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

Half Drain Time : 11 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	9.172	0.172	0.0	3.5	3.5	2.9	O K
30 min Summer	9.204	0.204	0.0	3.5	3.5	3.5	O K
60 min Summer	9.194	0.194	0.0	3.5	3.5	3.3	O K
120 min Summer	9.145	0.145	0.0	3.5	3.5	2.5	O K
180 min Summer	9.110	0.110	0.0	3.4	3.4	1.9	O K
240 min Summer	9.094	0.094	0.0	3.0	3.0	1.6	O K
360 min Summer	9.077	0.077	0.0	2.3	2.3	1.3	O K
480 min Summer	9.067	0.067	0.0	1.9	1.9	1.1	O K
600 min Summer	9.061	0.061	0.0	1.6	1.6	1.0	O K
720 min Summer	9.056	0.056	0.0	1.4	1.4	1.0	O K
960 min Summer	9.050	0.050	0.0	1.2	1.2	0.8	O K
1440 min Summer	9.042	0.042	0.0	0.9	0.9	0.7	O K
2160 min Summer	9.035	0.035	0.0	0.6	0.6	0.6	O K
2880 min Summer	9.031	0.031	0.0	0.5	0.5	0.5	O K
4320 min Summer	9.026	0.026	0.0	0.4	0.4	0.4	O K
5760 min Summer	9.023	0.023	0.0	0.3	0.3	0.4	O K
7200 min Summer	9.021	0.021	0.0	0.2	0.2	0.4	O K
8640 min Summer	9.019	0.019	0.0	0.2	0.2	0.3	O K
10080 min Summer	9.018	0.018	0.0	0.2	0.2	0.3	O K
15 min Winter	9.200	0.200	0.0	3.5	3.5	3.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	120.736	0.0	5.4	20
30 min Summer	79.515	0.0	7.1	28
60 min Summer	49.937	0.0	9.0	44
120 min Summer	30.331	0.0	10.9	74
180 min Summer	22.368	0.0	12.1	102
240 min Summer	17.919	0.0	12.9	132
360 min Summer	13.022	0.0	14.1	192
480 min Summer	10.389	0.0	15.0	252
600 min Summer	8.713	0.0	15.7	312
720 min Summer	7.543	0.0	16.3	370
960 min Summer	6.004	0.0	17.3	492
1440 min Summer	4.345	0.0	18.8	734
2160 min Summer	3.140	0.0	20.3	1100
2880 min Summer	2.491	0.0	21.5	1436
4320 min Summer	1.794	0.0	23.2	2192
5760 min Summer	1.421	0.0	24.5	2904
7200 min Summer	1.185	0.0	25.6	3672
8640 min Summer	1.021	0.0	26.4	4392
10080 min Summer	0.900	0.0	27.2	5128
15 min Winter	120.736	0.0	6.1	20

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
30 min Winter	9.331	0.331	0.0	3.5	3.5	4.0	O K
60 min Winter	9.206	0.206	0.0	3.5	3.5	3.5	O K
120 min Winter	9.124	0.124	0.0	3.5	3.5	2.1	O K
180 min Winter	9.093	0.093	0.0	2.9	2.9	1.6	O K
240 min Winter	9.079	0.079	0.0	2.4	2.4	1.4	O K
360 min Winter	9.065	0.065	0.0	1.8	1.8	1.1	O K
480 min Winter	9.057	0.057	0.0	1.5	1.5	1.0	O K
600 min Winter	9.051	0.051	0.0	1.2	1.2	0.9	O K
720 min Winter	9.047	0.047	0.0	1.1	1.1	0.8	O K
960 min Winter	9.042	0.042	0.0	0.9	0.9	0.7	O K
1440 min Winter	9.035	0.035	0.0	0.6	0.6	0.6	O K
2160 min Winter	9.029	0.029	0.0	0.4	0.4	0.5	O K
2880 min Winter	9.026	0.026	0.0	0.4	0.4	0.4	O K
4320 min Winter	9.022	0.022	0.0	0.3	0.3	0.4	O K
5760 min Winter	9.019	0.019	0.0	0.2	0.2	0.3	O K
7200 min Winter	9.018	0.018	0.0	0.2	0.2	0.3	O K
8640 min Winter	9.016	0.016	0.0	0.1	0.1	0.3	O K
10080 min Winter	9.015	0.015	0.0	0.1	0.1	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	79.515	0.0	8.0	30
60 min Winter	49.937	0.0	10.1	46
120 min Winter	30.331	0.0	12.2	76
180 min Winter	22.368	0.0	13.5	102
240 min Winter	17.919	0.0	14.4	132
360 min Winter	13.022	0.0	15.7	192
480 min Winter	10.389	0.0	16.7	250
600 min Winter	8.713	0.0	17.6	310
720 min Winter	7.543	0.0	18.2	368
960 min Winter	6.004	0.0	19.4	500
1440 min Winter	4.345	0.0	21.0	738
2160 min Winter	3.140	0.0	22.8	1112
2880 min Winter	2.491	0.0	24.1	1464
4320 min Winter	1.794	0.0	26.0	2204
5760 min Winter	1.421	0.0	27.5	2944
7200 min Winter	1.185	0.0	28.6	3648
8640 min Winter	1.021	0.0	29.6	4408
10080 min Winter	0.900	0.0	30.5	5144

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)	19.000	Shortest Storm (mins)	15
Ratio R	0.395	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.024

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.008	4	8	0.008	8	12	0.008

Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	18.0	18.0	0.300	0.0	21.6
0.200	18.0	21.6			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0097-3500-0400-3500
Design Head (m)	0.400
Design Flow (l/s)	3.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	97
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	3.5
Flush-Flo™	0.149	3.5
Kick-Flo®	0.302	3.1
Mean Flow over Head Range	-	2.9

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	3.2	1.200	5.8	3.000	9.0	7.000	13.5
0.200	3.4	1.400	6.3	3.500	9.6	7.500	14.0
0.300	3.1	1.600	6.7	4.000	10.3	8.000	14.5
0.400	3.5	1.800	7.0	4.500	10.8	8.500	14.9
0.500	3.9	2.000	7.4	5.000	11.4	9.000	15.4
0.600	4.2	2.200	7.7	5.500	12.0	9.500	15.8
0.800	4.8	2.400	8.1	6.000	12.5		
1.000	5.3	2.600	8.4	6.500	13.1		