Summary of Results for 30 year Return Period

Half Drain Time : 331 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	0.024	0.024	0.0	0.4	0.4	18.3	O K
30 min Summer	0.031	0.031	0.0	0.6	0.6	23.2	O K
60 min Summer	0.037	0.037	0.0	0.9	0.9	27.6	O K
120 min Summer	0.041	0.041	0.0	1.1	1.1	31.0	O K
180 min Summer	0.043	0.043	0.0	1.2	1.2	32.1	O K
240 min Summer	0.043	0.043	0.0	1.2	1.2	32.5	O K
360 min Summer	0.044	0.044	0.0	1.2	1.2	33.0	O K
480 min Summer	0.044	0.044	0.0	1.2	1.2	33.2	O K
600 min Summer	0.044	0.044	0.0	1.3	1.3	33.2	O K
720 min Summer	0.044	0.044	0.0	1.2	1.2	33.1	O K
960 min Summer	0.043	0.043	0.0	1.2	1.2	32.6	O K
1440 min Summer	0.042	0.042	0.0	1.1	1.1	31.4	O K
2160 min Summer	0.039	0.039	0.0	1.0	1.0	29.5	O K
2880 min Summer	0.037	0.037	0.0	0.9	0.9	27.8	O K
4320 min Summer	0.033	0.033	0.0	0.7	0.7	25.2	O K
5760 min Summer	0.031	0.031	0.0	0.6	0.6	23.2	O K
7200 min Summer	0.029	0.029	0.0	0.6	0.6	21.7	O K
8640 min Summer	0.027	0.027	0.0	0.5	0.5	20.5	O K
10080 min Summer	0.026	0.026	0.0	0.4	0.4	19.4	O K
15 min Winter	0.027	0.027	0.0	0.5	0.5	20.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	80.412	0.0	12.2	26
30 min Summer	51.576	0.0	16.9	40
60 min Summer	31.593	0.0	25.0	68
120 min Summer	18.784	0.0	30.3	124
180 min Summer	13.717	0.0	33.6	180
240 min Summer	10.932	0.0	35.8	204
360 min Summer	7.920	0.0	39.2	264
480 min Summer	6.299	0.0	41.7	332
600 min Summer	5.271	0.0	43.7	398
720 min Summer	4.555	0.0	45.3	466
960 min Summer	3.617	0.0	47.9	600
1440 min Summer	2.610	0.0	51.4	866
2160 min Summer	1.882	0.0	59.5	1252
2880 min Summer	1.491	0.0	62.5	1624
4320 min Summer	1.073	0.0	66.3	2380
5760 min Summer	0.850	0.0	73.4	3112
7200 min Summer	0.709	0.0	76.2	3832
8640 min Summer	0.611	0.0	78.3	4584
10080 min Summer	0.539	0.0	79.6	5344
15 min Winter	80.412	0.0	14.2	26

Summary of Results for 30 year Return Period

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	0.034	0.034	0.0	0.8	0.8	25.9	O K
60 min Winter	0.041	0.041	0.0	1.1	1.1	30.8	O K
120 min Winter	0.046	0.046	0.0	1.3	1.3	34.6	O K
180 min Winter	0.047	0.047	0.0	1.4	1.4	35.8	O K
240 min Winter	0.048	0.048	0.0	1.4	1.4	36.0	O K
360 min Winter	0.048	0.048	0.0	1.5	1.5	36.4	O K
480 min Winter	0.048	0.048	0.0	1.5	1.5	36.3	O K
600 min Winter	0.048	0.048	0.0	1.4	1.4	35.9	O K
720 min Winter	0.047	0.047	0.0	1.4	1.4	35.4	O K
960 min Winter	0.045	0.045	0.0	1.3	1.3	34.3	O K
1440 min Winter	0.042	0.042	0.0	1.2	1.2	32.1	O K
2160 min Winter	0.039	0.039	0.0	1.0	1.0	29.3	O K
2880 min Winter	0.036	0.036	0.0	0.8	0.8	27.1	O K
4320 min Winter	0.032	0.032	0.0	0.7	0.7	23.9	O K
5760 min Winter	0.029	0.029	0.0	0.6	0.6	21.6	O K
7200 min Winter	0.026	0.026	0.0	0.5	0.5	20.0	O K
8640 min Winter	0.025	0.025	0.0	0.4	0.4	18.6	O K
10080 min Winter	0.023	0.023	0.0	0.4	0.4	17.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	51.576	0.0	19.5	40
60 min Winter	31.593	0.0	28.4	66
120 min Winter	18.784	0.0	34.4	122
180 min Winter	13.717	0.0	38.0	176
240 min Winter	10.932	0.0	40.6	202
360 min Winter	7.920	0.0	44.4	274
480 min Winter	6.299	0.0	47.2	350
600 min Winter	5.271	0.0	49.4	422
720 min Winter	4.555	0.0	51.3	496
960 min Winter	3.617	0.0	54.2	638
1440 min Winter	2.610	0.0	58.2	912
2160 min Winter	1.882	0.0	66.9	1304
2880 min Winter	1.491	0.0	70.4	1700
4320 min Winter	1.073	0.0	74.8	2428
5760 min Winter	0.850	0.0	82.4	3176
7200 min Winter	0.709	0.0	85.6	3968
8640 min Winter	0.611	0.0	88.0	4672
10080 min Winter	0.539	0.0	89.6	5448

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.500	Shortest Storm (mins)	15
Ratio R	0.437	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.123

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.041	4	8	0.041	8	12	0.041

Model Details

Storage is Online Cover Level (m) 0.085

Cellular Storage Structure

Invert Level (m) 0.000 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	795.0	0.0	0.085	795.0	0.0

Hydro-Brake Optimum® Outflow Control

Unit Reference	MD-SHE-0146-9000-0400-9000
Design Head (m)	0.400
Design Flow (l/s)	9.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Diameter (mm)	146
Invert Level (m)	0.000
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	9.0
Flush-Flo™	0.209	8.9
Kick-Flo®	0.333	8.2
Mean Flow over Head Range	-	6.8

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	5.3	1.200	15.1	3.000	23.3	7.000	35.3
0.200	8.9	1.400	16.2	3.500	25.1	7.500	36.5
0.300	8.6	1.600	17.3	4.000	26.8	8.000	37.7
0.400	9.0	1.800	18.3	4.500	28.2	8.500	38.9
0.500	9.9	2.000	19.2	5.000	29.8	9.000	40.1
0.600	10.8	2.200	20.1	5.500	31.2	9.500	41.2
0.800	12.4	2.400	21.0	6.000	32.6		
1.000	13.8	2.600	21.8	6.500	34.0		