

The London Sustainable Drainage Proforma

Introduction

This proforma is intended to accompany a drainage strategy prepared for a planning application where required by national or local planning policy. It should be used to summarise the key outputs from the strategy to allow assessing officers at the Lead Local Flood Authority (LLFA) to quickly assess compliance with sustainable drainage (SuDS) planning

The proforma is divided into 4 sections, which are intended to be used as follows:

- 1. Site and project information - Provide summary details of the development, site and drainage
- 2. Proposed discharge arrangement – Summarise site ground conditions to determine potential for infiltration. Select a surface water discharge method (or mix of methods) following the hierarchical approach set out in the London Plan.
- 3. Drainage strategy – Prioritise SuDS measures that manage runoff as close to source as possible and contribute to the four main pillars of SuDS; amenity, biodiversity, water quality and water quantity.
- 4. Supporting information – Provide cross references to the page or section of the drainage strategy report where the detailed information to support each element can be found. This may be more than one reference for each

Policy

Drainage strategies for developments in the London Borough of Hillingdon need to comply with the following policies on SuDS:

- 1. [London Borough of Hillingdon Local Plan policies EM 6 and DMEI 10](#)
- 2. [London Plan policy 5.13](#) and draft [New London Plan policy SI13](#)
- 3. [The National Planning Policy Framework \(NPPF\)](#)

Technical Guidance

- Post-development surface water discharge rate should be limited to greenfield runoff rates. Proposals for higher discharge rates should be agreed with the LLFA ahead of submission of the Planning Application. Clear evidence should be provided with the Planning Application to show why greenfield rates cannot be achieved.
- Greenfield runoff rate is the runoff rate from a site in its natural state, prior to any development. This should be calculated using one of the runoff estimation methods set out in Table 24.1 of CIRIA C753 The SuDS Manual.
- Attenuation storage volumes required to reduce post-development discharge rates to greenfield rates should be calculated using one of the runoff estimation methods set out in Table 24.1 of CIRIA C753 The SuDS Manual.
- ‘CC’ refers to climate change allowance from the current Environment Agency guidance.
- An operation and maintenance strategy for proposed SuDS measures should be submitted with the Planning Application and include the details set out in section 32.2 of CIRIA C753 The SuDS Manual. The manual should be site-specific and not directly reproduce parts of The SuDS Manual.
- Other useful sources of guidance are:
 - [o London Borough of Hillingdon sustainable drainage requirements](#)
 - [o The London Plan Sustainable Design and Construction SPG](#)
 - [o DEFRA non-statutory technical standards for sustainable drainage](#)
 - [o Environment Agency climate change guidance](#)
 - [o CIRIA C753 The SuDS Manual](#)

1. Project & Site Details	Project / Site Name (including sub catchment / stage / phase where appropriate)	9 Nestles Avenue Planning
	Address & post code	9 Nestles Avenue, Hayes, UB3 4SA
	OS Grid ref. (Easting, Northing)	E 509851 N 179228
	LPA reference (if applicable)	
	Brief description of proposed work	Demolition of existing building to re-develop to provide 103 residential units over 11 storeys.
	Total site Area	2330 m ²
	Total existing impervious area	2330 m ²
	Total proposed impervious area	1080 m ²
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	The site is not in a surface water flood risk catchment.
	Existing drainage connection type and location	Gravity drained to MH 8122
	Designer Name	George Westgarth
	Designer Position	Civil Engineer
	Designer Company	Heyne Tillett Steel

2. Proposed Discharge Arrangements	2a. Infiltration Feasibility	
	Superficial geology classification	N/A
	Bedrock geology classification	N/A
	Site infiltration rate	Insufficient space for soakaway infiltration
	Depth to groundwater level	m below ground level
	Is infiltration feasible?	To be use in rain garden frontage
	2b. Drainage Hierarchy	
		Feasible (Y/N)Proposed (Y/N)
	1 store rainwater for later use	Y Y
	2 use infiltration techniques, such as porous surfaces in non-clay areas	Y Y
	3 attenuate rainwater in ponds or open water features for gradual release	N N
	4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y Y
	5 discharge rainwater direct to a watercourse	N N
	6 discharge rainwater to a surface water sewer/drain	Y Y
	7 discharge rainwater to the combined sewer.	N N
	2c. Proposed Discharge Details	
	Proposed discharge location	Discharge is proposed into SW MH No.8122
	Has the owner/regulator of the discharge location been consulted?	Yes

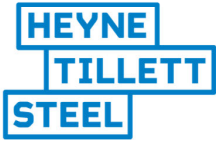


3. Drainage Strategy	3a. Discharge Rates & Required Storage				
		Greenfield (GF) runoff rate (l/s)	Existing discharge rate (l/s)	Required storage for GF rate (m ³)	Proposed discharge rate (l/s)
	Q _{bar}	0.9			
	1 in. 1	N/A	26.4	60	1.5
	1 in. 30	N/A	76.9	69	1.5
	1 in. 100	N/A	100	89	1.5
	1 in. 100 + CC			146	1.5
	Climate change allowance used		40%		
	3b. Principal Method of Flow Control		Tank and hydro-brake		
	3c. Proposed SuDS Measures				
		Catchment area (m ²)	Plan area (m ³)	Storage vol. (m ³)	
	Rainwater harvesting	521m ²		N/A	
	Infiltration systems	0		0	
	Green roofs	0	0	0	
	Blue roofs	388m ²	320m ²	41.3m ³	
	Filter strips	0	0	0	
	Filter drains	0	0	0	
Bioretention / tree pits	0	0	0		
Pervious pavements	681m ²	341m ²	20m ³		
Swales	0	0	0		
Basins/ponds	0	0	0		
Attenuation tanks	740m ²		105m ³		
Total	2330m ²	661m ²	166.3m ³		

4. Supporting Information	4a. Discharge & Drainage Strategy	Page/section of drainage report
	Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	N/A for SuDS techniques.
	Drainage hierarchy (2b)	Section 7, page 8.
	Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Section 7, page 8 & 9. Appendix B, F & J
	Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Section 7, page 8 & 9. Appendix G & K
	Proposed SuDS measures & specifications (3b)	Section 7, page 8 & 9. Appendix G
	4b. Other Supporting Details	Page/section of drainage report
	Detailed Development Layout	Appendix G
	Detailed drainage design drawings, including exceedance flow routes	Appendix G, I & K
	Detailed landscaping plans	Appendix D
	Maintenance strategy	Appendix L
	Demonstration of how the proposed SuDS measures improve:	Section 7, page 8 & 9
	a) water quality of the runoff?	Section 7, page 8 & 9
	b) biodiversity?	Section 7, page 8 & 9
	c) amenity?	N/A

Appendix L

Maintenance Strategy



Drainage Inspection and Maintenance Strategy

This document has been prepared to support the inspection and maintenance of the proposed below ground drainage of the Nestle site. The drainage network comprises surface and foul water drainage systems:

- Surface water network will route all the rainwater towards TW SW pipeline. Blue/Green roof and permeable paving surface water will be routed towards an attenuation tank, which then routes the surface water through a hydro-brake into the TW SW pipeline.
- Foul water network from above ground level will be routed towards the outfall manhole via gravity.

In accordance with CIRIA C625 it is recommended that a private SuDS maintenance agreement is undertaken as a simple contract between the property owner and the maintenance provider (the maintainer). It is mainly to facilitate continuing maintenance of the SuDS that are in private ownership. The maintenance requirements are in accordance with the CIRIA C753 SuDS Manual 2015 and product manufacturer’s requirements.

The following Drainage / SuDS measures are proposed within the development:

- General Drainage:

Maintenance Period	Maintenance Task	Frequency
Regular maintenance	Inspect and identify areas that are not operating correctly. If required, take remedial action.	Monthly
	Inspect surface structures and covers removing obstructions and silt as necessary.	Monthly or as required
	Check there is no physical damage.	
	Remove overgrown vegetation 1m min. around structures and keep hard aprons free from silt and debris.	
Occasional Maintenance	Remove sediment from pre-treatment structures (e.g. gullies, channels silt traps).	Six-monthly or as required
	Remove cover and inspect inside, ensuring water is flowing freely and that the exit route for water is unobstructed.	Annually or as required
	Remove debris and silt.	
	Undertake inspection after leaf fall in autumn.	
Remedial Actions	Repair/rehabilitation of inlets, outlets, overflows and vents.	As required
Monitoring	Inspect all manholes, inspection chambers, inlets, outlets, overflows and vents to ensure they are in good condition and operating as designed.	Annually or after large storms.

- Inlets, Outlets and Inspection Chambers:

Maintenance Period	Maintenance Task	Frequency
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Regular Maintenance	Inspect surface structures and covers removing obstructions and silt as necessary.	Monthly or as required
	Check there is no physical damage. Remove overgrown vegetation 1m min. around structures and keep hard aprons free from silt and debris.	
	Remove cover and inspect inside, ensuring water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn.	Annually
Occasional Maintenance	Check topsoil levels are 20mm above edges off baskets and chambers to avoid mower damage.	As necessary
Remedial Work	Unpack stone in basket features and unblock or repair and repack stone as design detail as necessary.	As required
	Repair physical damage is necessary.	

- Attenuation Tank:

Maintenance Period	Maintenance Task	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action (for 3 months following installation).	Monthly
	Inspect and identify any areas that are not operating correctly. If required, take remedial action (following initial 3-month period).	Six Monthly
	Remove sediment from pre-treatment structures.	Annually
Remedial Actions	De-silt as required.	As Required
Monitoring	Inspect and carry out essential recovery works to return the feature to full working order.	Following all significant storm events

- Flow control Structures:

Maintenance Period	Maintenance Task	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action (for 3 months following installation).	Monthly
	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Six Monthly
	Remove sediment from pre-treatment structures.	
Monitoring	Inspect and carry out essential recovery works to return the feature to full working order.	Following all significant storm events

- Green / Blue / Brown Roofs:

Maintenance Period	Maintenance Task	Frequency
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Regular Maintenance	During establishment, replace dead plants as required (for 12 months following installation).	Monthly
	Mow grasses (where required) and remove resultant clippings.	
	Remove fallen leaves and debris from deciduous plant foliage.	Six Monthly
	Remove nuisance and invasive vegetation, including weeds.	
	Remove debris & litter to prevent clogging of inlet drains and interference with plant growth.	
	Noxious weed treatment (3 times a year).	
Occasional Maintenance	Replace dead plants as required (typically in the Autumn).	Annually
	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes, and roof structure for proper operation, integrity of waterproofing and structural stability, act where required.	
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources, act where required.	
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system, act where required.	
	Inspect underside of roof for evidence of leakage, act where required.	
Remedial Action	Inspect and document the presence of wildlife.	Following all significant storm events
	Inspect and carry out essential recovery works to return the feature to full working order.	

- Hydro-Brake (Flow Control):

Maintenance Period	Maintenance Task	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for three months, then every six months.
	Remove sediment from pre-treatment structures.	
Remedial Actions	Repair/rehabilitation of Hydro-Brake.	As required
	If problems are experienced, please contact the company (Hydro International) so that an investigation may be made. Contact: enquiries@hydro-int.com (+44 (0)118 933 1325).	
Monitoring	Inspect and with a hose down if required.	Annually or after large storms.

- Permeable paving system:

Maintenance Period	Maintenance Task	Frequency
Regular maintenance	Inspect for sediment and debris in the inlet chambers and trim any roots that may be causing blockages.	Annually or as required based on inspections
	Cleaning of gutters and any filters on downpipes	
	Brushing and vacuuming (standard cosmetic sweep over whole surface).	Once a year, after autumn leaf fall, or as required,
Occasional maintenance	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying.	As required, based on inspections

Remedial Actions	Remedial work to any depressions, rutting, cracked or broken blocks considered detrimental to the permeable paving performance.	As required
	Rehabilitation of surface and upper substructure by remedial sweeping.	Every 10 to 15 years or as required
	Jet washing and suction cleaning will substantially reinstate pavement to 90% efficiency (CIRIA RP992).	As required
Monitoring	Initial inspection.	Monthly for three months after installation
	Inspect inspection chambers and note rate of sediment accumulation and establish appropriate brushing frequencies.	Monthly in the first year and then annually
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action.	Annually
	Monitor effectiveness of permeable pavement and when water does not infiltrate immediately advise Client of possible need for reinstatement of top layers or specialist cleaning.	As required

- Rain Garden / Stormwater Planter:

Maintenance Period	Maintenance Task	Frequency
Regular maintenance	Litter and debris removal .	Monthly
	Mulching (where required).	
	Inspect/check all inlets, outlets, surface and overflows (where required) to ensure that they are in good condition, free from blockages and operating as designed. Act where required.	
	Removal of nuisance and invasive vegetation.	Six Monthly
	Pruning and trimming of trees.	Annually
	Inspect and document the presence of wildlife.	
	Check for poor vegetation growth due to lack of sunlight or dropping of leaf litter and cut back adjacent vegetation where required.	
Remedial Actions	Repair erosion or other damage by re-mulching or re-seeding.	As Required
	Re-seed areas of poor vegetation growth. Alter plant types to better suit conditions, if required.	
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface (typically every 60-month period).	
	Remove build-up of sediment, reinstate design levels (typically every 60-month period).	
	Remove and dispose of oils or petrol residues using safe standard practices.	
Monitoring	Inspect and carry out essential recovery works to return the feature to full working order.	Following all significant storm events

- Rainwater harvesting tank:

Maintenance Period	Maintenance Task	Frequency
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Regular Maintenance	Inspection of the tank for damage and debris/sediment build-up. Inspect inlets/outlets/withdrawal devices, overflow areas, filters.	Annually or following poor performance
	Cleaning of tank, inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris.	Annually or following poor performance
Occasional Maintenance	Cleaning and/or replacement of any filters.	Three monthly or as required
Remedial Action	Repair / rehabilitation of inlets, outlets, overflows or damage to tank.	As required

Reference shall be made to CIRIA publication C753 (The SuDS Manual) and to the relevant maintenance guidance from the products manufacturers.

