

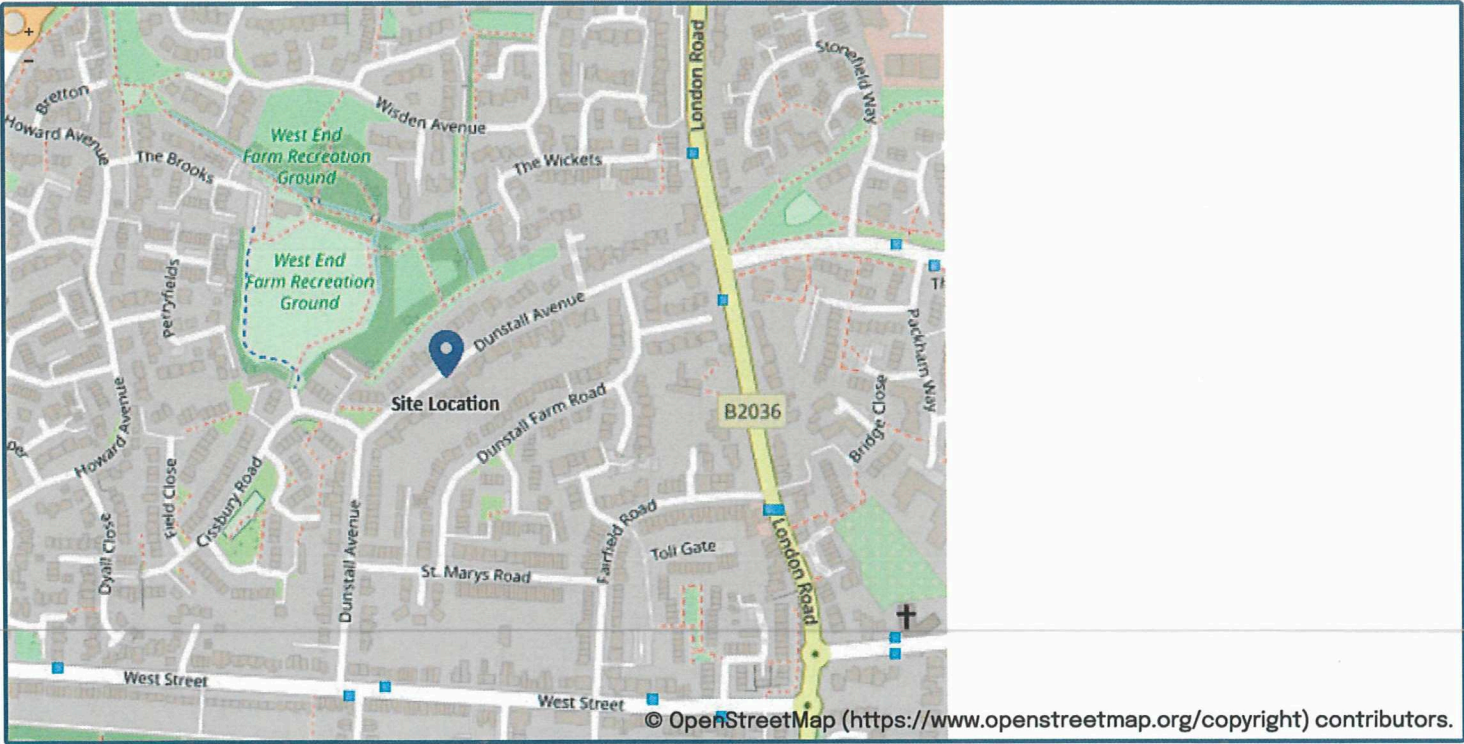
This is an estimation of the greenfield runoff rates that are used to support Environment Agency guidance “Rainfall runoff management for development” (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	05/08/2026
Calculated by	Simon Dent Associates
Reference	26064
Model version	2.2.3

Location

Site name	77 Dunstall Avenue
Site location	Burgess Hill West Sussex



Site easting (British National Grid)	530518
Site northing (British National Grid)	119879

Site details

Total site area (ha)	0.042 ha
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Greenfield runoff

Method

Method

FEH statistical (2008)

FEH statistical (2008)

	My value		Map value
SAAR6190 (mm)	815		mm
BFIHOST19	0.236		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	0.3		l/s
QBar (FEH statistical 2008) (l/s)	0.4		l/s

Growth curve factors

	My value		Map value
Hydrological region	7		7
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	FEH statistical (2008)
Flow rate 1 year (l/s)	0.3 l/s
Flow rate 2 year (l/s)	0.3 l/s
Flow rate 10 years (l/s)	0.6 l/s
Flow rate 30 years (l/s)	0.9 l/s
Flow rate 100 years (l/s)	1.2 l/s
Flow rate 200 years (l/s)	1.4 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Surface water storage volume design tool

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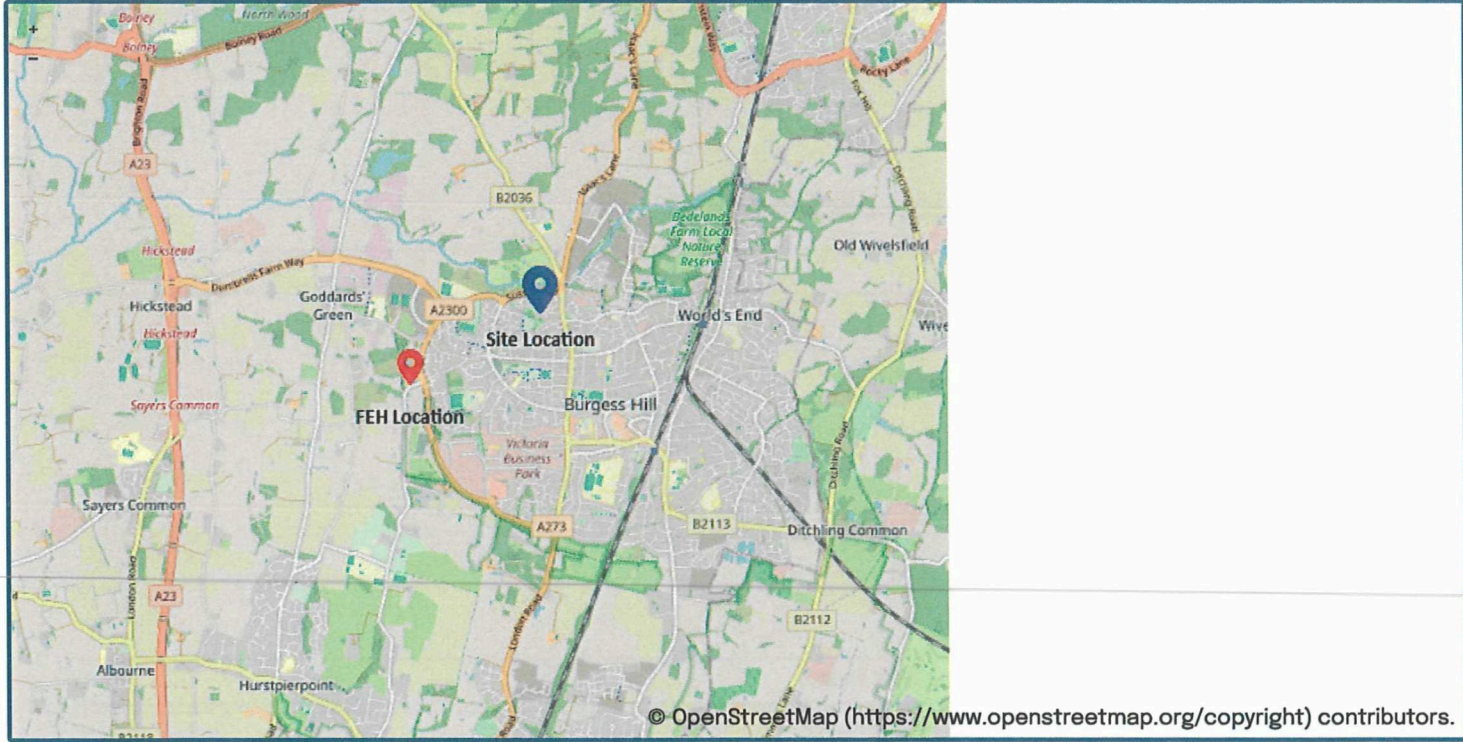
This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is recommended that the total storage volume for the site is distributed across the site using multiple SuDS and that hydraulic modelling software is used to undertake and finalise the detailed design of the drainage system.

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Location

Site name	77 Dunstall Avenue
Site location	Burgess Hill West Sussex



Site easting (British National Grid)	530518
Site northing (British National Grid)	119879

Site areas

Total site area (ha)	0.042	ha
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Roof area

Total roof area (ha)	0.0174	ha
Contributing roof area (ha)	0.0174	ha
Non-contributing roof area (ha)	0	ha

Paved area

Total paved area (ha)	0.0052	ha
Contributing paved area (ha)	0	ha
Non-contributing paved area (ha)	0.0052	ha

Grass / vegetated area

Total grass / vegetated area (ha)	0.0194	ha
Contributing grass / vegetated area (ha)		ha
Non-contributing grass / vegetated area (ha)	0.0194	ha

Total area

Total contributing area (ha)	0.0174	ha
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Contributing areas with urban creep allowance

Urban creep allowance factor	+10%	
Contributing roof area (adjusted for urban creep) (ha)	0.0174	ha
Contributing paved area (adjusted for urban creep) (ha)	0	ha
Contributing grass / vegetated area (adjusted for urban creep) (ha)	0	ha

Storage design parameters

Storage base shape	Rectangular / square	
Storage base length to width ratio	1:1 (square)	
Storage design depth (m)	1	m
Storage side slope (1 in x)	1 in 1	
Storage voids ratio (%)	90% (e.g. geocellular crate systems)	
Storage volume design return period (years)	1:100 years	

Discharge flow rate from the site

Method

Type of site	Greenfield
Specify the method	FEH statistical (2008)

FEH statistical (2008)

	My value		Map/default value
SAAR6190 (mm)	815		mm
3FIHOST19	0.236		
QMed (l/s)	0.3		l/s
QMed-QBar conversion	1.136		1.136
Total area for greenfield runoff calculation (ha)	0.042		ha
QBar (l/s)	0.4		l/s
Hydrological region	7		7
Return period (years)	Qbar (1:2.3 years)		
Growth curve factor	1		

Final discharge rate

Runoff calculation method	FEH statistical (2008)
Design flow rate (l/s)	0.4

Blockage risk

Specify the method	Flow rate
Minimum discharge flow rate to prevent blockage	1l/s
Design orifice diameter (mm)	21
Flow rate of orifice (l/s)	0.92

	My value		Calculated value
Design orifice diameter (mm)	21		mm
Flow rate of orifice (l/s)	0.92		l/s

Rainfall and runoff

Rainfall input type	FEH22 CSV file
	FEH_Point_Rainfall_FEH22_POT_529263_119045.csv
Distance from FEH location to site (km)	1.5
Climate change allowance factor	145%
Specify the runoff method from grass / vegetated areas	Fixed percentage - equal to SPR
How should SPR be derived?	WRAP soil type
WRAP soil type	4
SPR	0.47

Model results

- Maximum discharge flow rate: 0.9 (l/s)
- Outflow orifice diameter: 21 (mm)
- Storage base length: 2.1 (m)
- Storage base width: 2.1 (m)
- Storage base area: 4.5 (m²)
- Storage total volume: 10.0 (m³)
- Storage total water volume: 9.0 (m³)
- Storm return periods run: 1, 2, 10, 30, 100, 200 (years)
- Storm durations run: 15, 30, 60, 120, 180, 240, 360, 540, 720, 900, 1080, 1440, 1800, 2160, 2880, 3600, 4320, 5040, 5760 (minutes)

Return Period (years)	Critical Duration (minutes)	Peak Flow Rate (l/s)	Max Depth (m)	Max water volume (m³)	Max storage volume (m³)
1	180	0.6	0.41	2.4	2.7
2	120	0.6	0.47	2.9	3.2
10	120	0.8	0.70	5.1	5.7
30	120	0.8	0.85	6.9	7.7
<u>100</u>	<u>120</u>	<u>0.9</u>	<u>1.00</u>	<u>9.0</u>	<u>10.0</u>
200	120	1.0	1.09	10	11

Please note runoff estimation and storage volume estimation are subject to uncertainty. Storage volume results are therefore reported to the nearest 1 m³ value, unless storage volumes are less than 10 m³, in which case, storage volumes are provided to 1 decimal place.

Disclaimer

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Appendix A – Rainfall Depths

Rainfall depths (mm) with climate change

Duration (minutes)	Duration (hours)	1 years	2 years	10 years	30 years	100 years	200 years
15	0.25	11.14	13.41	22.74	29.20	36.58	41.02
30	0.5	14.53	17.54	29.97	38.80	49.18	55.53
60	1	18.30	22.10	37.92	49.46	63.00	71.40
120	2	26.22	30.51	48.18	60.96	76.05	85.75
180	3	31.25	35.83	54.66	68.31	84.61	95.34
240	4	34.92	39.72	59.39	73.72	91.12	102.82
360	6	40.08	45.18	66.08	81.43	100.91	114.54
540	9	45.17	50.58	72.75	89.39	111.51	127.74
720	12	48.84	54.46	77.55	95.19	119.52	137.88
900	15	51.78	57.57	81.34	99.72	125.96	146.00
1080	18	54.27	60.19	84.53	103.54	131.46	152.84
1440	24	58.55	64.66	89.91	110.06	140.68	163.94
1800	30	62.31	68.58	94.61	115.65	148.28	172.75
2160	36	65.79	72.21	98.90	120.68	154.85	180.22
2880	48	72.18	78.85	106.68	129.60	165.97	192.56
3600	60	78.24	85.14	113.91	137.58	175.19	202.56
4320	72	84.03	91.13	120.71	144.93	183.40	211.32
5040	84	89.61	96.90	127.21	151.84	190.89	219.25
5760	96	95.05	102.52	133.47	158.44	197.88	226.58

Rainfall depths (mm) without climate change

Duration (minutes)	Duration (hours)	1 years	2 years	10 years	30 years	100 years	200 years
15	0.25	7.68	9.25	15.68	20.14	25.23	28.29
30	0.5	10.02	12.10	20.67	26.76	33.92	38.30
60	1	12.62	15.24	26.15	34.11	43.45	49.24
120	2	18.08	21.04	33.23	42.04	52.45	59.14
180	3	21.55	24.71	37.70	47.11	58.35	65.75
240	4	24.08	27.39	40.96	50.84	62.84	70.91
360	6	27.64	31.16	45.57	56.16	69.59	78.99
540	9	31.15	34.88	50.17	61.65	76.90	88.10
720	12	33.69	37.56	53.48	65.65	82.43	95.09
900	15	35.71	39.70	56.10	68.77	86.87	100.69
1080	18	37.43	41.51	58.30	71.41	90.66	105.41
1440	24	40.38	44.59	62.01	75.90	97.02	113.06
1800	30	42.98	47.30	65.25	79.76	102.26	119.14

Duration (minutes)	Duration (hours)	1 years	2 years	10 years	30 years	100 years	200 years
2160	36	45.38	49.80	68.21	83.23	106.79	124.29
2880	48	49.78	54.38	73.57	89.38	114.46	132.80
3600	60	53.96	58.72	78.56	94.88	120.82	139.70
4320	72	57.95	62.85	83.25	99.95	126.48	145.74
5040	84	61.80	66.83	87.73	104.72	131.65	151.21
5760	96	65.55	70.70	92.05	109.27	136.47	156.26

Date: Aug-26

Fitting description	K value
Entrance Losses	
Sharp	0.50
Re-entered	0.80
Rounded	0.25
Bellmouth	0.20
Footvalve and strainer	2.50
Bends	
11 ¼ ° short radius	0.10
22 ½ °	0.15
45°	0.30
90°	0.75
Tees	
45° branch	0.50
90° branch	1.30
Exit Losses	
Sudden enlargement	1.00
Bellmouth outlet	0.20
Angle branch	
Inline flow	0.35
45°	0.60
90°	0.80
Tapers	
Flow to small end	0.00
Flow to large end	0.00
Inlet:outlet diam ratio	
4 - 5 RATIO	0.03
3 - 4 RATIO	0.04
1 - 2 RATIO	0.12
Valves	
Gate valve (GV) – full open	0.15
GV – 25% closed	1.00
GV – 50% closed	6.00
GV – 75% closed	24.00
Globe valve	10.00
Right Angle valve	5.00
Reflux valve	1.00

$$f = \frac{0.25}{\left[\log \left(\frac{\varepsilon/D}{3.7} + \frac{5.74}{\text{Re}^{0.9}} \right) \right]^2}$$

SIMON DENT ASSOCIATES



Project Title:

77 Dunstall Avenue

Job no: 26064

Pumping Main Pipe and Fitting Losses

Date: Aug-26

							Fitting description	K value	
Internal pipe dia (mm)	50	Pipe Fitting Losses	Type	nr	K Value	Total Loss (k)	Entrance Losses		
			Entrance Losses	Footvalve and strainer	1	2.50	2.5	Sharp	0.50
Total pipe Length (m)	23		Bends	90°	2	0.75	1.5	Re-entered	0.80
			Tees	90° branch	1	1.30	1.3	Rounded	0.25
Lowest Water level (mAOD)	26.040		Exit Losses	Sudden enlargement	1	1.00	1	Bellmouth	0.20
			Angle branch	Inline flow	0	0.35	0	Footvalve and strainer	2.50
Discharge level (mAOD)	28.650		Tapers	Flow to large end	1	0.00	0	Bends	
			Inlet:outlet diam ratio	3 - 4 RATIO	1	0.04	0.04	11 ¼ ° short radius	0.10
Static Head (m)	2.61		Valves	Gate valve (GV) – full open	1	0.15	0.15	22 ½ °	0.15
			Valves	Reflux valve	1	1.00	1	45°	0.30
Design flow (lit/sec):	2.50	TOTAL K LOSSES					6.49	90°	0.75
Design velocity (m/s):	1.27	Loss in pipe (m) Using Darcy-Weisbach					0.27	Tees	
Effluent temp (deg C):	10	Loss in head from fittings (m)					0.54	45° branch	0.50
		Total working head to overcome (m)					3.42	90° branch	1.30
Dynamic Viscosity (kg.m/s²):	0.001308							Exit Losses	
								Sudden enlargement	1.00
Water Density (kg/m):	999.7							Bellmouth outlet	0.20
Kinematic Viscosity (m²/s):	0.00000131							Angle branch	
								Inline flow	0.35
Reynolds Number, Re:	48.7E+6							45°	0.60
								90°	0.80
Pipe Material:	PP							Tapers	
								Flow to small end	0.00
Pipe roughness (mm):	0.00150							Flow to large end	0.00
Friction f (Swamee-Jain):	0.007223							Inlet:outlet diam ratio	
								4 - 5 RATIO	0.03
								3 - 4 RATIO	0.04
								1 - 2 RATIO	0.12
								Valves	
								Gate valve (GV) – full open	0.15
								GV – 25% closed	1.00
								GV – 50% closed	6.00
								GV – 75% closed	24.00
								Globe valve	10.00
								Right Angle valve	5.00
								Reflux valve	1.00

$$f = \frac{0.25}{\left[\log\left(\frac{\varepsilon/D}{3.7} + \frac{5.74}{Re^{0.9}}\right)\right]^2}$$

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