

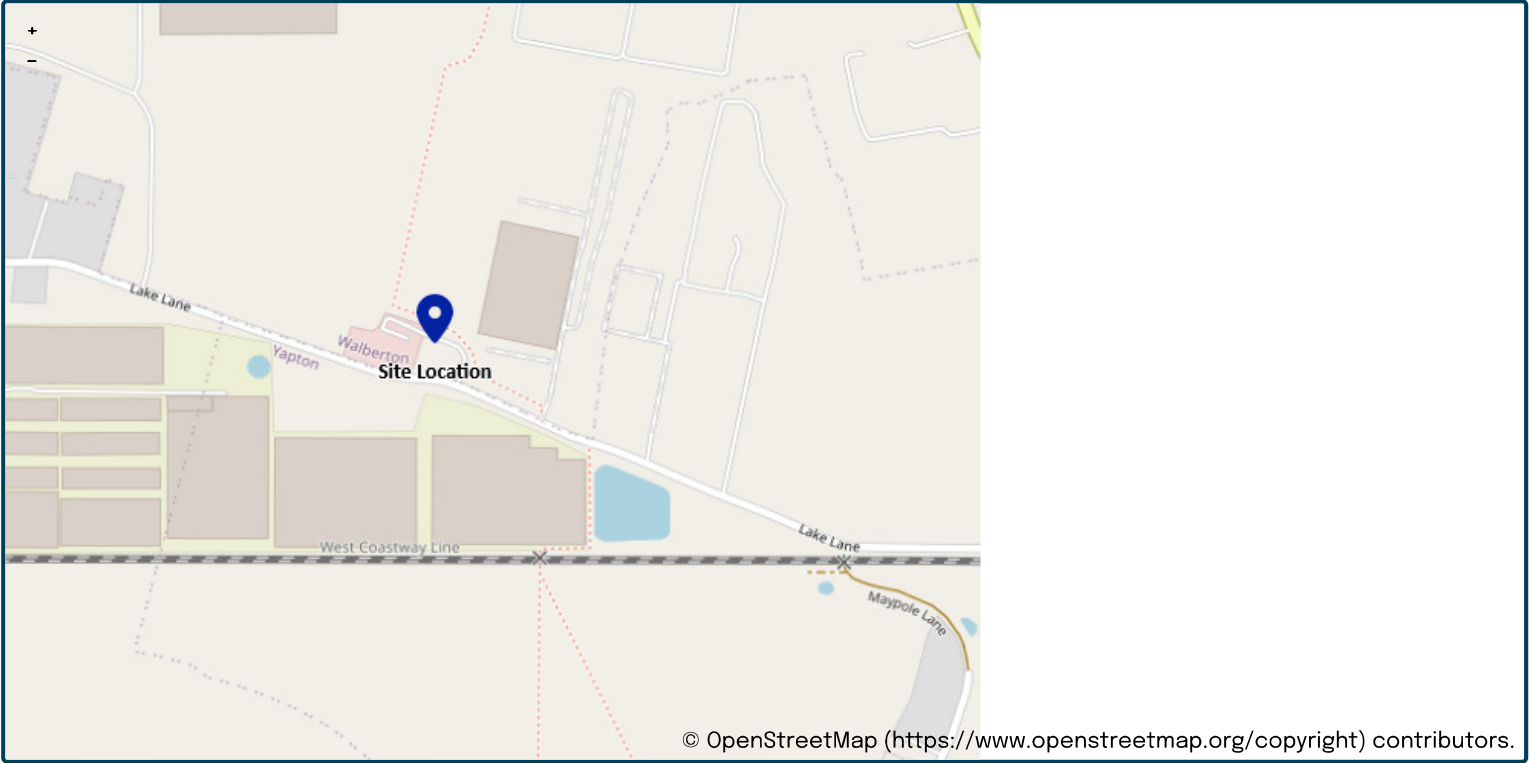
This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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.

Project details

Date	<input type="text" value="25/06/2025"/>
Calculated by	<input type="text" value="Simon Dent Associates"/>
Reference	<input type="text" value="1859 - Sussex Business Centre Barnham"/>
Model version	<input type="text" value="2.0.1"/>

Location

Site name	<input type="text" value="SBC - Barnham"/>
Site location	<input type="text" value="Barnham"/>



Site easting	<input type="text" value="497300"/>
Site northing	<input type="text" value="104577"/>

Site areas

Total site area (ha)	<div><div>.1405</div><div>ha</div></div>
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Roof area

Total roof area (ha)	<div><div>.0263</div><div>ha</div></div>
Contributing roof area (ha)	<div><div>.0263</div><div>ha</div></div>
Non-contributing roof area (ha)	<div><div>0</div><div>ha</div></div>

Paved area

Total paved area (ha)	<div><div>.0281</div><div>ha</div></div>
Contributing paved area (ha)	<div><div>.0281</div><div>ha</div></div>
Non-contributing paved area (ha)	<div><div>0</div><div>ha</div></div>

Grass / vegetated area

Total grass / vegetated area (ha)	<div><div>.0861</div><div>ha</div></div>
Contributing grass / vegetated area (ha)	<div><div>.0861</div><div>ha</div></div>
Non-contributing grass / vegetated area (ha)	<div><div>0</div><div>ha</div></div>

Total area

Total contributing area (ha)	<div><div>0.1405</div><div>ha</div></div>
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Contributing areas with urban creep allowance

Urban creep allowance factor	<div><div>+10%</div></div>
Contributing roof area (adjusted for urban creep) (ha)	<div><div>0.02893</div><div>ha</div></div>
Contributing paved area (adjusted for urban creep) (ha)	<div><div>0.03091</div><div>ha</div></div>
Contributing grass / vegetated area (adjusted for urban creep) (ha)	<div><div>0.08066</div><div>ha</div></div>

Storage design parameters

Storage base shape	<div><div>Rectangular / square</div></div>
Storage base length to width ratio	<div><div>1:1 (square)</div></div>
Storage design depth (mm)	<div><div>500</div><div>mm</div></div>
Storage side slope (1 in x)	<div><div>1 in 1</div></div>
Storage voids ratio (%)	<div><div>90% (e.g. geocellular crate systems)</div></div>
Storage volume design return period (years)	<div><div>1:100 years</div></div>

Discharge flow rate from the site

Method

Type of site

Greenfield

Specify the method

User specified

User specified discharge

Flow rate (user specified) (l/s)

.7

l/s

Final discharge rate

Runoff calculation method

User specified

Design flow rate (l/s)

0.7

l/s

Blockage risk

Specify the method

Orifice diameter

Minimum orifice diameter to prevent blockage (mm)

21

mm

My value

Calculated value

Design orifice diameter (mm)

21

mm

21

Flow rate of orifice (l/s)

0.65

l/s

Rainfall and runoff

Rainfall input type

FEH22 CSV file

FEH_Point_Rainfall_FEH22_POT_514534_103783.csv

Distance from FEH location to site (km)

17.3

km

Climate change allowance factor

145%

Specify the runoff method from grass / vegetated areas

Fixed percentage - based on rainfall event depth and SPR

My value

Map value

How should SPR be derived?

WRAP soil type

WRAP soil type

2

2

SPR

0.3

Model results

- Maximum discharge flow rate: 0.64 (l/s)
- Outflow orifice diameter: 21 (mm)
- Storage base length: 13.76 (m)
- Storage base width: 13.76 (m)
- Storage base area: 189.24 (m²)
- Storage total volume: 101.4 (m³)
- Storage total water volume: 91.3 (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 (minutes)

Return Period (years)	Critical Duration (minutes)	Peak Flow Rate (l/s)	Max Depth (m)	Max water volume (m ³)	Max storage volume (m ³)
1	1080	0.35	0.15	26.6	29.6
2	900	0.4	0.2	34.5	38.3
10	900	0.5	0.31	54.3	60.3
30	900	0.57	0.39	69.9	77.7
<u>100</u>	<u>900</u>	<u>0.64</u>	<u>0.5</u>	<u>91.3</u>	<u>101.4</u>
200	1080	0.7	0.58	107.6	119.6

Disclaimer

This report was produced using the surface water storage volume design tool (2.0.1) developed by HR Wallingford and available at [uksuds.com](https://www.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 surface water storage volumes for the whole site based on a limiting discharge rate from the site. 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.

HR Wallingford are not responsible for any rainfall data shared that is subject to licensing terms imposed by UK Centre for Ecology & Hydrology's Flood Estimation Handbook web service (<https://fehweb.ceh.ac.uk/Home/Terms> (<https://fehweb.ceh.ac.uk/Home/Terms>)).

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	9.67	13.83	24.17	31.26	39.22	44.07
30	0.5	12.57	18.11	31.81	41.66	52.74	59.61
60	1	15.92	22.85	40.34	53.16	67.83	76.76
120	2	23.4	31.48	51.3	65.48	81.95	92.1
180	3	27.97	36.7	57.8	72.82	90.51	101.72
240	4	31.16	40.34	62.28	77.94	96.64	108.75
360	6	35.41	45.14	68.22	84.81	105.21	118.77
540	9	39.54	49.65	73.79	91.36	113.87	129.15
720	12	42.44	52.84	77.66	95.93	119.86	136.52
900	15	44.69	55.39	80.68	99.46	124.22	142.07
1080	18	46.59	57.54	83.19	102.36	127.8	146.49
1440	24	49.98	61.06	87.43	107.14	133.78	153.03
1800	30	52.94	64.28	91.23	111.43	138.79	158.57
2160	36	55.68	67.31	94.76	115.38	143.26	163.49
2880	48	60.75	72.95	101.27	122.61	151.18	172.1

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	6.67	9.54	16.67	21.56	27.05	30.39
30	0.5	8.67	12.49	21.94	28.73	36.37	41.11
60	1	10.98	15.76	27.82	36.66	46.78	52.94
120	2	16.14	21.71	35.38	45.16	56.52	63.52
180	3	19.29	25.31	39.86	50.22	62.42	70.15
240	4	21.49	27.82	42.95	53.75	66.65	75
360	6	24.42	31.13	47.05	58.49	72.56	81.91
540	9	27.27	34.24	50.89	63.01	78.53	89.07
720	12	29.27	36.44	53.56	66.16	82.66	94.15
900	15	30.82	38.2	55.64	68.59	85.67	97.98
1080	18	32.13	39.68	57.37	70.59	88.14	101.03
1440	24	34.47	42.11	60.3	73.89	92.26	105.54
1800	30	36.51	44.33	62.92	76.85	95.72	109.36
2160	36	38.4	46.42	65.35	79.57	98.8	112.75
2880	48	41.9	50.31	69.84	84.56	104.26	118.69