

Atkins

Page 1

Woodcote Grove
Ashley Road
Epsom Surrey KT18 5BW

Date 22/08/2019 12:06
File CELLULAR STORAGE CALCS....

Designed by GIWA8103
Checked by

Micro
Drainage

InnovyzeSource Control 2018.1

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 127 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status
15 min Summer	55.863	0.363	0.0	1.0	1.0	8.3	O K
30 min Summer	55.966	0.466	0.0	1.1	1.1	10.6	O K
60 min Summer	56.044	0.544	0.0	1.1	1.1	12.4	O K
120 min Summer	56.062	0.562	0.0	1.1	1.1	12.8	O K
180 min Summer	56.045	0.545	0.0	1.1	1.1	12.4	O K
240 min Summer	56.025	0.525	0.0	1.1	1.1	12.0	O K
360 min Summer	55.987	0.487	0.0	1.1	1.1	11.1	O K
480 min Summer	55.947	0.447	0.0	1.1	1.1	10.2	O K
600 min Summer	55.908	0.408	0.0	1.0	1.0	9.3	O K
720 min Summer	55.870	0.370	0.0	1.0	1.0	8.4	O K
960 min Summer	55.799	0.299	0.0	1.0	1.0	6.8	O K
1440 min Summer	55.681	0.181	0.0	1.0	1.0	4.1	O K
2160 min Summer	55.564	0.064	0.0	0.9	0.9	1.5	O K
2880 min Summer	55.508	0.008	0.0	0.9	0.9	0.2	O K
4320 min Summer	55.500	0.000	0.0	0.7	0.7	0.0	O K
5760 min Summer	55.500	0.000	0.0	0.6	0.6	0.0	O K
7200 min Summer	55.500	0.000	0.0	0.5	0.5	0.0	O K
8640 min Summer	55.500	0.000	0.0	0.4	0.4	0.0	O K
10080 min Summer	55.500	0.000	0.0	0.4	0.4	0.0	O K
15 min Winter	55.913	0.413	0.0	1.0	1.0	9.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	127.517	0.0	9.3	18
30 min Summer	85.701	0.0	12.5	32
60 min Summer	54.957	0.0	16.1	62
120 min Summer	34.010	0.0	19.8	106
180 min Summer	25.295	0.0	22.2	138
240 min Summer	20.351	0.0	23.8	170
360 min Summer	14.971	0.0	26.3	240
480 min Summer	12.028	0.0	28.1	308
600 min Summer	10.141	0.0	29.7	374
720 min Summer	8.817	0.0	30.9	442
960 min Summer	7.063	0.0	33.0	570
1440 min Summer	5.157	0.0	36.2	810
2160 min Summer	3.757	0.0	39.5	1152
2880 min Summer	2.997	0.0	42.1	1472
4320 min Summer	2.176	0.0	45.8	0
5760 min Summer	1.731	0.0	48.6	0
7200 min Summer	1.449	0.0	50.9	0
8640 min Summer	1.255	0.0	52.9	0
10080 min Summer	1.111	0.0	54.6	0
15 min Winter	127.517	0.0	10.4	18

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Atkins		Page 2					
Woodcote Grove Ashley Road Epsom Surrey KT18 5BW							
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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
30 min Winter	56.033	0.533	0.0	1.1	1.1	12.2	O K
60 min Winter	56.131	0.631	0.0	1.1	1.1	14.4	O K
120 min Winter	56.169	0.669	0.0	1.1	1.1	15.2	O K
180 min Winter	56.145	0.645	0.0	1.1	1.1	14.7	O K
240 min Winter	56.115	0.615	0.0	1.1	1.1	14.0	O K
360 min Winter	56.057	0.557	0.0	1.1	1.1	12.7	O K
480 min Winter	55.995	0.495	0.0	1.1	1.1	11.3	O K
600 min Winter	55.934	0.434	0.0	1.1	1.1	9.9	O K
720 min Winter	55.876	0.376	0.0	1.0	1.0	8.6	O K
960 min Winter	55.770	0.270	0.0	1.0	1.0	6.2	O K
1440 min Winter	55.606	0.106	0.0	0.9	0.9	2.4	O K
2160 min Winter	55.500	0.000	0.0	0.9	0.9	0.0	O K
2880 min Winter	55.500	0.000	0.0	0.7	0.7	0.0	O K
4320 min Winter	55.500	0.000	0.0	0.5	0.5	0.0	O K
5760 min Winter	55.500	0.000	0.0	0.4	0.4	0.0	O K
7200 min Winter	55.500	0.000	0.0	0.3	0.3	0.0	O K
8640 min Winter	55.500	0.000	0.0	0.3	0.3	0.0	O K
10080 min Winter	55.500	0.000	0.0	0.3	0.3	0.0	O K
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30 min Winter	85.701	0.0	14.0	32			
60 min Winter	54.957	0.0	18.0	60			
120 min Winter	34.010	0.0	22.2	116			
180 min Winter	25.295	0.0	24.9	146			
240 min Winter	20.351	0.0	26.7	184			
360 min Winter	14.971	0.0	29.4	260			
480 min Winter	12.028	0.0	31.6	334			
600 min Winter	10.141	0.0	33.2	404			
720 min Winter	8.817	0.0	34.7	474			
960 min Winter	7.063	0.0	37.0	606			
1440 min Winter	5.157	0.0	40.5	838			
2160 min Winter	3.757	0.0	44.3	0			
2880 min Winter	2.997	0.0	47.1	0			
4320 min Winter	2.176	0.0	51.3	0			
5760 min Winter	1.731	0.0	54.4	0			
7200 min Winter	1.449	0.0	57.0	0			
8640 min Winter	1.255	0.0	59.2	0			
10080 min Winter	1.111	0.0	61.1	0			
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Atkins		Page 3																																	
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Atkins		Page 4
Woodcote Grove Ashley Road Epsom Surrey KT18 5BW		
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Model Details

Storage is Online Cover Level (m) 57.350

Cellular Storage Structure

Invert Level (m) 55.500 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	24.0	0.0	2.600	0.0	0.0
0.200	24.0	0.0	2.800	0.0	0.0
0.400	24.0	0.0	3.000	0.0	0.0
0.600	24.0	0.0	3.200	0.0	0.0
0.800	24.0	0.0	3.400	0.0	0.0
1.000	0.0	0.0	3.600	0.0	0.0
1.200	0.0	0.0	3.800	0.0	0.0
1.400	0.0	0.0	4.000	0.0	0.0
1.600	0.0	0.0	4.200	0.0	0.0
1.800	0.0	0.0	4.400	0.0	0.0
2.000	0.0	0.0	4.600	0.0	0.0
2.200	0.0	0.0	4.800	0.0	0.0
2.400	0.0	0.0	5.000	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0044-9000-1000-9000
Design Head (m) 1.000
Design Flow (l/s) 0.9
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 44
Invert Level (m) 54.500
Minimum Outlet Pipe Diameter (mm) 75
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	0.9
Flush-Flo™	0.194	0.7
Kick-Flo®	0.394	0.6
Mean Flow over Head Range	-	0.7

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

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