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

Half Drain Time : 229 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	0.041	0.041	0.0	1.1	1.1	30.7	O K
30 min Summer	0.051	0.051	0.0	1.7	1.7	38.8	O K
60 min Summer	0.061	0.061	0.0	2.3	2.3	45.9	Flood Risk
120 min Summer	0.067	0.067	0.0	2.7	2.7	50.2	Flood Risk
180 min Summer	0.068	0.068	0.0	2.7	2.7	51.2	Flood Risk
240 min Summer	0.068	0.068	0.0	2.8	2.8	51.7	Flood Risk
360 min Summer	0.069	0.069	0.0	2.8	2.8	51.9	Flood Risk
480 min Summer	0.068	0.068	0.0	2.8	2.8	51.6	Flood Risk
600 min Summer	0.068	0.068	0.0	2.7	2.7	51.0	Flood Risk
720 min Summer	0.067	0.067	0.0	2.7	2.7	50.3	Flood Risk
960 min Summer	0.064	0.064	0.0	2.5	2.5	48.7	Flood Risk
1440 min Summer	0.060	0.060	0.0	2.2	2.2	45.6	Flood Risk
2160 min Summer	0.055	0.055	0.0	1.9	1.9	41.7	O K
2880 min Summer	0.051	0.051	0.0	1.7	1.7	38.6	O K
4320 min Summer	0.045	0.045	0.0	1.3	1.3	34.2	O K
5760 min Summer	0.041	0.041	0.0	1.1	1.1	31.1	O K
7200 min Summer	0.038	0.038	0.0	1.0	1.0	28.8	O K
8640 min Summer	0.036	0.036	0.0	0.8	0.8	27.0	O K
10080 min Summer	0.034	0.034	0.0	0.8	0.8	25.5	O K
15 min Winter	0.045	0.045	0.0	1.3	1.3	34.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	135.934	0.0	23.9	26
30 min Summer	87.857	0.0	32.6	39
60 min Summer	54.012	0.0	45.4	66
120 min Summer	32.082	0.0	54.6	120
180 min Summer	23.356	0.0	60.0	150
240 min Summer	18.546	0.0	63.7	180
360 min Summer	13.362	0.0	69.1	246
480 min Summer	10.589	0.0	73.1	314
600 min Summer	8.835	0.0	76.3	382
720 min Summer	7.617	0.0	78.9	448
960 min Summer	6.024	0.0	83.1	582
1440 min Summer	4.321	0.0	88.8	840
2160 min Summer	3.096	0.0	99.6	1216
2880 min Summer	2.441	0.0	104.4	1588
4320 min Summer	1.745	0.0	110.5	2336
5760 min Summer	1.374	0.0	119.7	3064
7200 min Summer	1.141	0.0	123.9	3816
8640 min Summer	0.980	0.0	127.1	4504
10080 min Summer	0.861	0.0	129.1	5248
15 min Winter	135.934	0.0	27.5	26

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	0.057	0.057	0.0	2.0	2.0	43.4	O K
60 min Winter	0.068	0.068	0.0	2.7	2.7	51.2	Flood Risk
120 min Winter	0.074	0.074	0.0	3.2	3.2	56.0	Flood Risk
180 min Winter	0.075	0.075	0.0	3.3	3.3	56.9	Flood Risk
240 min Winter	0.076	0.076	0.0	3.3	3.3	57.1	Flood Risk
360 min Winter	0.075	0.075	0.0	3.3	3.3	56.5	Flood Risk
480 min Winter	0.073	0.073	0.0	3.1	3.1	55.3	Flood Risk
600 min Winter	0.071	0.071	0.0	3.0	3.0	54.0	Flood Risk
720 min Winter	0.070	0.070	0.0	2.9	2.9	52.6	Flood Risk
960 min Winter	0.066	0.066	0.0	2.6	2.6	49.9	Flood Risk
1440 min Winter	0.060	0.060	0.0	2.2	2.2	45.4	Flood Risk
2160 min Winter	0.053	0.053	0.0	1.8	1.8	40.3	O K
2880 min Winter	0.049	0.049	0.0	1.5	1.5	36.7	O K
4320 min Winter	0.042	0.042	0.0	1.1	1.1	31.7	O K
5760 min Winter	0.038	0.038	0.0	0.9	0.9	28.3	O K
7200 min Winter	0.034	0.034	0.0	0.8	0.8	26.0	O K
8640 min Winter	0.032	0.032	0.0	0.7	0.7	24.2	O K
10080 min Winter	0.030	0.030	0.0	0.6	0.6	22.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	87.857	0.0	37.2	39
60 min Winter	54.012	0.0	51.3	66
120 min Winter	32.082	0.0	61.7	118
180 min Winter	23.356	0.0	67.7	150
240 min Winter	18.546	0.0	71.8	186
360 min Winter	13.362	0.0	77.9	262
480 min Winter	10.589	0.0	82.4	334
600 min Winter	8.835	0.0	86.0	406
720 min Winter	7.617	0.0	89.0	476
960 min Winter	6.024	0.0	93.7	612
1440 min Winter	4.321	0.0	100.2	874
2160 min Winter	3.096	0.0	112.0	1264
2880 min Winter	2.441	0.0	117.4	1644
4320 min Winter	1.745	0.0	124.3	2388
5760 min Winter	1.374	0.0	134.3	3112
7200 min Winter	1.141	0.0	139.1	3896
8640 min Winter	0.980	0.0	142.7	4664
10080 min Winter	0.861	0.0	145.1	5328

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	0.437	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

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		