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

Half Drain Time : 4 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control Σ (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	50.523	0.623	0.0	3.0	3.0	1.2	O K
30 min Summer	50.511	0.611	0.0	3.0	3.0	1.2	O K
60 min Summer	50.286	0.386	0.0	3.0	3.0	0.7	O K
120 min Summer	50.036	0.136	0.0	2.8	2.8	0.3	O K
180 min Summer	49.990	0.090	0.0	2.3	2.3	0.2	O K
240 min Summer	49.974	0.074	0.0	1.9	1.9	0.1	O K
360 min Summer	49.960	0.060	0.0	1.4	1.4	0.1	O K
480 min Summer	49.952	0.052	0.0	1.1	1.1	0.1	O K
600 min Summer	49.947	0.047	0.0	1.0	1.0	0.1	O K
720 min Summer	49.943	0.043	0.0	0.8	0.8	0.1	O K
960 min Summer	49.938	0.038	0.0	0.7	0.7	0.1	O K
1440 min Summer	49.932	0.032	0.0	0.5	0.5	0.1	O K
2160 min Summer	49.927	0.027	0.0	0.4	0.4	0.1	O K
2880 min Summer	49.924	0.024	0.0	0.3	0.3	0.0	O K
4320 min Summer	49.920	0.020	0.0	0.2	0.2	0.0	O K
5760 min Summer	49.918	0.018	0.0	0.2	0.2	0.0	O K
7200 min Summer	49.917	0.017	0.0	0.1	0.1	0.0	O K
8640 min Summer	49.915	0.015	0.0	0.1	0.1	0.0	O K
10080 min Summer	49.915	0.015	0.0	0.1	0.1	0.0	O K
15 min Winter	50.612	0.712	0.0	3.0	3.0	1.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	126.478	0.0	2.8	13
30 min Summer	84.424	0.0	3.8	21
60 min Summer	53.779	0.0	4.8	36
120 min Summer	33.103	0.0	6.0	64
180 min Summer	24.574	0.0	6.6	94
240 min Summer	19.761	0.0	7.1	124
360 min Summer	14.466	0.0	7.8	184
480 min Summer	11.596	0.0	8.3	246
600 min Summer	9.760	0.0	8.8	304
720 min Summer	8.474	0.0	9.2	366
960 min Summer	6.774	0.0	9.8	484
1440 min Summer	4.933	0.0	10.7	732
2160 min Summer	3.584	0.0	11.6	1064
2880 min Summer	2.854	0.0	12.3	1448
4320 min Summer	2.067	0.0	13.4	2132
5760 min Summer	1.642	0.0	14.2	2840
7200 min Summer	1.373	0.0	14.8	3560
8640 min Summer	1.186	0.0	15.4	4384
10080 min Summer	1.048	0.0	15.8	4984
15 min Winter	126.478	0.0	3.2	13

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

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	50.542	0.642	0.0	3.0	3.0	1.2	O K
60 min Winter	50.167	0.267	0.0	3.0	3.0	0.5	O K
120 min Winter	49.989	0.089	0.0	2.3	2.3	0.2	O K
180 min Winter	49.969	0.069	0.0	1.7	1.7	0.1	O K
240 min Winter	49.960	0.060	0.0	1.4	1.4	0.1	O K
360 min Winter	49.949	0.049	0.0	1.0	1.0	0.1	O K
480 min Winter	49.943	0.043	0.0	0.8	0.8	0.1	O K
600 min Winter	49.939	0.039	0.0	0.7	0.7	0.1	O K
720 min Winter	49.936	0.036	0.0	0.6	0.6	0.1	O K
960 min Winter	49.932	0.032	0.0	0.5	0.5	0.1	O K
1440 min Winter	49.927	0.027	0.0	0.4	0.4	0.1	O K
2160 min Winter	49.923	0.023	0.0	0.3	0.3	0.0	O K
2880 min Winter	49.920	0.020	0.0	0.2	0.2	0.0	O K
4320 min Winter	49.917	0.017	0.0	0.2	0.2	0.0	O K
5760 min Winter	49.915	0.015	0.0	0.1	0.1	0.0	O K
7200 min Winter	49.914	0.014	0.0	0.1	0.1	0.0	O K
8640 min Winter	49.913	0.013	0.0	0.1	0.1	0.0	O K
10080 min Winter	49.912	0.012	0.0	0.1	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	84.424	0.0	4.3	22
60 min Winter	53.779	0.0	5.4	36
120 min Winter	33.103	0.0	6.7	64
180 min Winter	24.574	0.0	7.4	94
240 min Winter	19.761	0.0	8.0	122
360 min Winter	14.466	0.0	8.7	186
480 min Winter	11.596	0.0	9.4	246
600 min Winter	9.760	0.0	9.8	300
720 min Winter	8.474	0.0	10.2	364
960 min Winter	6.774	0.0	10.9	480
1440 min Winter	4.933	0.0	11.9	718
2160 min Winter	3.584	0.0	13.0	1096
2880 min Winter	2.854	0.0	13.8	1456
4320 min Winter	2.067	0.0	15.0	2132
5760 min Winter	1.642	0.0	15.9	2912
7200 min Winter	1.373	0.0	16.6	3544
8640 min Winter	1.186	0.0	17.2	4480
10080 min Winter	1.048	0.0	17.7	4960

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	0.365	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.012

Time (mins) From:	To:	Area (ha)
0	4	0.012

Model Details

Storage is Online Cover Level (m) 51.300

Cellular Storage Structure

Invert Level (m) 49.900 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	2.0	2.0	0.900	0.0	6.8
0.800	2.0	6.8			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0085-3000-0800-3000
Design Head (m)	0.800
Design Flow (l/s)	3.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	85
Invert Level (m)	49.900
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	3.0
Flush-Flo™	0.239	3.0
Kick-Flo®	0.517	2.5
Mean Flow over Head Range	-	2.6

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	2.6	1.200	3.6	3.000	5.5	7.000	8.3
0.200	3.0	1.400	3.9	3.500	6.0	7.500	8.5
0.300	3.0	1.600	4.1	4.000	6.3	8.000	8.8
0.400	2.9	1.800	4.4	4.500	6.7	8.500	9.0
0.500	2.6	2.000	4.6	5.000	7.0	9.000	9.3
0.600	2.6	2.200	4.8	5.500	7.4	9.500	9.6
0.800	3.0	2.400	5.0	6.000	7.7		
1.000	3.3	2.600	5.2	6.500	8.0		