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

Half Drain Time : 275 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	98.415	0.415	0.0	2.0	2.0	33.5	O K
30 min Summer	98.526	0.526	0.0	2.0	2.0	42.5	O K
60 min Summer	98.620	0.620	0.0	2.0	2.0	50.0	O K
120 min Summer	98.678	0.678	0.0	2.0	2.0	54.8	O K
180 min Summer	98.684	0.684	0.0	2.0	2.0	55.2	O K
240 min Summer	98.670	0.670	0.0	2.0	2.0	54.1	O K
360 min Summer	98.639	0.639	0.0	2.0	2.0	51.6	O K
480 min Summer	98.608	0.608	0.0	2.0	2.0	49.1	O K
600 min Summer	98.579	0.579	0.0	2.0	2.0	46.7	O K
720 min Summer	98.549	0.549	0.0	2.0	2.0	44.3	O K
960 min Summer	98.486	0.486	0.0	2.0	2.0	39.2	O K
1440 min Summer	98.372	0.372	0.0	2.0	2.0	30.1	O K
2160 min Summer	98.249	0.249	0.0	2.0	2.0	20.1	O K
2880 min Summer	98.171	0.171	0.0	1.9	1.9	13.8	O K
4320 min Summer	98.098	0.098	0.0	1.8	1.8	7.9	O K
5760 min Summer	98.076	0.076	0.0	1.5	1.5	6.2	O K
7200 min Summer	98.065	0.065	0.0	1.2	1.2	5.2	O K
8640 min Summer	98.057	0.057	0.0	1.1	1.1	4.6	O K
10080 min Summer	98.052	0.052	0.0	0.9	0.9	4.2	O K
15 min Winter	98.467	0.467	0.0	2.0	2.0	37.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	149.442	0.0	34.8	18
30 min Summer	96.326	0.0	44.9	33
60 min Summer	59.033	0.0	55.3	62
120 min Summer	34.948	0.0	65.4	122
180 min Summer	25.392	0.0	71.3	180
240 min Summer	20.134	0.0	75.4	226
360 min Summer	14.493	0.0	81.4	284
480 min Summer	11.475	0.0	86.0	348
600 min Summer	9.568	0.0	89.6	416
720 min Summer	8.244	0.0	92.6	486
960 min Summer	6.513	0.0	97.6	618
1440 min Summer	4.667	0.0	104.9	866
2160 min Summer	3.339	0.0	112.6	1216
2880 min Summer	2.631	0.0	118.3	1556
4320 min Summer	1.878	0.0	126.6	2244
5760 min Summer	1.478	0.0	133.0	2936
7200 min Summer	1.226	0.0	137.9	3672
8640 min Summer	1.053	0.0	142.0	4400
10080 min Summer	0.925	0.0	145.6	5136
15 min Winter	149.442	0.0	39.0	18

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	98.593	0.593	0.0	2.0	2.0	47.9	O K
60 min Winter	98.700	0.700	0.0	2.0	2.0	56.5	O K
120 min Winter	98.772	0.772	0.0	2.0	2.0	62.3	O K
180 min Winter	98.784	0.784	0.0	2.0	2.0	63.3	O K
240 min Winter	98.774	0.774	0.0	2.0	2.0	62.5	O K
360 min Winter	98.734	0.734	0.0	2.0	2.0	59.3	O K
480 min Winter	98.697	0.697	0.0	2.0	2.0	56.2	O K
600 min Winter	98.657	0.657	0.0	2.0	2.0	53.0	O K
720 min Winter	98.616	0.616	0.0	2.0	2.0	49.8	O K
960 min Winter	98.532	0.532	0.0	2.0	2.0	43.0	O K
1440 min Winter	98.354	0.354	0.0	2.0	2.0	28.6	O K
2160 min Winter	98.188	0.188	0.0	2.0	2.0	15.2	O K
2880 min Winter	98.110	0.110	0.0	1.8	1.8	8.9	O K
4320 min Winter	98.071	0.071	0.0	1.4	1.4	5.8	O K
5760 min Winter	98.058	0.058	0.0	1.1	1.1	4.7	O K
7200 min Winter	98.051	0.051	0.0	0.9	0.9	4.1	O K
8640 min Winter	98.046	0.046	0.0	0.8	0.8	3.7	O K
10080 min Winter	98.043	0.043	0.0	0.7	0.7	3.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	96.326	0.0	50.4	33
60 min Winter	59.033	0.0	61.9	62
120 min Winter	34.948	0.0	73.3	120
180 min Winter	25.392	0.0	79.9	176
240 min Winter	20.134	0.0	84.5	230
360 min Winter	14.493	0.0	91.2	298
480 min Winter	11.475	0.0	96.3	370
600 min Winter	9.568	0.0	100.3	448
720 min Winter	8.244	0.0	103.8	526
960 min Winter	6.513	0.0	109.3	682
1440 min Winter	4.667	0.0	117.5	924
2160 min Winter	3.339	0.0	126.2	1256
2880 min Winter	2.631	0.0	132.5	1556
4320 min Winter	1.878	0.0	141.9	2208
5760 min Winter	1.478	0.0	148.9	2936
7200 min Winter	1.226	0.0	154.5	3672
8640 min Winter	1.053	0.0	159.1	4328
10080 min Winter	0.925	0.0	163.1	5128

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)	20.800	Shortest Storm (mins)	15
Ratio R	0.443	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.125

Time (mins) From:	To:	Area (ha)
0	4	0.125

Model Details

Storage is Online Cover Level (m) 100.000

Cellular Storage Structure

Invert Level (m) 98.000 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	85.0	85.0	0.900	0.0	114.6
0.800	85.0	114.6			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0070-2000-0800-2000
Design Head (m)	0.800
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	70
Invert Level (m)	98.000
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	2.0
Flush-Flo™	0.240	2.0
Kick-Flo®	0.504	1.6
Mean Flow over Head Range	-	1.7

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.8	1.200	2.4	3.000	3.7	7.000	5.5
0.200	2.0	1.400	2.6	3.500	3.9	7.500	5.6
0.300	2.0	1.600	2.7	4.000	4.2	8.000	5.8
0.400	1.9	1.800	2.9	4.500	4.4	8.500	6.0
0.500	1.6	2.000	3.0	5.000	4.7	9.000	6.2
0.600	1.8	2.200	3.2	5.500	4.9	9.500	6.3
0.800	2.0	2.400	3.3	6.000	5.1		
1.000	2.2	2.600	3.4	6.500	5.3		