disposed of at a licenced waste facility.	Bi-annually
	Covers and frames should be inspected at regular intervals, particularly to check line and level, and to ensure integrity, security of hinges and to check line/level is within safe and workable tolerance.	Bi-annually
Remedial actions	Repair covers if damaged.	As required
Monitoring	Inspect Gullies and Linear Drainage to ensure they are in good condition and operating as required.	Annually and after large storms

<b>Asset/Item:</b>	Carrier Drains	
<b>Location/Access:</b>	Located within the site extents as shown on Proposed Drainage Strategy 2489/01/SK01.02B	
<b>Maintenance Schedule</b>	<b>Required Action</b>	<b>Typical Frequency</b>
Regular Maintenance	Carrier Drains should be cleaned at regular intervals. Jet-washing and suction-borne methods are recommended, with the contents disposed of at a licenced waste facility.	Bi-annually
Remedial actions	Repair (In the event of damage or vandalism).	As required
Monitoring	Inspect flow in Carrier Drains (via manholes) to ensure they are in good condition and operating as required	Annually and after large storms
	Conduct CCTV inspection to confirm pipe condition and confirm and requirements for remediation.	Every 3-5 years

<b>Asset/Item:</b>	Manholes/Inspection Chambers	
<b>Location/Access:</b>	Located within the site extents as shown on Proposed Drainage Strategy 2489/01/SK01.02B	
<b>Maintenance Schedule</b>	<b>Required Action</b>	<b>Typical Frequency</b>
Regular Maintenance	Visual inspection of manholes and inspection chambers, to check for any siltation or obstruction to flow, should be undertaken at regular intervals, recommended not more than six months apart.	Bi-annually
	Covers and frames should be inspected at regular intervals, particularly to check line and level, and to ensure integrity, security of hinges and to check line/level is within safe and workable tolerance.	Bi-annually
Remedial actions	Repair covers if damaged.	As required
Monitoring	Inspect Manholes and Inspection Chambers to ensure they are in good condition and operating as required	Annually and after large storms

<b>Asset/Item:</b>	Basin Headwall/s	
<b>Location/Access:</b>	Located at every inlet/outlet into/from the attenuation basin	
<b>Maintenance Schedule</b>	<b>Required Action</b>	<b>Typical Frequency</b>
Regular Maintenance	Visual inspection of the headwall to check for any obstruction to flow or debris, should be undertaken at regular intervals, recommended not more than six months apart.	Bi-annually
	The ground around the headwall should be checked for signs of movement and any erosion.	Bi-annually
	The headwall should be inspected in advance of storm conditions if feasible, and should be re-inspected after heavy storms or sustained periods of inclement weather.	As required
Remedial actions	Should the headwall become damaged, or the surrounding ground is subject to movement or erosion, the structure should be inspected by an Engineer and remedial works prescribed as necessary.	As required

<b>Asset/Item:</b>	Attenuation Basin	
<b>Location/Access:</b>	Located within the site extents as shown on Proposed Drainage Strategy 2489/01/SK01.02B	
<b>Maintenance Schedule</b>	<b>Required Action</b>	<b>Typical Frequency</b>
Regular Maintenance	During the inspections, general operation and structural condition of the inlet/outlet headwalls and any erosion of banks or scour control features should be identified and rehabilitated.	As required
	Vegetation in and on the banks of the basin should be trimmed to establish a dense sward and provide long grass margins which will discourage public access towards the water's edge. Cuttings from any clearance work should be removed from the basin to avoid any blockages downstream.	Twice yearly
	Ensure the basin floor, headwall inlets and outlets are clear from rubbish and natural debris to prevent any blockages – clear if required.	Monthly
Remedial actions	Erosion or any other damage to be repaired by reseeded or re-turfing.	As required
	If a blockage should occur at any headwall inlet/outlet, this is to be removed. Any damage occurred is to be repaired.	As required

<b>Asset/Item:</b>	Vortex Flow Control	
<b>Location/Access:</b>	Located in manhole S6_FC2 and S12_FC1 as shown on Proposed Drainage Strategy 2489/01/SK01.02B	
<b>Maintenance Schedule</b>	<b>Required Action</b>	<b>Typical Frequency</b>
Regular Inspection and Maintenance	The flow control unit should be regularly inspected and maintained as necessary, in accordance with Manufacturer's requirements.	Annually
	The flow control unit should be inspected in advance of storm conditions if feasible and should be re-inspected after heavy storms or sustained periods of inclement weather.	Annually or as required
Occasional Inspection and Maintenance	The sump of the unit should be emptied periodically, using a suction unit and the contents disposed of at a licenced waste facility.	Every 2 years or as required
Remedial Inspection and Maintenance	Repair or replace parts if required. Neoprene seals to be replaced any time the unit is removed from its mountings.	As required
End-of Life Replacement	Replace unit if parts become inoperable or severely degraded over time. Specification of flow control must be such that the same flow characteristics are provided.	60 years