



P02	11.10.23	Updated based on latest plans and landscape bund	SW	SH
P01	03.05.23	Preliminary issue for comment	SW	SH
Rev	Date	Description	By	Chk
Amendments				
Project				
NUTFIELD GREEN				
PROPOSED SURFACE WATER DRAINAGE STRATEGY				
Client				
MACE LIMITED				
				
Office Address Telephone & Fax numbers mail@watermangroup.com www.watermangroup.com				
Suitability				
COORDINATION S1				
Designed By	SW	Director	SH	Waterman Ref
Drawn By	SW	Date	03/05/2023	WIE19222
			Scales @ A1	1:2000
Project	Originator	Volume	Level	Type
19222-WIE-ZZ-XX-DR-D-92001				
P02				

I. Surrey County Council Pro-forma

Appendices

Nutfield Green Park

Project Number: WIE19222

Document Reference: WIE19222-100-R-1-3-1-FRA

Surface Water Drainage Summary Pro-forma

Introduction

Surrey County Council (SCC) as Lead Local Flood Authority (LLFA) recommends this pro-forma is completed in full and should be submitted with any planning application which seeks permission for 'major' development. The information contained in this form will be used by SCC in its role as LLFA as a 'statutory consultee' on Sustainable Drainage Systems (SuDS) for all 'major' planning applications. The pro-forma should be completed in conjunction with the [SCC SuDS Design Guidance](#). The pro-forma will accompany the site-specific Flood Risk Assessment and Drainage Strategy submitted as part of the planning application.

Please complete this pro-forma in full for full applications and the coloured sections for outline applications. This will help us identify what information has been included and will assist in our review process.

All bracketed numbers refer to the relevant note on page 5 of this document.

Site Details

1.0 Site Detail Questions

Question number	Question	Answer (to be completed or delete as applicable)	Required
1.1	Planning application reference (if known)	Not known	Outline & Full
1.2	Site name	Nutfield Green Park	Outline & Full
1.3	Total application site area (1) (in hectares)	58.8ha	Outline & Full
1.4	Predevelopment use (4)	Mixture of grassland, blocks of self-seeding woodland and waterbodies with an area of the former infrastructure remains, such as access roads and pipework and former settlement lagoons.	Outline & Full

1.5	Urban Creep applicable	No – total development area conservatively assumed as impermeable	Outline & Full
1.6	If Urban Creep required, factor applied (percentage)	10%	Outline & Full
1.7	Proposed design life / planning application life (in years)	100 years	Outline & Full
1.9	Have agreements in principle (where applicable) for discharge been provided	Yes – TBC following review from SCC	Outline & Full

2.0 Method(s) of Discharge (5)

Question number	Question	Answer (delete as applicable)	Required
2.1	Reuse	TBC	Full
2.2	Infiltration	No	Full
2.3	Hybrid	No	Full
2.4	Watercourse	Yes	Full
2.5	Surface Water Sewer	No	Full
2.6	Combined sewer	No	Full

Calculation Inputs

3.0 Calculation input questions

Question number	Question	Answer (to be completed or delete as applicable)	Required
3.1	Area within proposed site which is drained by SuDS (2) (in hectares)	6.93 ha	Outline & Full
3.2	Impermeable area drained predevelopment (3) (in hectares)	0 ha	Outline & Full
3.3	Impermeable area drained post development (3) (in hectares)	4.64 ha	Outline & Full
3.4	Additional impermeable area (Question 3.3 minus Question 3.2) (in hectares)	4.64 ha	Outline & Full
3.5	Method for assessing greenfield runoff rate	IH124	Outline & Full
3.6	Method for assessing brownfield runoff rate (if applicable)	MicroDrainage	Outline & Full
3.7	Coefficient of runoff (6) (Cv)	1.0	Outline & Full
3.8	Source of rainfall data (FEH Preferred)	FEH	Outline & Full

3.9	Climate change factor applied (percentage)	40%	Full
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4.0 Attenuation (positive outlet) (13)

Question number	Question	Answer (to be completed or delete as applicable)	Required
4.1	Drainage outlet at risk of drowning (elevated water levels in watercourse/sewer)	No	Full
4.2	Invert level at final outlet (in metres above ordnance datum)	80.5	Full
4.3	Design level used for surcharged water level at outlet (13) (in metres above ordnance datum)	NA	Full

5.0 Infiltration (Discharge to Ground)

Question number	Question	Answer (to be completed or delete as applicable)	Required
5.1	Have infiltration tests been undertaken	No – infiltration is not considered feasible due to site constraints	Outline & Full
5.2	If yes, which method has been used	NA	Outline & Full
5.3	Infiltration rate (where applicable) (in metres per second)	NA	Outline & Full
5.4	Depth to highest known ground water table (in metres above ordnance datum)		Full
5.5	Depth of infiltration feature (in metres above ordnance datum)		Full
5.6	Factor of safety used for sizing infiltration storage		Full

Calculation Outputs

Section 6.0, 7.0 and 8.0 refer to sites where storage is provided by full attenuation or partial infiltration. For sites where all flows are infiltrated to ground go straight to Section 9.0.

6.0 Greenfield runoff rates

Question number	Question	Answer (to be completed)	Required
6.1	1 in 1 year rainfall (in litres per second)	286.0	Outline & Full

6.2	1 in 30 year rainfall (in litres per second)	773.8	Outline & Full
6.3	1 in 100 year rainfall (in litres per second)	1073.1	Outline & Full
6.4	Qbar (in litres per second)	336.6	Outline & Full

7.0 Brownfield runoff rates (if applicable)

Question number	Question	Answer (to be completed)	Required
7.1	1 in 1 year rainfall (in litres per second)	48.1 - assumed as Q2	Outline & Full
7.2	1 in 30 year rainfall (in litres per second)	51.6	Outline & Full
7.3	1 in 100 year rainfall (in litres per second)	53.4	Outline & Full

8.0 Proposed maximum rate of runoff from site (incl. Urban Creep) (7)

Question number	Question	Answer (to be completed)	Required
8.1	1 in 1 year rainfall (in litres per second)	48.1	Outline & Full
8.2	1 in 30 year rainfall (in litres per second)	51.6	Outline & Full
8.3	1 in 100 year rainfall plus climate change allowance (in litres per second)	53.4	Outline & Full

9.0 Attenuation storage to manage flow rates from site (inclusive of Climate Change Allowance and Urban Creep)

Question number	Question	Answer (to be completed)	Required
9.1	Volume of Storage for the 1 in 100 year plus Climate Change Allowance (9) (in metres cubed)		Full
9.2	50% storage drain down time for 1 in 30 year rainfall (in hours)		Full

10.0 Volume control provision

Question number	Question	Answer (to be completed)	Required
10.1	Interception losses (11) (in metres cubed)		Full
10.2	Rain harvesting (in metres cubed)		Full
10.3	Infiltration (in metres cubed)		Full
10.4	Attenuation (in metres cubed)		Full
10.5	Separate volume designated as long-term storage (12) (in metres cubed)		Full
10.6	Total volume control (sum of inputs for Questions 10.1 to 10.5) (in metres cubed)		Full

11.0 Site storage volumes (for sites proposing full infiltration only)

Question number	Question	Answer (to be completed)	Required
11.1	Volume of Storage for the 1 in 30 year (8)		Full
11.2	Volume of Storage for the 1 in 100 year plus Climate Change Allowance (10)		Full

Notes

1. All area within the proposed application site boundary to be included.
2. The site area which is positively drained includes all green areas which drain to the SuDS system and area of surface SuDS features. It excludes large open green spaces which do not drain to the SuDS system.
3. Impermeable area should be measured pre and post development. Impermeable surfaces include roofs, pavements, driveways and paths; where runoff is conveyed to the drainage system.
4. Predevelopment use may impact on the allowable discharge rate. The LLFA will seek for reduction in flow rates to greenfield (SCC SuDS Design Guidance).
5. Runoff may be discharged via one or more methods.
6. Sewers for Adoption 7th Edition recommends a Cv of 100% when designing drainage for impermeable area (assumes no loss of runoff from impermeable surfaces) and 0% for permeable areas. Where lower Cv's are used the applicant should justify the selection of Cv.
7. It is Surrey County Council's preference that discharge rates for all events up to the 1 in 100 year rainfall event plus climate change match the greenfield rate for the same rainfall event.
8. Storage for the 1 in 30 year rainfall event must be fully contained within the SuDS components. Note that standing water within SuDS components such as ponds, basins and swales is not classified as flooding. Storage should be calculated for the critical duration rainfall event.
9. Runoff generated from rainfall events up to the 1 in 100 year rainfall event will not be allowed to leave the site in an uncontrolled way. Temporary flooding of designated areas to shallow depths and velocities may be acceptable.
10. Climate change is specified between 10% and 40% increase to rainfall intensity depending upon the design life of the development. Sensitivity testing should be carried out up to the 40% climate change allowance.
11. Where Source Control is provided Interception losses will occur. An allowance of 5mm rainfall depth can be subtracted from the net inflow to the storage calculation where interception losses are demonstrated. The Applicant should demonstrate use of sub-catchments and source control techniques. Further information is available in the SCC SuDS Design Guide.
12. Flows within long term storage areas should be infiltrated to the ground or discharged at low flow rate of maximum 2 l/s/ha.
13. Careful consideration should be used for calculations where flow control / storage is likely to be influenced by surcharged sewer or peak levels within a watercourse. Calculations should demonstrate that risk of drowned outlet has been taken into consideration. Vortex controls require conditions of free discharge to operate as per specification.

J. Peak Foul Water Flow Rate Calculations

Appendices

Nutfield Green Park

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		Dry Weather Flow Rate (per day)	Source	Number of	Factor	Profile (hours)	Peak Flow Rate (litres/second)
Residential							
Existing property =	160 litres/person/day	400.0 litres per unit	Thames Water Guidelines (2016)	0 existing units	2.12	24	0.0
New property =	125 litres/person/day	312.5 litres per unit	Thames Water Guidelines (2016)	166 proposed units			1.3
Occupancy =	2.5 persons						
Hotel		500.0 litres per room	British Water (2013)	0 rooms	3	24	0.0
Student Accommodation		200.0 litres per bed	Thames Water Guidelines (2016)	0 beds	3	24	0.0
Offices		750.0 litres per 100m ²	Jones (1992)	0 m ²	3	10	0.0
Retail		400.0 litres per 100m ²	Jones (1992)	0 m ²	3	12	0.0
Cinema		10.0 litres per seat	Jones (1992)	0 seats	3	8	0.0
Health Club/Sports Centre		50.0 litres per customer	British Water (2013)	0 customers	3	16	0.0
Day School		90.0 litres per pupil	British Water (2013)	0 pupils	3	10	0.0
Boarding School		175.0 litres per pupil	British Water (2013)	0 pupils	3	24	0.0
Hospital		625.0 litres per bed	Jones (1992)	0 beds	3	24	0.0
Nursing Home		350.0 litres per bed	British Water (2013)	111 beds	3	24	1.3
Restaurant		30.0 litres per cover	British Water (2013)	0 covers	3	8	0.0
Pub/Club		15.0 litres per customer	Butler and Davies (2004)	0 customers	3	12	0.0
Warehouse		150.0 litres per 100m ²	Jones (1992)	0 m ²	3	12	0.0
Manufacturing		550.0 litres per 100m ²	Jones (1992)	0 m ²	3	12	0.0
Commercial		300.0 litres per 100m ²	Jones (1992)	0 m ²	3	12	0.0
SUB TOTAL							2.6
Infiltration percentage	10%						0.3
TOTAL							2.9

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