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58-62 Ock Street Abingdon Oxon OX14 5BZ	Kitchener House West Drayton Careys New Homes	
Date 10/02/2017 16:25 File STOM ATTENUATION TANK -...	Designed by mcshane Checked by	
Micro Drainage		Source Control 2016.1

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 55 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	99.412	0.412	0.0	5.0	5.0	20.3	O K
30 min Summer	99.503	0.503	0.0	5.0	5.0	24.7	O K
60 min Summer	99.539	0.539	0.0	5.0	5.0	26.5	O K
120 min Summer	99.522	0.522	0.0	5.0	5.0	25.7	O K
180 min Summer	99.480	0.480	0.0	5.0	5.0	23.6	O K
240 min Summer	99.429	0.429	0.0	5.0	5.0	21.1	O K
360 min Summer	99.330	0.330	0.0	5.0	5.0	16.2	O K
480 min Summer	99.253	0.253	0.0	5.0	5.0	12.4	O K
600 min Summer	99.196	0.196	0.0	5.0	5.0	9.6	O K
720 min Summer	99.157	0.157	0.0	5.0	5.0	7.7	O K
960 min Summer	99.119	0.119	0.0	4.6	4.6	5.8	O K
1440 min Summer	99.092	0.092	0.0	3.5	3.5	4.6	O K
15 min Winter	99.468	0.468	0.0	5.0	5.0	23.1	O K
30 min Winter	99.572	0.572	0.0	5.0	5.0	28.2	O K
60 min Winter	99.619	0.619	0.0	5.0	5.0	30.3	O K
120 min Winter	99.588	0.588	0.0	5.0	5.0	28.9	O K
180 min Winter	99.525	0.525	0.0	5.0	5.0	25.9	O K
240 min Winter	99.452	0.452	0.0	5.0	5.0	22.2	O K
360 min Winter	99.296	0.296	0.0	5.0	5.0	14.6	O K
480 min Winter	99.191	0.191	0.0	5.0	5.0	9.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	128.285	0.0	23.5	17
30 min Summer	84.226	0.0	30.9	31
60 min Summer	52.662	0.0	38.7	52
120 min Summer	31.800	0.0	46.7	84
180 min Summer	23.353	0.0	51.5	120
240 min Summer	18.644	0.0	54.8	154
360 min Summer	13.543	0.0	59.7	216
480 min Summer	10.792	0.0	63.4	274
600 min Summer	9.043	0.0	66.4	330
720 min Summer	7.823	0.0	69.0	384
960 min Summer	6.219	0.0	73.1	494
1440 min Summer	4.493	0.0	79.2	736
15 min Winter	128.285	0.0	26.4	17
30 min Winter	84.226	0.0	34.6	31
60 min Winter	52.662	0.0	43.3	56
120 min Winter	31.800	0.0	52.3	90
180 min Winter	23.353	0.0	57.6	130
240 min Winter	18.644	0.0	61.4	166
360 min Winter	13.543	0.0	66.9	228
480 min Winter	10.792	0.0	71.0	280

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
600 min Winter	99.132	0.132	0.0	4.9	4.9	6.5	O K
720 min Winter	99.113	0.113	0.0	4.4	4.4	5.6	O K
960 min Winter	99.093	0.093	0.0	3.5	3.5	4.6	O K
1440 min Winter	99.075	0.075	0.0	2.6	2.6	3.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.043	0.0	74.4	326
720 min Winter	7.823	0.0	77.2	378
960 min Winter	6.219	0.0	81.9	498
1440 min Winter	4.493	0.0	88.7	736

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	1440
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.098

Time (mins)	Area
From:	To: (ha)
0	4 0.098

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Model Details

Storage is Online Cover Level (m) 100.000

Cellular Storage Structure

Invert Level (m) 99.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	51.8	51.8	0.700	0.0	73.4
0.600	51.8	73.4			

Hydro-Brake Optimum® Outflow Control

Unit Reference MD-SHE-0111-5000-0610-5000
Design Head (m) 0.610
Design Flow (l/s) 5.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 111
Invert Level (m) 99.000
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.610	5.0
Flush-Flo™	0.197	5.0
Kick-Flo®	0.436	4.3
Mean Flow over Head Range	-	4.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.9	1.200	6.8	3.000	10.5	7.000	15.8
0.200	5.0	1.400	7.4	3.500	11.3	7.500	16.3
0.300	4.9	1.600	7.8	4.000	12.1	8.000	16.9
0.400	4.6	1.800	8.3	4.500	12.8	8.500	17.4
0.500	4.6	2.000	8.7	5.000	13.4	9.000	17.9
0.600	5.0	2.200	9.1	5.500	14.1	9.500	18.4
0.800	5.7	2.400	9.5	6.000	14.7		
1.000	6.3	2.600	9.9	6.500	15.2		