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

Half Drain Time : 80 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	74.375	0.275	0.0	3.5	3.5	18.8	O K
30 min Summer	74.456	0.356	0.0	3.5	3.5	24.4	O K
60 min Summer	74.521	0.421	0.0	3.5	3.5	28.5	O K
120 min Summer	75.000	0.900	0.0	3.5	3.5	30.0	Flood Risk
180 min Summer	74.546	0.446	0.0	3.5	3.5	29.3	O K
240 min Summer	74.509	0.409	0.0	3.5	3.5	27.9	O K
360 min Summer	74.463	0.363	0.0	3.5	3.5	24.9	O K
480 min Summer	74.421	0.321	0.0	3.5	3.5	21.9	O K
600 min Summer	74.382	0.282	0.0	3.5	3.5	19.3	O K
720 min Summer	74.348	0.248	0.0	3.5	3.5	17.0	O K
960 min Summer	74.294	0.194	0.0	3.4	3.4	13.3	O K
1440 min Summer	74.229	0.129	0.0	3.1	3.1	8.8	O K
2160 min Summer	74.194	0.094	0.0	2.6	2.6	6.4	O K
2880 min Summer	74.178	0.078	0.0	2.1	2.1	5.3	O K
4320 min Summer	74.163	0.063	0.0	1.6	1.6	4.3	O K
5760 min Summer	74.154	0.054	0.0	1.3	1.3	3.7	O K
7200 min Summer	74.149	0.049	0.0	1.0	1.0	3.3	O K
8640 min Summer	74.145	0.045	0.0	0.9	0.9	3.1	O K
10080 min Summer	74.142	0.042	0.0	0.8	0.8	2.9	O K
15 min Winter	74.375	0.275	0.0	3.5	3.5	18.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	116.878	0.0	21.8	23
30 min Summer	78.200	0.0	29.2	35
60 min Summer	49.937	0.0	37.4	62
120 min Summer	30.810	0.0	46.2	98
180 min Summer	22.897	0.0	51.5	130
240 min Summer	18.424	0.0	55.2	164
360 min Summer	13.506	0.0	60.7	232
480 min Summer	10.835	0.0	65.0	296
600 min Summer	9.126	0.0	68.4	358
720 min Summer	7.927	0.0	71.3	420
960 min Summer	6.342	0.0	76.0	536
1440 min Summer	4.622	0.0	83.1	766
2160 min Summer	3.362	0.0	90.7	1108
2880 min Summer	2.679	0.0	96.4	1472
4320 min Summer	1.942	0.0	104.8	2204
5760 min Summer	1.544	0.0	111.1	2936
7200 min Summer	1.291	0.0	116.2	3672
8640 min Summer	1.116	0.0	120.4	4408
10080 min Summer	0.987	0.0	124.2	5136
15 min Winter	116.878	0.0	21.8	23

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	74.456	0.356	0.0	3.5	3.5	24.3	O K
60 min Winter	74.520	0.420	0.0	3.5	3.5	28.5	O K
120 min Winter	74.558	0.458	0.0	3.5	3.5	29.5	O K
180 min Winter	74.514	0.414	0.0	3.5	3.5	28.2	O K
240 min Winter	74.482	0.382	0.0	3.5	3.5	26.1	O K
360 min Winter	74.415	0.315	0.0	3.5	3.5	21.5	O K
480 min Winter	74.355	0.255	0.0	3.5	3.5	17.5	O K
600 min Winter	74.307	0.207	0.0	3.4	3.4	14.1	O K
720 min Winter	74.268	0.168	0.0	3.3	3.3	11.5	O K
960 min Winter	74.219	0.119	0.0	3.0	3.0	8.1	O K
1440 min Winter	74.186	0.086	0.0	2.4	2.4	5.9	O K
2160 min Winter	74.168	0.068	0.0	1.8	1.8	4.6	O K
2880 min Winter	74.158	0.058	0.0	1.4	1.4	4.0	O K
4320 min Winter	74.148	0.048	0.0	1.0	1.0	3.3	O K
5760 min Winter	74.142	0.042	0.0	0.8	0.8	2.9	O K
7200 min Winter	74.138	0.038	0.0	0.7	0.7	2.6	O K
8640 min Winter	74.135	0.035	0.0	0.6	0.6	2.4	O K
10080 min Winter	74.133	0.033	0.0	0.5	0.5	2.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	78.200	0.0	29.2	35
60 min Winter	49.937	0.0	37.4	62
120 min Winter	30.810	0.0	46.2	100
180 min Winter	22.897	0.0	51.5	138
240 min Winter	18.424	0.0	55.2	174
360 min Winter	13.506	0.0	60.7	244
480 min Winter	10.835	0.0	65.0	308
600 min Winter	9.126	0.0	68.4	368
720 min Winter	7.927	0.0	71.3	426
960 min Winter	6.342	0.0	76.0	530
1440 min Winter	4.622	0.0	83.1	756
2160 min Winter	3.362	0.0	90.7	1108
2880 min Winter	2.679	0.0	96.4	1472
4320 min Winter	1.942	0.0	104.8	2196
5760 min Winter	1.544	0.0	111.1	2904
7200 min Winter	1.291	0.0	116.2	3640
8640 min Winter	1.116	0.0	120.4	4320
10080 min Winter	0.987	0.0	124.2	5120

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.360	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.075

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.025	4	8	0.025	8	12	0.025

Model Details

Storage is Online Cover Level (m) 75.300

Cellular Storage Structure

Invert Level (m) 74.100 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	72.0	72.0	0.500	0.0	93.6
0.400	72.0	93.6			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0089-3500-1000-3500
Design Head (m)	1.000
Design Flow (l/s)	3.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	89
Invert Level (m)	74.100
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	3.5
Flush-Flo™	0.300	3.5
Kick-Flo®	0.632	2.8
Mean Flow over Head Range	-	3.1

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	2.7	1.200	3.8	3.000	5.8	7.000	8.7
0.200	3.4	1.400	4.1	3.500	6.2	7.500	9.0
0.300	3.5	1.600	4.3	4.000	6.7	8.000	9.2
0.400	3.4	1.800	4.6	4.500	7.0	8.500	9.5
0.500	3.3	2.000	4.8	5.000	7.4	9.000	9.8
0.600	3.0	2.200	5.0	5.500	7.7	9.500	10.0
0.800	3.1	2.400	5.2	6.000	8.1		
1.000	3.5	2.600	5.4	6.500	8.4		