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

Half Drain Time : 5 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	49.909	0.609	0.0	9.9	9.9	4.6	O K
30 min Summer	49.908	0.608	0.0	9.9	9.9	4.6	O K
60 min Summer	49.712	0.412	0.0	9.9	9.9	3.1	O K
120 min Summer	49.432	0.132	0.0	9.8	9.8	1.0	O K
180 min Summer	49.349	0.049	0.0	8.7	8.7	0.4	O K
240 min Summer	49.324	0.024	0.0	7.1	7.1	0.2	O K
360 min Summer	49.301	0.001	0.0	5.3	5.3	0.0	O K
480 min Summer	49.300	0.000	0.0	4.3	4.3	0.0	O K
600 min Summer	49.300	0.000	0.0	3.6	3.6	0.0	O K
720 min Summer	49.300	0.000	0.0	3.1	3.1	0.0	O K
960 min Summer	49.300	0.000	0.0	2.5	2.5	0.0	O K
1440 min Summer	49.300	0.000	0.0	1.8	1.8	0.0	O K
2160 min Summer	49.300	0.000	0.0	1.3	1.3	0.0	O K
2880 min Summer	49.300	0.000	0.0	1.0	1.0	0.0	O K
4320 min Summer	49.300	0.000	0.0	0.8	0.8	0.0	O K
5760 min Summer	49.300	0.000	0.0	0.6	0.6	0.0	O K
7200 min Summer	49.300	0.000	0.0	0.5	0.5	0.0	O K
8640 min Summer	49.300	0.000	0.0	0.4	0.4	0.0	O K
10080 min Summer	49.300	0.000	0.0	0.4	0.4	0.0	O K
15 min Winter	50.016	0.716	0.0	9.9	9.9	5.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	118.339	0.0	10.7	13
30 min Summer	78.700	0.0	14.4	22
60 min Summer	49.937	0.0	18.4	38
120 min Summer	30.626	0.0	22.5	66
180 min Summer	22.695	0.0	25.0	94
240 min Summer	18.231	0.0	26.8	124
360 min Summer	13.319	0.0	29.4	182
480 min Summer	10.663	0.0	31.3	0
600 min Summer	8.966	0.0	33.0	0
720 min Summer	7.778	0.0	34.3	0
960 min Summer	6.211	0.0	36.5	0
1440 min Summer	4.515	0.0	39.8	0
2160 min Summer	3.276	0.0	43.3	0
2880 min Summer	2.606	0.0	46.0	0
4320 min Summer	1.885	0.0	49.9	0
5760 min Summer	1.496	0.0	52.8	0
7200 min Summer	1.250	0.0	55.1	0
8640 min Summer	1.078	0.0	57.1	0
10080 min Summer	0.952	0.0	58.8	0
15 min Winter	118.339	0.0	12.1	14

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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	49.969	0.669	0.0	9.9	9.9	5.1	O K
60 min Winter	49.632	0.332	0.0	9.9	9.9	2.5	O K
120 min Winter	49.349	0.049	0.0	8.7	8.7	0.4	O K
180 min Winter	49.316	0.016	0.0	6.5	6.5	0.1	O K
240 min Winter	49.300	0.000	0.0	5.3	5.3	0.0	O K
360 min Winter	49.300	0.000	0.0	3.9	3.9	0.0	O K
480 min Winter	49.300	0.000	0.0	3.1	3.1	0.0	O K
600 min Winter	49.300	0.000	0.0	2.6	2.6	0.0	O K
720 min Winter	49.300	0.000	0.0	2.2	2.2	0.0	O K
960 min Winter	49.300	0.000	0.0	1.8	1.8	0.0	O K
1440 min Winter	49.300	0.000	0.0	1.3	1.3	0.0	O K
2160 min Winter	49.300	0.000	0.0	0.9	0.9	0.0	O K
2880 min Winter	49.300	0.000	0.0	0.8	0.8	0.0	O K
4320 min Winter	49.300	0.000	0.0	0.5	0.5	0.0	O K
5760 min Winter	49.300	0.000	0.0	0.4	0.4	0.0	O K
7200 min Winter	49.300	0.000	0.0	0.4	0.4	0.0	O K
8640 min Winter	49.300	0.000	0.0	0.3	0.3	0.0	O K
10080 min Winter	49.300	0.000	0.0	0.3	0.3	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	78.700	0.0	16.1	23
60 min Winter	49.937	0.0	20.5	38
120 min Winter	30.626	0.0	25.2	64
180 min Winter	22.695	0.0	28.0	94
240 min Winter	18.231	0.0	30.0	122
360 min Winter	13.319	0.0	32.9	0
480 min Winter	10.663	0.0	35.1	0
600 min Winter	8.966	0.0	36.9	0
720 min Winter	7.778	0.0	38.4	0
960 min Winter	6.211	0.0	40.9	0
1440 min Winter	4.515	0.0	44.6	0
2160 min Winter	3.276	0.0	48.5	0
2880 min Winter	2.606	0.0	51.5	0
4320 min Winter	1.885	0.0	55.9	0
5760 min Winter	1.496	0.0	59.1	0
7200 min Winter	1.250	0.0	61.7	0
8640 min Winter	1.078	0.0	63.9	0
10080 min Winter	0.952	0.0	65.8	0

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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)	19.000	Shortest Storm (mins)	15
Ratio R	0.373	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.049

Time (mins) From:	To:	Area (ha)
0	4	0.049

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Model Details

Storage is Online Cover Level (m) 50.800

Cellular Storage Structure

Invert Level (m) 49.300 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	8.0	0.900	0.0	17.6
0.800	8.0	17.6			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0146-1000-1000-1000
Design Head (m)	1.000
Design Flow (l/s)	10.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	146
Invert Level (m)	49.200
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	10.0
Flush-Flo™	0.306	9.9
Kick-Flo®	0.673	8.3
Mean Flow over Head Range	-	8.6

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	5.2	1.200	10.9	3.000	16.8	7.000	25.2
0.200	9.6	1.400	11.7	3.500	18.1	7.500	26.1
0.300	9.9	1.600	12.5	4.000	19.3	8.000	26.9
0.400	9.8	1.800	13.2	4.500	20.4	8.500	27.7
0.500	9.6	2.000	13.9	5.000	21.5	9.000	28.5
0.600	9.1	2.200	14.5	5.500	22.5	9.500	29.2
0.800	9.0	2.400	15.1	6.000	23.4		
1.000	10.0	2.600	15.7	6.500	24.4		

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