Camden GREATERLONDONAUTHORITY LoDEG

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)

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

Policy

Drainage strategies for developments in the London Borough of [insert borough] need to comply with the following policies on SuDS:

1. Camden Local Plan Policy CC3
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
- 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
- '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:
  - Camden Planning Guidance 'Water and Flooding'
  - The London Plan Sustainable Design and Construction SPG
  - DEFRA non-statutory technical standards for sustainable drainage
  - Environment Agency climate change guidance
  - CIRIA C753 The SuDS Manual
  - Camden's 'SuDS in planning applications' webpage

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1. Project & Site Details

Project / Site Name (including sub-catchment / stage / phase where appropriate)	Channing Junior School - Car Park
Address & post code	Channing Junior School, 1 Highgate High St, London N6 5JR, United Kingdom
OS Grid ref. (Easting, Northing)	E 528712 N 187290
LPA reference (if applicable)	
Brief description of proposed work	Small area of car park to be resurface
Total site Area	565 m^2
Total existing impervious area	565 m^2
Total proposed impervious area	565 m^2
Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No
Existing drainage connection type and location	to ground
Designer Name	Carmel Lennon
Designer Position	Associate Director
Designer Company	Heyne Tillett Steel

2. Proposed Discharge Arrangements

2a. Infiltration Feasibility

Superficial geology classification	Made Ground, Bagshot Formation	
Bedrock geology classification	Claygate Member	
Site infiltration rate	0.000114792	m/s
Depth to groundwater level	c. 4	m below ground level
Is infiltration feasible?	Yes	

2b. Drainage Hierarchy

	Feasible (Y/N)	*Proposed (Y/N)*
1 store rainwater for later use	Y	N
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	N
5 discharge rainwater direct to a watercourse	N	N
6 discharge rainwater to a surface water sewer/drain	N	N
7 discharge rainwater to the combined sewer.	Y	N

2c. Proposed Discharge Details

Proposed discharge location	to ground via permeable paving subbase
Has the owner/regulator of the discharge location been consulted?	NA

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)*
Qbar	0.26			
1 in 1	0.22			
1 in 30	0.59			
1 in 100	0.81			
1 in 100 + CC				
Climate change allowance used		40%		

3b. Principal Method of Flow Control	NA

3c. Proposed SuDS Measures

	Catchment area (m^2)	*Plan area (m^2)*	*Storage vol. (m^3)*
Rainwater harvesting	0		0
Infiltration systems	0		0
Green roofs	0	0	0
Blue roofs	0	0	0
Filter strips	0	0	0
Filter drains	0	0	0
Bioretention / tree pits	0	0	0
Pervious pavements	565	0	0
Swales	0	0	0
Basins/ponds	0	0	0
Attenuation tanks	0		0
Total	565	0	0

4. Supporting Information

4a. Discharge & Drainage Strategy	*Page/section of drainage report*
Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Refer to attachments
Drainage hierarchy (2b)	See above
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	NA
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	NA
Proposed SuDS measures & specifications (3b)	Refer to contractors details

4b. Other Supporting Details	*Page/section of drainage report*
Detailed Development Layout	Refer to architects drawings
Detailed drainage design drawings, including exceedance flow routes	Refer to architects drawings
Detailed landscaping plans	Refer to architects drawings
Maintenance strategy	See attachments
Demonstration of how the proposed SuDS measures improve:	
a) water quality of the runoff?	use of permeable paving
b) biodiversity?	NA
c) amenity?	NA

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Carmel Lennon
Site name:	Channing Junior School
Site location:	Highgate

Site Details

Latitude:	
Longitude:	
Reference:	1510773876
Date:	Dec 21 2021 08:49

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 0.0565

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics	Default	Edited
SOIL type:	0	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.00	0.47

Hydrological characteristics	Default	Edited
SAAR (mm):	0	661
Hydrological region:	1	1
Growth curve factor 1 year:	-	0.85
Growth curve factor 30 years:	-	2.3
Growth curve factor 100 years:	-	3.19
Growth curve factor 200 years:	-	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	0	0.26
1 in 1 year (l/s):		0.22
1 in 30 years (l/s):		0.59
1 in 100 year (l/s):		0.81
1 in 200 years (l/s):		0.95

GROUND CONDITIONS

The investigation has generally encountered the expected ground conditions in that, beneath a moderate to significant thickness of made ground, extending to depths of between 0.32 m and 2.90 m (115.49 m OD and 110.20 m OD), the Bagshot Formation overlies the Claygate Member, proved to the maximum depth investigated of 17.45 m. The Bagshot Formation generally comprises fine to coarse sand with varying quantities of flint gravel and nodules of sandstone. This stratum has been interpreted to extend to depths of between 3.25 m and 5.60 m (111.25 m OD and 108.40 m OD). The Claygate Member generally comprises light brown silty fine sand, extending to depths of 11.55 m (102.10 m OD) and 12.20 m (101.80 m OD), although an upper horizon of clay was noted locally. At depth, the Claygate Member becomes stiff locally firm dark grey silty clay and was proved to the maximum depth investigated of 17.45 m (96.55 m OD). Groundwater was encountered during drilling at depths of 4.00 m, 5.10 m and 15.50 m and subsequent monitoring of the installed standpipes has measured water at depths of 3.89 m and 4.80 m (110.56 m OD and 109.15 m OD).

Carmel Lennon

From: Alex Lever <AlexLever@curoconstruction.com>
Sent: 13 May 2020 18:06
To: Carmel Lennon; Gordon Armstrong-Payne
Cc: Kieran Barnes; Lee Anderson; Joseph Stapleton
Subject: FW: Infiltration test results

Hi Carmel/Gordon

Please see a table below of the results taken form the infiltration test carried out last week. This test was carried out using the shingle backfill and perforated pipe as per the guidance issued by yourself. As I explained we had quite the challenge on filling the area again as it drained extremely quickly which you will note from the results. Hopefully this data is sufficient to complete the necessary calculations and finalise the storm water design.

Excavation depth = 1800mm
Excavation width = 500mm
Excavation length = 1700mm
Required fill level = 1800mm

Vp75-25 = 0.765m3
Ap50 = 4.81m2

Channing Junior School Infiltration Test				
	Time at level (mm:ss)			
Water level (mm)	Test 1	Test 2	Test 3	Test 4
Test start time	11.20am	12.45pm	13.53pm	2.44pm
1600	0.24	0.15	0.16	0.16
1400	0.59	0.50	0.55	0.56
1200	1.31	1.26	1.30	1.37
1000	2.36	2.30	2.43	2.42
800	6.00	5.35	6.15	6.19
600	12.59	11.40	12.51	13.30
400	24.08	25.10	27.00	28.00

Should you have any queries or require any further information please do not hesitate to contact me.

Regards,

Alex Lever
Project Manager

Mobile: 07730683768
Channing Junior School, Highgate Hill, London, N6 5HF
www.curoconstruction.com

BRE 365 Soakaway Calculations

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

			Volume
Length		1.7	
Width		0.5	
Depth	100%	1.8	
	75%	1.35	1.1475
	50%	0.9	0.765
	25%	0.45	0.3825
ap50	4.81		
Vp75-25	0.77		

		Test 1	Test 2	Test 3	Test 4
Time	100%	11:20:00	12:45:00	13:53:00	14:44:00
	75%	50.25	41.25	45.25	46.00
	50%	258.00	242.50	269.00	270.50
	25%	1280.75	1386.50	1415.75	1431.50
	75% - 25%	1230.50	1345.25	1370.50	1385.50
	mins				
	sec	1230.50	1345.25	1370.50	1385.50

Infiltration Rates (m/s)	1.29E-04	1.18E-04	1.16E-04	1.15E-04
m/hr	0.47	0.43	0.42	0.41
mm/hr	465.30	425.61	417.77	413.25

Info from site:

Excavation depth = 1800mm
Excavation width = 500mm
Excavation length = 1700mm
Required fill level = 1800mm

Vp75-25 = 0.765m3
Ap50 = 4.81m2

Channing Junior School Infiltration Test

Water level (mm)	Time at level (mm:ss)			
	Test 1	Test 2	Test 3	Test 4
Test start time	11.20am	12.45pm	13.53pm	2.44pm
1600	24	15	16	16
1400	59	50	55	56
1200	91	86	90	97
1000	156	150	163	162
800	360	335	375	379
600	779	700	771	810
400	1448	1510	1620	1680