

Calculated by:

Site name:

Site location:

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 not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:

Longitude:

Reference:

Date:

Site characteristics

Total site area (ha):

Significant public open space (ha):

Area positively drained (ha):

Impermeable area (ha):

Percentage of drained area that is impermeable (%):

Impervious area drained via infiltration (ha):

Return period for infiltration system design (year):

Impervious area drained to rainwater harvesting (ha):

Return period for rainwater harvesting system (year):

Compliance factor for rainwater harvesting system (%):

Net site area for storage volume design (ha):

Net impermeable area for storage volume design (ha):

Pervious area contribution to runoff (%):

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:

Urban creep allowance factor:

Volume control approach:

Interception rainfall depth (mm):

Minimum flow rate (l/s):

Methodology

Q_{MED} estimation method:

BFI and SPR method:

Soil characteristics:

HOST class:

BFI HOST:

SPR HOST:

Hydrological characteristics

	Default	Edited
Q_{MED} :	--	0.93
Q_{BAR} / Q_{MED} conversion factor:	--	1.075
Rainfall 100 yrs 6 hrs:	--	63
Rainfall 100 yrs 12 hrs:	--	78.54
FEH / FSR conversion factor:	1.02	1.02
SAAR (mm):	722	722
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.4	0.4
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 10 year:	1.38	1.38
Growth curve factor 30 year:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Q_{BAR} for total site area (l/s):	1	1
Q_{BAR} for net site area (l/s):	1	1

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):	94	94
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):	0	0
1 in 100 year (l/s):	2.1	2.1	Total storage 1/100 years (m³):	94	94

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Site Details

Latitude:

Longitude:

Reference:

Date:

Site characteristics

Total site area (ha):	<input type="text" value="0.1050"/>
Significant public open space (ha):	<input type="text" value="0"/>
Area positively drained (ha):	<input type="text" value="0.105"/>
Impermeable area (ha):	<input type="text" value="0.105"/>
Percentage of drained area that is impermeable (%):	<input type="text" value="100"/>
Impervious area drained via infiltration (ha):	<input type="text" value="0"/>
Return period for infiltration system design (year):	<input type="text" value="10"/>
Impervious area drained to rainwater harvesting (ha):	<input type="text" value="0"/>
Return period for rainwater harvesting system (year):	<input type="text" value="10"/>
Compliance factor for rainwater harvesting system (%):	<input type="text" value="66"/>
Net site area for storage volume design (ha):	<input type="text" value="0.11"/>
Net impermeable area for storage volume design (ha):	<input type="text" value="0.11"/>
Pervious area contribution to runoff (%):	<input type="text" value="30"/>

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	<input type="text" value="1.4"/>
Urban creep allowance factor:	<input type="text" value="1"/>
Volume control approach	<input type="text" value="Use long term storage"/>
Interception rainfall depth (mm):	<input type="text" value="5"/>
Minimum flow rate (l/s):	<input type="text" value="2"/>

Methodology

Q_{MED} estimation method:

BFI and SPR method:

Soil characteristics

HOST class:	<input type="text" value="--"/>	<input type="text" value="--"/>
BFI HOST:	<input type="text" value="--"/>	<input type="text" value="0.492"/>
SPR HOST:	<input type="text" value="--"/>	<input type="text" value="0.47"/>

Hydrological characteristics

Q_{MED} :	<input type="text" value="--"/>	<input type="text" value="0.31"/>
Q_{BAR} / Q_{MED} conversion factor:	<input type="text" value="--"/>	<input type="text" value="1.075"/>
Rainfall 100 yrs 6 hrs:	<input type="text" value="--"/>	<input type="text" value="55"/>
Rainfall 100 yrs 12 hrs:	<input type="text" value="--"/>	<input type="text" value="65.52"/>
FEH / FSR conversion factor:	<input type="text" value="1.04"/>	<input type="text" value="1.04"/>
SAAR (mm):	<input type="text" value="698"/>	<input type="text" value="698"/>
M5-60 Rainfall Depth (mm):	<input type="text" value="17"/>	<input type="text" value="17"/>
'r' Ratio M5-60/M5-2 day:	<input type="text" value="0.4"/>	<input type="text" value="0.4"/>
Hydrological region:	<input type="text" value="10"/>	<input type="text" value="10"/>
Growth curve factor 1 year:	<input type="text" value="0.87"/>	<input type="text" value="0.87"/>
Growth curve factor 10 year:	<input type="text" value="1.38"/>	<input type="text" value="1.38"/>
Growth curve factor 30 year:	<input type="text" value="1.7"/>	<input type="text" value="1.7"/>
Growth curve factor 100 years:	<input type="text" value="2.08"/>	<input type="text" value="2.08"/>
Q_{BAR} for total site area (l/s):	<input type="text" value="0.34"/>	<input type="text" value="0.34"/>
Q_{BAR} for net site area (l/s):	<input type="text" value="0.34"/>	<input type="text" value="0.34"/>

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):	36	36
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):	0	0
1 in 100 year (l/s):	2	2	Total storage 1/100 years (m³):	36	36

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Site Details

Latitude:

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Reference:

Date:

Site characteristics

Total site area (ha):	<input type="text" value="0.1050"/>
Significant public open space (ha):	<input type="text" value="0"/>
Area positively drained (ha):	<input type="text" value="0.105"/>
Impermeable area (ha):	<input type="text" value="0.1050"/>
Percentage of drained area that is impermeable (%):	<input type="text" value="100"/>
Impervious area drained via infiltration (ha):	<input type="text" value="0"/>
Return period for infiltration system design (year):	<input type="text" value="10"/>
Impervious area drained to rainwater harvesting (ha):	<input type="text" value="0"/>
Return period for rainwater harvesting system (year):	<input type="text" value="10"/>
Compliance factor for rainwater harvesting system (%):	<input type="text" value="66"/>
Net site area for storage volume design (ha):	<input type="text" value="0.11"/>
Net impermeable area for storage volume design (ha):	<input type="text" value="0.11"/>
Pervious area contribution to runoff (%):	<input type="text" value="30"/>

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	<input type="text" value="1.4"/>
Urban creep allowance factor:	<input type="text" value="1"/>
Volume control approach	<input type="text" value="Use long term storage"/>
Interception rainfall depth (mm):	<input type="text" value="5"/>
Minimum flow rate (l/s):	<input type="text" value="2"/>

Methodology

Q_{MED} estimation method:

BFI and SPR method:

Soil characteristics

HOST class:	<input type="text" value="--"/>	<input type="text" value="--"/>
BFI HOST:	<input type="text" value="--"/>	<input type="text" value="0.682"/>
SPR HOST:	<input type="text" value="--"/>	<input type="text" value="0.3"/>

Hydrological characteristics

Q_{MED} :	<input type="text" value="--"/>	<input type="text" value="0.16"/>
Q_{BAR} / Q_{MED} conversion factor:	<input type="text" value="--"/>	<input type="text" value="1.075"/>
Rainfall 100 yrs 6 hrs:	<input type="text" value="--"/>	<input type="text" value="55"/>
Rainfall 100 yrs 12 hrs:	<input type="text" value="--"/>	<input type="text" value="65.52"/>
FEH / FSR conversion factor:	<input type="text" value="1.04"/>	<input type="text" value="1.04"/>
SAAR (mm):	<input type="text" value="699"/>	<input type="text" value="699"/>
M5-60 Rainfall Depth (mm):	<input type="text" value="17"/>	<input type="text" value="17"/>
'r' Ratio M5-60/M5-2 day:	<input type="text" value="0.4"/>	<input type="text" value="0.4"/>
Hydrological region:	<input type="text" value="9"/>	<input type="text" value="9"/>
Growth curve factor 1 year:	<input type="text" value="0.88"/>	<input type="text" value="0.88"/>
Growth curve factor 10 year:	<input type="text" value="1.42"/>	<input type="text" value="1.42"/>
Growth curve factor 30 year:	<input type="text" value="1.78"/>	<input type="text" value="1.78"/>
Growth curve factor 100 years:	<input type="text" value="2.18"/>	<input type="text" value="2.18"/>
Q_{BAR} for total site area (l/s):	<input type="text" value="0.17"/>	<input type="text" value="0.17"/>
Q_{BAR} for net site area (l/s):	<input type="text" value="0.17"/>	<input type="text" value="0.17"/>

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):	36	36
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):	0	0
1 in 100 year (l/s):	2	2	Total storage 1/100 years (m³):	36	36

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Site Details

Latitude:

Longitude:

Reference:

Date:

Site characteristics

Total site area (ha):	<input type="text" value="0.1050"/>
Significant public open space (ha):	<input type="text" value="0"/>
Area positively drained (ha):	<input type="text" value="0.105"/>
Impermeable area (ha):	<input type="text" value="0.1050"/>
Percentage of drained area that is impermeable (%):	<input type="text" value="100"/>
Impervious area drained via infiltration (ha):	<input type="text" value="0"/>
Return period for infiltration system design (year):	<input type="text" value="10"/>
Impervious area drained to rainwater harvesting (ha):	<input type="text" value="0"/>
Return period for rainwater harvesting system (year):	<input type="text" value="10"/>
Compliance factor for rainwater harvesting system (%):	<input type="text" value="66"/>
Net site area for storage volume design (ha):	<input type="text" value="0.11"/>
Net impermeable area for storage volume design (ha):	<input type="text" value="0.11"/>
Pervious area contribution to runoff (%):	<input type="text" value="30"/>

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	<input type="text" value="1.4"/>
Urban creep allowance factor:	<input type="text" value="1"/>
Volume control approach	<input type="text" value="Use long term storage"/>
Interception rainfall depth (mm):	<input type="text" value="5"/>
Minimum flow rate (l/s):	<input type="text" value="2"/>

Methodology

Q_{MED} estimation method:

BFI and SPR method:

Soil characteristics

HOST class:	<input type="text" value="--"/>	<input type="text" value="--"/>
BFI HOST:	<input type="text" value="--"/>	<input type="text" value="0.492"/>
SPR HOST:	<input type="text" value="--"/>	<input type="text" value="0.47"/>

Hydrological characteristics

Q_{MED} :	<input type="text" value="--"/>	<input type="text" value="0.34"/>
Q_{BAR} / Q_{MED} conversion factor:	<input type="text" value="--"/>	<input type="text" value="1.075"/>
Rainfall 100 yrs 6 hrs:	<input type="text" value="--"/>	<input type="text" value="61"/>
Rainfall 100 yrs 12 hrs:	<input type="text" value="--"/>	<input type="text" value="75.92"/>
FEH / FSR conversion factor:	<input type="text" value="1.04"/>	<input type="text" value="1.04"/>
SAAR (mm):	<input type="text" value="719"/>	<input type="text" value="719"/>
M5-60 Rainfall Depth (mm):	<input type="text" value="17"/>	<input type="text" value="17"/>
'r' Ratio M5-60/M5-2 day:	<input type="text" value="0.3"/>	<input type="text" value="0.3"/>
Hydrological region:	<input type="text" value="9"/>	<input type="text" value="9"/>
Growth curve factor 1 year:	<input type="text" value="0.88"/>	<input type="text" value="0.88"/>
Growth curve factor 10 year:	<input type="text" value="1.42"/>	<input type="text" value="1.42"/>
Growth curve factor 30 year:	<input type="text" value="1.78"/>	<input type="text" value="1.78"/>
Growth curve factor 100 years:	<input type="text" value="2.18"/>	<input type="text" value="2.18"/>
Q_{BAR} for total site area (l/s):	<input type="text" value="0.36"/>	<input type="text" value="0.36"/>
Q_{BAR} for net site area (l/s):	<input type="text" value="0.36"/>	<input type="text" value="0.36"/>

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):	39	39
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):	0	0
1 in 100 year (l/s):	2	2	Total storage 1/100 years (m³):	39	39

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Site Details

Latitude:

Longitude:

Reference:

Date:

Site characteristics

Total site area (ha):	<input type="text" value="0.115"/>
Significant public open space (ha):	<input type="text" value="0"/>
Area positively drained (ha):	<input type="text" value="0.115"/>
Impermeable area (ha):	<input type="text" value="0.115"/>
Percentage of drained area that is impermeable (%):	<input type="text" value="100"/>
Impervious area drained via infiltration (ha):	<input type="text" value="0"/>
Return period for infiltration system design (year):	<input type="text" value="10"/>
Impervious area drained to rainwater harvesting (ha):	<input type="text" value="0"/>
Return period for rainwater harvesting system (year):	<input type="text" value="10"/>
Compliance factor for rainwater harvesting system (%):	<input type="text" value="66"/>
Net site area for storage volume design (ha):	<input type="text" value="0.12"/>
Net impermeable area for storage volume design (ha):	<input type="text" value="0.12"/>
Pervious area contribution to runoff (%):	<input type="text" value="30"/>

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	<input type="text" value="1.4"/>
Urban creep allowance factor:	<input type="text" value="1"/>
Volume control approach	<input type="text" value="Use long term storage"/>
Interception rainfall depth (mm):	<input type="text" value="5"/>
Minimum flow rate (l/s):	<input type="text" value="2"/>

Methodology

Q_{MED} estimation method:

BFI and SPR method:

Soil characteristics


HOST class:	<input type="text" value="--"/>	<input type="text" value="--"/>
BFI HOST:	<input type="text" value="--"/>	<input type="text" value="0.492"/>
SPR HOST:	<input type="text" value="--"/>	<input type="text" value="0.47"/>


Hydrological characteristics


Q_{MED} :	<input type="text" value="--"/>	<input type="text" value="0.46"/>
Q_{BAR} / Q_{MED} conversion factor:	<input type="text" value="--"/>	<input type="text" value="1.075"/>
Rainfall 100 yrs 6 hrs:	<input type="text" value="--"/>	<input type="text" value="61"/>
Rainfall 100 yrs 12 hrs:	<input type="text" value="--"/>	<input type="text" value="77.38"/>
FEH / FSR conversion factor:	<input type="text" value="1.06"/>	<input type="text" value="1.06"/>
SAAR (mm):	<input type="text" value="787"/>	<input type="text" value="787"/>
M5-60 Rainfall Depth (mm):	<input type="text" value="17"/>	<input type="text" value="17"/>
'r' Ratio M5-60/M5-2 day:	<input type="text" value="0.3"/>	<input type="text" value="0.3"/>
Hydrological region:	<input type="text" value="9"/>	<input type="text" value="9"/>
Growth curve factor 1 year:	<input type="text" value="0.88"/>	<input type="text" value="0.88"/>
Growth curve factor 10 year:	<input type="text" value="1.42"/>	<input type="text" value="1.42"/>
Growth curve factor 30 year:	<input type="text" value="1.78"/>	<input type="text" value="1.78"/>
Growth curve factor 100 years:	<input type="text" value="2.18"/>	<input type="text" value="2.18"/>
Q_{BAR} for total site area (l/s):	<input type="text" value="0.5"/>	<input type="text" value="0.5"/>
Q_{BAR} for net site area (l/s):	<input type="text" value="0.5"/>	<input type="text" value="0.5"/>


Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):	47	47
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):	0	0
1 in 100 year (l/s):	2	2	Total storage 1/100 years (m³):	47	47

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WSP Group Ltd					Page 1
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Date 24/06/2022		Designed by MA			
File Flint storage.SRCX		Checked by AS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (1/s)	Max Volume (m³)	Status
15 min Summer	51.327	0.197	2.0	201.6	O K
30 min Summer	51.390	0.260	2.0	269.9	Flood Risk
60 min Summer	51.458	0.328	2.0	346.3	Flood Risk
120 min Summer	51.513	0.383	2.0	408.6	Flood Risk
180 min Summer	51.544	0.414	2.0	444.7	Flood Risk
240 min Summer	51.564	0.434	2.0	469.1	Flood Risk
360 min Summer	51.590	0.460	2.0	500.1	Flood Risk
480 min Summer	51.605	0.475	2.0	517.9	Flood Risk
600 min Summer	51.614	0.484	2.0	528.5	Flood Risk
720 min Summer	51.619	0.489	2.0	534.4	Flood Risk
960 min Summer	51.621	0.491	2.0	537.4	Flood Risk
1440 min Summer	51.611	0.481	2.0	524.6	Flood Risk
2160 min Summer	51.577	0.447	2.0	483.8	Flood Risk
2880 min Summer	51.548	0.418	2.0	449.2	Flood Risk
4320 min Summer	51.507	0.377	2.0	402.1	Flood Risk
5760 min Summer	51.479	0.349	2.0	369.8	Flood Risk
7200 min Summer	51.462	0.332	2.0	351.1	Flood Risk
8640 min Summer	51.452	0.322	2.0	339.5	Flood Risk
10080 min Summer	51.448	0.318	2.0	334.3	Flood Risk
15 min Winter	51.327	0.197	2.0	201.6	O K
30 min Winter	51.390	0.260	2.0	270.0	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	154.086	0.0	168.8	27	
30 min Summer	103.378	0.0	163.6	42	
60 min Summer	66.653	0.0	320.7	72	
120 min Summer	39.817	0.0	309.9	130	
180 min Summer	29.225	0.0	305.6	190	
240 min Summer	23.384	0.0	303.6	250	
360 min Summer	16.986	0.0	302.8	370	
480 min Summer	13.480	0.0	303.7	488	
600 min Summer	11.238	0.0	305.4	608	
720 min Summer	9.671	0.0	307.4	728	
960 min Summer	7.608	0.0	311.4	966	
1440 min Summer	5.395	0.0	316.2	1444	
2160 min Summer	3.796	0.0	629.7	2144	
2880 min Summer	2.958	0.0	617.0	2452	
4320 min Summer	2.087	0.0	576.3	3168	
5760 min Summer	1.645	0.0	838.8	3984	
7200 min Summer	1.395	0.0	888.9	4832	
8640 min Summer	1.236	0.0	945.1	5704	
10080 min Summer	1.128	0.0	1006.6	6552	
15 min Winter	154.086	0.0	168.8	27	
30 min Winter	103.378	0.0	163.6	41	
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Date 24/06/2022		Designed by MA			
File Flint storage.SRCX		Checked by AS			
XP Solutions		Source Control 2019.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	51.458	0.328	2.0	346.4	Flood Risk
120 min Winter	51.513	0.383	2.0	408.9	Flood Risk
180 min Winter	51.544	0.414	2.0	445.2	Flood Risk
240 min Winter	51.565	0.435	2.0	469.8	Flood Risk
360 min Winter	51.591	0.461	2.0	501.2	Flood Risk
480 min Winter	51.607	0.477	2.0	519.4	Flood Risk
600 min Winter	51.616	0.486	2.0	530.4	Flood Risk
720 min Winter	51.621	0.491	2.0	536.7	Flood Risk
960 min Winter	51.624	0.494	2.0	540.5	Flood Risk
1440 min Winter	51.615	0.485	2.0	530.1	Flood Risk
2160 min Winter	51.585	0.455	2.0	493.8	Flood Risk
2880 min Winter	51.551	0.421	2.0	452.9	Flood Risk
4320 min Winter	51.502	0.372	2.0	396.4	Flood Risk
5760 min Winter	51.462	0.332	2.0	351.0	Flood Risk
7200 min Winter	51.432	0.302	2.0	316.8	Flood Risk
8640 min Winter	51.406	0.276	2.0	288.3	Flood Risk
10080 min Winter	51.388	0.258	2.0	268.5	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	66.653	0.0	320.7	70	
120 min Winter	39.817	0.0	309.7	128	
180 min Winter	29.225	0.0	305.3	188	
240 min Winter	23.384	0.0	303.2	246	
360 min Winter	16.986	0.0	302.2	364	
480 min Winter	13.480	0.0	302.9	480	
600 min Winter	11.238	0.0	304.4	598	
720 min Winter	9.671	0.0	306.3	714	
960 min Winter	7.608	0.0	309.9	946	
1440 min Winter	5.395	0.0	313.3	1404	
2160 min Winter	3.796	0.0	624.0	2064	
2880 min Winter	2.958	0.0	616.3	2680	
4320 min Winter	2.087	0.0	580.8	3328	
5760 min Winter	1.645	0.0	838.8	4264	
7200 min Winter	1.395	0.0	888.8	5192	
8640 min Winter	1.236	0.0	944.7	6048	
10080 min Winter	1.128	0.0	1007.0	6864	
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Calculated by:

Site name:

Site location:

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 not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:

Longitude:

Reference:

Date:

Site characteristics

Total site area (ha):

Significant public open space (ha):

Area positively drained (ha):

Impermeable area (ha):

Percentage of drained area that is impermeable (%):

Impervious area drained via infiltration (ha):

Return period for infiltration system design (year):

Impervious area drained to rainwater harvesting (ha):

Return period for rainwater harvesting system (year):

Compliance factor for rainwater harvesting system (%):

Net site area for storage volume design (ha):

Net impermeable area for storage volume design (ha):

Pervious area contribution to runoff (%):

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:

Urban creep allowance factor:

Volume control approach:

Interception rainfall depth (mm):

Minimum flow rate (l/s):

Methodology

Q_{MED} estimation method:

BFI and SPR method:

Soil characteristics:

HOST class:

BFI HOST:

SPR HOST:

Hydrological characteristics

Q_{MED} :

Q_{BAR} / Q_{MED} conversion factor:

Rainfall 100 yrs 6 hrs:

Rainfall 100 yrs 12 hrs:

FEH / FSR conversion factor:

SAAR (mm):

M5-60 Rainfall Depth (mm):

'r' Ratio M5-60/M5-2 day:

Hydrological region:

Growth curve factor 1 year:

Growth curve factor 10 year:

Growth curve factor 30 year:

Growth curve factor 100 years:

Q_{BAR} for total site area (l/s):

Q_{BAR} for net site area (l/s):

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):	40	40
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):	0	0
1 in 100 year (l/s):	2	2	Total storage 1/100 years (m³):	40	40

This report was produced using the storage estimation tool developed by HRWallingford and available at 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 <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. 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, CEH, Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Calculated by:

Site name:

Site location:

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Site Details

Latitude:

Longitude:

Reference:

Date:

Site characteristics

Total site area (ha):	<input type="text" value="0.105"/>
Significant public open space (ha):	<input type="text" value="0"/>
Area positively drained (ha):	<input type="text" value="0.105"/>
Impermeable area (ha):	<input type="text" value="0.105"/>
Percentage of drained area that is impermeable (%):	<input type="text" value="100"/>
Impervious area drained via infiltration (ha):	<input type="text" value="0"/>
Return period for infiltration system design (year):	<input type="text" value="10"/>
Impervious area drained to rainwater harvesting (ha):	<input type="text" value="0"/>
Return period for rainwater harvesting system (year):	<input type="text" value="10"/>
Compliance factor for rainwater harvesting system (%):	<input type="text" value="66"/>
Net site area for storage volume design (ha):	<input type="text" value="0.11"/>
Net impermeable area for storage volume design (ha):	<input type="text" value="0.11"/>
Pervious area contribution to runoff (%):	<input type="text" value="30"/>

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	<input type="text" value="1.4"/>
Urban creep allowance factor:	<input type="text" value="1"/>
Volume control approach	<input type="text" value="Use long term storage"/>
Interception rainfall depth (mm):	<input type="text" value="5"/>
Minimum flow rate (l/s):	<input type="text" value="2"/>

Methodology

Q_{MED} estimation method:

BFI and SPR method:

Soil characteristics

HOST class:	<input type="text" value="--"/>	<input type="text" value="--"/>
BFI HOST:	<input type="text" value="--"/>	<input type="text" value="0.682"/>
SPR HOST:	<input type="text" value="--"/>	<input type="text" value="0.21"/>

Hydrological characteristics

Q_{MED} :	<input type="text" value="--"/>	<input type="text" value="0.27"/>
Q_{BAR} / Q_{MED} conversion factor:	<input type="text" value="--"/>	<input type="text" value="1.075"/>
Rainfall 100 yrs 6 hrs:	<input type="text" value="--"/>	<input type="text" value="61"/>
Rainfall 100 yrs 12 hrs:	<input type="text" value="--"/>	<input type="text" value="76.65"/>
FEH / FSR conversion factor:	<input type="text" value="1.05"/>	<input type="text" value="1.05"/>
SAAR (mm):	<input type="text" value="875"/>	<input type="text" value="875"/>
M5-60 Rainfall Depth (mm):	<input type="text" value="17"/>	<input type="text" value="17"/>
'r' Ratio M5-60/M5-2 day:	<input type="text" value="0.3"/>	<input type="text" value="0.3"/>
Hydrological region:	<input type="text" value="9"/>	<input type="text" value="9"/>
Growth curve factor 1 year:	<input type="text" value="0.88"/>	<input type="text" value="0.88"/>
Growth curve factor 10 year:	<input type="text" value="1.42"/>	<input type="text" value="1.42"/>
Growth curve factor 30 year:	<input type="text" value="1.78"/>	<input type="text" value="1.78"/>
Growth curve factor 100 years:	<input type="text" value="2.18"/>	<input type="text" value="2.18"/>
Q_{BAR} for total site area (l/s):	<input type="text" value="0.29"/>	<input type="text" value="0.29"/>
Q_{BAR} for net site area (l/s):	<input type="text" value="0.29"/>	<input type="text" value="0.29"/>

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):	40	40
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):	0	0
1 in 100 year (l/s):	2	2	Total storage 1/100 years (m³):	40	40

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Calculated by:

Site name:

Site location:

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Site Details

Latitude:

Longitude:

Reference:

Date:

Site characteristics

Total site area (ha):	<input type="text" value="0.1050"/>
Significant public open space (ha):	<input type="text" value="0"/>
Area positively drained (ha):	<input type="text" value="0.105"/>
Impermeable area (ha):	<input type="text" value="0.105"/>
Percentage of drained area that is impermeable (%):	<input type="text" value="100"/>
Impervious area drained via infiltration (ha):	<input type="text" value="0"/>
Return period for infiltration system design (year):	<input type="text" value="10"/>
Impervious area drained to rainwater harvesting (ha):	<input type="text" value="0"/>
Return period for rainwater harvesting system (year):	<input type="text" value="10"/>
Compliance factor for rainwater harvesting system (%):	<input type="text" value="66"/>
Net site area for storage volume design (ha):	<input type="text" value="0.11"/>
Net impermeable area for storage volume design (ha):	<input type="text" value="0.11"/>
Pervious area contribution to runoff (%):	<input type="text" value="30"/>

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	<input type="text" value="1.4"/>
Urban creep allowance factor:	<input type="text" value="1"/>
Volume control approach	<input type="text" value="Use long term storage"/>
Interception rainfall depth (mm):	<input type="text" value="5"/>
Minimum flow rate (l/s):	<input type="text" value="2"/>

Methodology

Q_{MED} estimation method:

BFI and SPR method:

Soil characteristics

HOST class:	<input type="text" value="--"/>	<input type="text" value="--"/>
BFI HOST:	<input type="text" value="--"/>	<input type="text" value="0.682"/>
SPR HOST:	<input type="text" value="--"/>	<input type="text" value="0.3"/>

Hydrological characteristics

Q_{MED} :	<input type="text" value="--"/>	<input type="text" value="0.26"/>
Q_{BAR} / Q_{MED} conversion factor:	<input type="text" value="--"/>	<input type="text" value="1.075"/>
Rainfall 100 yrs 6 hrs:	<input type="text" value="--"/>	<input type="text" value="61"/>
Rainfall 100 yrs 12 hrs:	<input type="text" value="--"/>	<input type="text" value="75.92"/>
FEH / FSR conversion factor:	<input type="text" value="1.04"/>	<input type="text" value="1.04"/>
SAAR (mm):	<input type="text" value="859"/>	<input type="text" value="859"/>
M5-60 Rainfall Depth (mm):	<input type="text" value="17"/>	<input type="text" value="17"/>
'r' Ratio M5-60/M5-2 day:	<input type="text" value="0.3"/>	<input type="text" value="0.3"/>
Hydrological region:	<input type="text" value="9"/>	<input type="text" value="9"/>
Growth curve factor 1 year:	<input type="text" value="0.88"/>	<input type="text" value="0.88"/>
Growth curve factor 10 year:	<input type="text" value="1.42"/>	<input type="text" value="1.42"/>
Growth curve factor 30 year:	<input type="text" value="1.78"/>	<input type="text" value="1.78"/>
Growth curve factor 100 years:	<input type="text" value="2.18"/>	<input type="text" value="2.18"/>
Q_{BAR} for total site area (l/s):	<input type="text" value="0.28"/>	<input type="text" value="0.28"/>
Q_{BAR} for net site area (l/s):	<input type="text" value="0.28"/>	<input type="text" value="0.28"/>

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):	39	39
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):	0	0
1 in 100 year (l/s):	2	2	Total storage 1/100 years (m³):	39	39

This report was produced using the storage estimation tool developed by HRWallingford and available at 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 <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. 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, CEH, Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.