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CONSULTANTS@COWIANDCONSULT.CO.UK

Total Surface Area

Storm duration (Min.)

5
10
15
30
60
120
240
360
600
1440

Proposed soakaway **material** requires a **void ratio $\geq 95\%$** .
The use of Polypipe Permavoid sub- base replacement
system is recommended. Proposed design includes for
40% increase due to Climate Change.

Job No.	435050	Sheet	Date	Jun-21
Job	Springfields	By TB	Checked	EG

Permavoid Attenuation Storage for Roofs, Access Road & Parking

Total Surface Area

Area	1820.000 m ²
Urban Creep	1.100 m ²
	2002.000 m ²

30 year return period + 40%

		Storm duration (Min.)
R5	0.022 m	5
R10	0.028 m	10
R15	0.031 m	15
R30	0.039 m	30
R60	0.048 m	60
R120	0.059 m	120
R240	0.073 m	240
R360	0.082 m	360
R600	0.095 m	600
R1440	0.123 m	1440

Inflow to attenuation system

I5	44.18 m ³
I10	55.24 m ³
I15	62.79 m ³
I30	77.86 m ³
I60	96.19 m ³
I120	118.46 m ³
I240	145.54 m ³
I360	164.01 m ³
I600	190.49 m ³
I1440	245.76 m ³

Outflow from Tank

f	2.00E-03 m ³ /s
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Soakaway dims:

L	745 m
W	1 m
Depth	0.3 m

As50	1
Void ratio	95 %

Outflow from Tank:

O5	0.6000 m ³
O10	1.2000 m ³
O15	1.8000 m ³
O30	3.6000 m ³
O60	7.2000 m ³
O120	14.4000 m ³
O240	28.8000 m ³
O360	43.2000 m ³
O600	72.0000 m ³
O1440	172.8000 m ³

Storage required:

S5	43.58 m ³
S10	54.04 m ³
S15	60.99 m ³
S30	74.26 m ³
S60	88.99 m ³
S120	104.06 m ³
S240	116.74 m ³
S360	120.81 m ³
S600	118.49 m ³
S1440	72.96 m ³

Time to half drain:

ts50	3.03 hours
ts50	3.75 hours
ts50	4.24 hours
ts50	5.16 hours
ts50	6.18 hours
ts50	7.23 hours
ts50	8.11 hours
ts50	8.39 hours
ts50	8.23 hours
ts50	5.07 hours

Storage provided **212.3** m³

Critical storm = **S360**

Storage required = **120.81**

Time to half discharge= **8.39** Hours (Acceptable time as 1/30 year storm)

Tank size proposed is satisfactory

Job No.	435050	Sheet	Date	Jun-21
Job	Springfields	By TB	Checked	EG

Permavoid Attenuation Storage for Roofs, Access Road & Parking

Total Surface Area

Area	1820.000 m ²
Urban Creep	1.100 m ²
	2002.000 m ²

100 year return period + 40%

		Storm duration (Min.)
R5	0.032 m	5
R10	0.040 m	10
R15	0.045 m	15
R30	0.056 m	30
R60	0.069 m	60
R120	0.084 m	120
R240	0.103 m	240
R360	0.116 m	360
R600	0.135 m	600
R1440	0.174 m	1440

Inflow to attenuation system

I5	64.90 m ³
I10	80.42 m ³
I15	91.02 m ³
I30	112.17 m ³
I60	137.90 m ³
I120	169.16 m ³
I240	207.17 m ³
I360	233.10 m ³
I600	270.28 m ³
I1440	347.86 m ³

Outflow from Tank

f	2.00E-03 m ³ /s
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Soakaway dims:

L	745 m
W	1 m
Depth	0.3 m

As50	1
Void ratio	95 %

Outflow from Tank:

O5	0.6000 m ³
O10	1.2000 m ³
O15	1.8000 m ³
O30	3.6000 m ³
O60	7.2000 m ³
O120	14.4000 m ³
O240	28.8000 m ³
O360	43.2000 m ³
O600	72.0000 m ³
O1440	172.8000 m ³

Storage required:

S5	64.30 m ³
S10	79.22 m ³
S15	89.22 m ³
S30	108.57 m ³
S60	130.70 m ³
S120	154.76 m ³
S240	178.37 m ³
S360	189.90 m ³
S600	198.28 m ³
S1440	175.06 m ³

Time to half drain:

ts50	4.46 hours
ts50	5.50 hours
ts50	6.20 hours
ts50	7.54 hours
ts50	9.08 hours
ts50	10.75 hours
ts50	12.39 hours
ts50	13.19 hours
ts50	13.77 hours
ts50	12.16 hours

Storage provided **212.3** m³

Critical storm = **S600**

Storage required = **198.28**

Time to half discharge = **13.77** Hours (Acceptable time as 1/100 year storm)

Tank size proposed is satisfactory

For increase from 10 year storm to 100 year storm use,

Bilham's formula $r \text{ (mm)} = (((1.25T)/N)^{(1/3.55)}) \times 25.4$

T = storm duration in hours

N = No. of storms in 10 years

T	N	r	0.4 10 year return period
0.08333	0.1	0.02315	0.03241527 R5
0.16667	0.1	0.02869	0.040171329 R10
0.25	0.1	0.03247	0.045462061 R15
0.5	0.1	0.04002	0.056031245 R30
1	0.1	0.0492	0.068879338 R60
2	0.1	0.06036	0.084497712 R120
4	0.1	0.07392	0.103483692 R240
6	0.1	0.08317	0.116434821 R360
10	0.1	0.10	0.135004879 R600
24	0.1	0.12411	0.173757739 R1440

Calculated by:	Hedwilena Silva
Site name:	Springfields
Site location:	Hook Lane, Aldingbourne

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.

Site Details

Latitude:	50.83301° N
Longitude:	0.67289° W
Reference:	10936924
Date:	Jun 28 2021 13:47

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	0.4662
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Methodology

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

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	749	749
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	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):	0.92	0.92
1 in 1 year (l/s):	0.78	0.78
1 in 30 years (l/s):	2.12	2.12
1 in 100 year (l/s):	2.93	2.93
1 in 200 years (l/s):	3.44	3.44

This report was produced using the greenfield runoff tool developed by HR Wallingford 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 www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of 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, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.