Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 25 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	46.203	0.273	0.0	1.0	1.0	2.1	O K
30 min Summer	46.244	0.314	0.0	1.0	1.0	2.4	O K
60 min Summer	46.247	0.317	0.0	1.0	1.0	2.4	O K
120 min Summer	46.202	0.272	0.0	1.0	1.0	2.1	O K
180 min Summer	46.143	0.213	0.0	1.0	1.0	1.6	O K
240 min Summer	46.093	0.163	0.0	1.0	1.0	1.2	O K
360 min Summer	46.030	0.100	0.0	1.0	1.0	0.8	O K
480 min Summer	46.003	0.073	0.0	0.9	0.9	0.6	O K
600 min Summer	45.992	0.062	0.0	0.8	0.8	0.5	O K
720 min Summer	45.984	0.054	0.0	0.7	0.7	0.4	O K
960 min Summer	45.975	0.045	0.0	0.6	0.6	0.3	O K
1440 min Summer	45.967	0.037	0.0	0.4	0.4	0.3	O K
2160 min Summer	45.960	0.030	0.0	0.3	0.3	0.2	O K
2880 min Summer	45.957	0.027	0.0	0.3	0.3	0.2	O K
4320 min Summer	45.952	0.022	0.0	0.2	0.2	0.2	O K
5760 min Summer	45.950	0.020	0.0	0.1	0.1	0.1	O K
7200 min Summer	45.948	0.018	0.0	0.1	0.1	0.1	O K
8640 min Summer	45.946	0.016	0.0	0.1	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	144.532	0.0	2.7	16
30 min Summer	95.634	0.0	3.6	26
60 min Summer	60.244	0.0	4.5	44
120 min Summer	36.592	0.0	5.5	78
180 min Summer	26.927	0.0	6.1	110
240 min Summer	21.527	0.0	6.5	138
360 min Summer	15.725	0.0	7.1	194
480 min Summer	12.564	0.0	7.5	248
600 min Summer	10.549	0.0	7.9	308
720 min Summer	9.140	0.0	8.2	368
960 min Summer	7.284	0.0	8.7	490
1440 min Summer	5.280	0.0	9.5	734
2160 min Summer	3.821	0.0	10.3	1100
2880 min Summer	3.034	0.0	10.9	1460
4320 min Summer	2.188	0.0	11.8	2176
5760 min Summer	1.734	0.0	12.5	2888
7200 min Summer	1.446	0.0	13.0	3568
8640 min Summer	1.247	0.0	13.5	4360

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Summary of Results for 100 year Return Period (+45%)

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
10080 min Summer	45.945	0.015	0.0	0.1	0.1	0.1	O K
15 min Winter	46.242	0.312	0.0	1.0	1.0	2.4	O K
30 min Winter	46.289	0.359	0.0	1.0	1.0	2.7	O K
60 min Winter	46.288	0.358	0.0	1.0	1.0	2.7	O K
120 min Winter	46.218	0.288	0.0	1.0	1.0	2.2	O K
180 min Winter	46.123	0.193	0.0	1.0	1.0	1.5	O K
240 min Winter	46.053	0.123	0.0	1.0	1.0	0.9	O K
360 min Winter	45.999	0.069	0.0	0.9	0.9	0.5	O K
480 min Winter	45.985	0.055	0.0	0.7	0.7	0.4	O K
600 min Winter	45.977	0.047	0.0	0.6	0.6	0.4	O K
720 min Winter	45.972	0.042	0.0	0.5	0.5	0.3	O K
960 min Winter	45.967	0.037	0.0	0.4	0.4	0.3	O K
1440 min Winter	45.960	0.030	0.0	0.3	0.3	0.2	O K
2160 min Winter	45.955	0.025	0.0	0.2	0.2	0.2	O K
2880 min Winter	45.952	0.022	0.0	0.2	0.2	0.2	O K
4320 min Winter	45.949	0.019	0.0	0.1	0.1	0.1	O K
5760 min Winter	45.946	0.016	0.0	0.1	0.1	0.1	O K
7200 min Winter	45.945	0.015	0.0	0.1	0.1	0.1	O K
8640 min Winter	45.944	0.014	0.0	0.1	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	1.101	0.0	13.9	5088
15 min Winter	144.532	0.0	3.0	16
30 min Winter	95.634	0.0	4.0	29
60 min Winter	60.244	0.0	5.1	46
120 min Winter	36.592	0.0	6.1	84
180 min Winter	26.927	0.0	6.8	116
240 min Winter	21.527	0.0	7.2	142
360 min Winter	15.725	0.0	7.9	190
480 min Winter	12.564	0.0	8.4	250
600 min Winter	10.549	0.0	8.9	308
720 min Winter	9.140	0.0	9.2	370
960 min Winter	7.284	0.0	9.8	490
1440 min Winter	5.280	0.0	10.6	716
2160 min Winter	3.821	0.0	11.5	1092
2880 min Winter	3.034	0.0	12.2	1444
4320 min Winter	2.188	0.0	13.2	2204
5760 min Winter	1.734	0.0	14.0	2936
7200 min Winter	1.446	0.0	14.6	3672
8640 min Winter	1.247	0.0	15.1	4368

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Summary of Results for 100 year Return Period (+45%)

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
10080 min Winter	45.943	0.013	0.0	0.1	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	1.101	0.0	15.5	5104

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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)	20.500	Shortest Storm (mins)	15
Ratio R	0.381	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.010

Time (mins) From:	To:	Area (ha)
0	4	0.010

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Model Details

Storage is Online Cover Level (m) 46.830

Cellular Storage Structure

Invert Level (m) 45.930 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	8.0	0.0	0.401	0.0	0.0
0.400	8.0	0.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0055-1000-0400-1000
Design Head (m)	0.400
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	55
Invert Level (m)	45.930
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	1.0	Kick-Flo®	0.273	0.8
Flush-Flo™	0.117	1.0	Mean Flow over Head Range	-	0.9

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	1.0	1.200	1.6	3.000	2.5	7.000	3.8
0.200	1.0	1.400	1.8	3.500	2.7	7.500	3.9
0.300	0.9	1.600	1.9	4.000	2.8	8.000	4.0
0.400	1.0	1.800	2.0	4.500	3.0	8.500	4.1
0.500	1.1	2.000	2.1	5.000	3.2	9.000	4.3
0.600	1.2	2.200	2.2	5.500	3.3	9.500	4.4
0.800	1.4	2.400	2.2	6.000	3.5		
1.000	1.5	2.600	2.3	6.500	3.6		

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