



Former Garage Site, Sullivan Crescent, Harefield



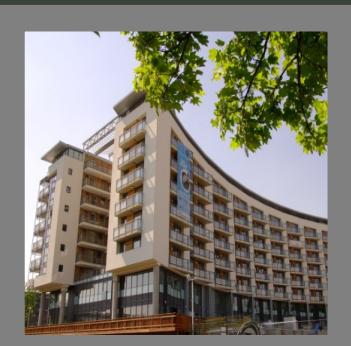
Surface Water Strategy and Maintenance Report

For



Bugler Developments

Project Ref: C7752
Date: April 2024



Consulting Structural and Civil Engineers

Walker Associates Consulting Limited
13 Capricorn Centre, Cranes Farm Road, Basildon, Essex. SS14 3JJ.
Tel: +44 (0)1268 530500 Fax: +44 (0)1268 286628 Email: mail@walker-associates.co.uk

www.walker-associates.co.uk



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1.0 Introduction and General Comments

- 1.1 Walker Associates Consulting Ltd has been commissioned by Bugler Developments, to prepare a drainage maintenance strategy to support their proposed development of the former garage site to the rear of Sullivan Crescent, Harefield.
- 1.2 The site received planning permission on the 10th March 2023 for Erection of no. 4 x two storey terraced houses and no.2 x two storey semi-detached houses, with associated car parking and landscaping works.
- 1.3 This report relates to the clearance of condition 6 of the planning approval which relates to the management of surface water run off and potable water use. Condition 6 read as follow. Further information to cover condition *point vi*) potable water usage will be provided under separate cover:

No development approved by this permission shall be commenced until a scheme for the provision of sustainable water management and water efficiency has been submitted to and approved in writing by the Local Planning Authority. The scheme shall:

- i. Provide information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the site and the measures taken to prevent pollution of the receiving groundwater and/or surface waters;*
- ii. Include a timetable for its implementation; and*
- iii. Provide a management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime.*

The scheme shall also demonstrate the use of methods to minimise the use of potable water through water collection, reuse and recycling and will:

- iv. Provide details of water collection facilities to capture excess rainwater;*
- v. Provide details of how rain and grey water will be recycled and reused in the development;*
- vi. Provide details of how the dwellings will achieve a water efficiency standard of no more than 110 litres per person per day maximum water consumption (to include a fixed factor of water for outdoor use of 5 litres per person per day in accordance with the optional requirement defined within Approved Document G of the Building Regulations). Thereafter the development shall be implemented and retained/maintained in accordance with these details for as long as the development remains in existence.*

REASON

To ensure the development does not increase the risk of surface water flooding in accordance with Policies DMEI 9 and DMEI 10 of the Hillingdon Local Plan Part 2 (2020) and Policies SI2 and SI 13 of the London Plan (2021).

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2.0 Drainage Strategy

- 2.1 The existing development consist of a former garage site and is almost completely hard paved. Surface water run off discharges at an unrestricted rate to the existing Thames Water sewer network.
- 2.2 The latest guidance regarding surface water drainage hierarchy for new development requires that surface water runoff should where possible be dealt with at source by means of infiltration or harvesting. Where this is not possible, then surface water discharge should be directed firstly to a local water course, or where there are none to a public sewer.
- 2.3 The soil conditions preclude the use of infiltration devices for the discharge of surface water. There are no water courses within the vicinity of the site and therefore a positive connection to the local drainage system has been proposed. Rainwater harvesting has been considered however the ratio of occupancy to available roof area means that it would not be feasible as there would be insufficient roof yield to serve the buildings. A harvesting calculation can be found in **Appendix 2**. Some Harvesting will however be provided within external water butts to assist with irrigation of garden areas.
- 2.4 In line with current guidance flow rates for new developments shall where possible not exceed the equivalent green field run off rates or for brown field sites provide betterment and as a minimum not exceed the predevelopment run off rates. The existing green field run off rates for the site have been calculated using the IH124 method as follows, and a calculation sheet can be found in **Appendix 3** of this report.

Qbar	0.69l/s
1 in 1 year	0.59l/s
1 in 30 year	1.59l/s
1 in 100 year	2.2l/s

- 2.5 As the site is relatively small it will not be possible to restrict run off rates fully down to green field levels for all storm return periods, whilst maintaining a practical outfall orifice size that is not at risk of blockage. It is therefore proposed to restrict run off to 2l/s for all storm events and provide attenuation on site to prevent flooding for storms up to an including the 1 in 100year event plus 40% allowance for climate change. Refer to **Appendix 5** for associated drainage calculations.
- 2.6 Flow restriction will be provided by means of a Hydrobrake flow control device. Attenuation will be provided within the tanked permeable paving systems, which is used throughout the site. This paving system not only provides attenuation but will also provide significant benefits in terms of water quality and pollution prevention. A pollution calculation in line with the SuDS Manual Simple Index Approach has been provided in **Appendix 4**.

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3.0 Drainage Maintenance

3.1 General Maintenance

Covers and gratings

During any routine inspection, the condition of manhole covers, gully gratings, Aco gratings etc. should be checked for damage, deformation, and settlement.

Sewer pipes

Pipelines are designed to be self-cleansing so should not require regular maintenance. Maintenance will therefore be restricted to resolving problems as they occur such as blockage or collapse.

Settlement of paved surfaces may be an indication of a collapsed sewer / drain, check the position of the fault against known drainage runs i.e. between manholes.

Manholes

The most common problems are settlement of levelling brickwork and break up of mortar bedding / benching to the frame. Block paving is a particular problem around the manhole frame where there are often small 'cuts' of paving with insufficient bedding, resulting in the rapid displacement of the pieces. Remedial action is to re-bed the segments in mortar and dust with dry paving sand. Other problems may not be apparent unless the manhole cover is lifted to expose the chamber, benching, and channels. With correctly constructed manholes there should be no need to visually inspect for at least five years. On inspection the following should be checked:

Infiltration, ground water entering the chamber through construction joints, seepage, or squirting / gushing (proprietary sealants are available but excavation and partial reconstruction may be required).

Damaged benching should not really occur unless by high pressure infiltration or poor construction. Check for deposition of detritus which may cause blockages of the sewer / drain. Can normally be jetted or hosed clear, larger items will need to be removed.

Deep, over 1.8m, chambers must not be entered unless two persons are present and only if gas monitoring equipment is available. Note, also that it may take two persons to lift the cover, using only the correct keys.

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Pre-treatment Devices

Gullies, pots or chambers should be inspected and cleared out annually by suitable plant. Aco drains, particularly gratings susceptible to damage in heavily trafficked areas. The channels are designed to be self-cleansing, but leaves should be cleared around autumn and they should be checked for signs of blockage and jetted as necessary annually.

Remedial actions are to be carried out following identification of the problem(s). The works must only be undertaken by a reputable civil engineering contractor, carrying appropriate public liability insurance.

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Permeable Pavements: Operation & Maintenance Requirements shall be as per Table 3.1 below

Table 3.1: Permeable Pavements: Operation & Maintenance Requirements		
Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Brushing & Vacuuming (Standard cosmetic sweep over whole surface)	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site specific observations of clogging or manufacturers' recommendations.
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate 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 50mm 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 3 months after installation.
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action.	3-monthly, 48hrs after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually.
	Monitor inspection chambers	Annually.

Source: CIRIA C753, Table 20.15

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4.0 Adoptions

4.1 The adoption/maintenance responsibilities of the proposed SuDS features and underground drainage system will be as the responsibility of the London Borough of Hillingdon, who are the owners of the site.

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Appendix 1 - Drainage Plan & Details

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Appendix 2 – Harvesting Calculation

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Appendix 3 – Greenfield Run-off Calculation

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Appendix 4 – Pollution Index Calculation

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Appendix 5 – Causeway Flow Simulation Calculations

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