Summary of Results for 10 year Return Period

Half Drain Time : 161 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	74.982	1.232	0.0	47.1	47.1	554.4	O K
30 min Summer	75.137	1.387	0.0	49.8	49.8	686.3	O K
60 min Summer	75.275	1.525	0.0	52.1	52.1	786.8	O K
120 min Summer	75.330	1.580	0.0	53.0	53.0	824.0	O K
180 min Summer	75.310	1.560	0.0	52.6	52.6	810.0	O K
240 min Summer	75.275	1.525	0.0	52.1	52.1	786.8	O K
360 min Summer	75.208	1.458	0.0	51.0	51.0	737.0	O K
480 min Summer	75.146	1.396	0.0	50.0	50.0	692.9	O K
600 min Summer	75.098	1.348	0.0	49.2	49.2	651.7	O K
720 min Summer	75.052	1.302	0.0	48.4	48.4	612.4	O K
960 min Summer	74.965	1.215	0.0	46.8	46.8	539.5	O K
1440 min Summer	74.816	1.066	0.0	44.1	44.1	415.0	O K
2160 min Summer	74.641	0.891	0.0	40.6	40.6	275.7	O K
2880 min Summer	74.493	0.743	0.0	37.4	37.4	181.7	O K
4320 min Summer	74.243	0.493	0.0	31.2	31.2	72.6	O K
5760 min Summer	73.953	0.203	0.0	29.4	29.4	10.9	O K
7200 min Summer	73.901	0.151	0.0	25.0	25.0	5.9	O K
8640 min Summer	73.881	0.131	0.0	21.6	21.6	4.4	O K
10080 min Summer	73.867	0.117	0.0	19.1	19.1	3.5	O K
15 min Winter	75.068	1.318	0.0	48.6	48.6	625.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	61.324	0.0	602.5	21
30 min Summer	39.180	0.0	769.9	35
60 min Summer	24.003	0.0	943.4	64
120 min Summer	14.335	0.0	1126.8	120
180 min Summer	10.522	0.0	1240.7	148
240 min Summer	8.426	0.0	1324.8	180
360 min Summer	6.146	0.0	1449.3	248
480 min Summer	4.911	0.0	1544.1	318
600 min Summer	4.125	0.0	1621.1	386
720 min Summer	3.576	0.0	1686.4	454
960 min Summer	2.853	0.0	1794.3	586
1440 min Summer	2.074	0.0	1956.6	840
2160 min Summer	1.507	0.0	2132.3	1208
2880 min Summer	1.201	0.0	2265.7	1560
4320 min Summer	0.872	0.0	2466.9	2288
5760 min Summer	0.694	0.0	2619.0	2936
7200 min Summer	0.582	0.0	2741.3	3640
8640 min Summer	0.504	0.0	2849.6	4320
10080 min Summer	0.446	0.0	2941.1	5000
15 min Winter	61.324	0.0	674.9	21

Summary of Results for 10 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	75.263	1.513	0.0	51.9	51.9	777.9	O K
60 min Winter	75.447	1.697	0.0	54.8	54.8	898.3	O K
120 min Winter	75.553	1.803	0.0	56.4	56.4	955.7	Flood Risk
180 min Winter	75.523	1.773	0.0	55.9	55.9	940.7	O K
240 min Winter	75.479	1.729	0.0	55.2	55.2	916.1	O K
360 min Winter	75.367	1.617	0.0	53.5	53.5	850.2	O K
480 min Winter	75.270	1.520	0.0	52.0	52.0	783.0	O K
600 min Winter	75.187	1.437	0.0	50.7	50.7	721.8	O K
720 min Winter	75.110	1.360	0.0	49.4	49.4	662.9	O K
960 min Winter	74.982	1.232	0.0	47.2	47.2	554.5	O K
1440 min Winter	74.771	1.021	0.0	43.2	43.2	377.3	O K
2160 min Winter	74.525	0.775	0.0	38.1	38.1	200.3	O K
2880 min Winter	74.318	0.568	0.0	33.2	33.2	99.6	O K
4320 min Winter	73.915	0.165	0.0	27.0	27.0	7.0	O K
5760 min Winter	73.881	0.131	0.0	21.5	21.5	4.4	O K
7200 min Winter	73.861	0.111	0.0	18.1	18.1	3.1	O K
8640 min Winter	73.847	0.097	0.0	15.6	15.6	2.4	O K
10080 min Winter	73.837	0.087	0.0	13.8	13.8	1.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	39.180	0.0	862.2	35
60 min Winter	24.003	0.0	1056.6	62
120 min Winter	14.335	0.0	1261.9	118
180 min Winter	10.522	0.0	1389.3	166
240 min Winter	8.426	0.0	1483.6	190
360 min Winter	6.146	0.0	1623.2	268
480 min Winter	4.911	0.0	1729.3	344
600 min Winter	4.125	0.0	1815.6	416
720 min Winter	3.576	0.0	1888.8	488
960 min Winter	2.853	0.0	2009.4	626
1440 min Winter	2.074	0.0	2191.3	884
2160 min Winter	1.507	0.0	2388.0	1240
2880 min Winter	1.201	0.0	2537.5	1592
4320 min Winter	0.872	0.0	2762.9	2196
5760 min Winter	0.694	0.0	2933.2	2888
7200 min Winter	0.582	0.0	3073.7	3648
8640 min Winter	0.504	0.0	3191.3	4256
10080 min Winter	0.446	0.0	3293.7	5032

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	10	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.429	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 5.240

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	2.620	4	8	2.620

Model Details

Storage is Online Cover Level (m) 75.850

Swale Structure

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	155.0
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	120.0
Porosity	1.00	Cap Volume Depth (m)	1.000
Invert Level (m)	73.750	Cap Infiltration Depth (m)	0.000
Base Width (m)	4.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0243-3000-0500-3000
Design Head (m)	0.500
Design Flow (l/s)	30.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	243
Invert Level (m)	73.700
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.500	30.0
Flush-Flo™	0.324	30.0
Kick-Flo®	0.451	28.6
Mean Flow over Head Range	-	21.4

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	8.0	1.200	45.7	3.000	71.2	7.000	107.1
0.200	24.8	1.400	49.2	3.500	76.7	7.500	111.0
0.300	29.9	1.600	52.5	4.000	81.9	8.000	114.6
0.400	29.5	1.800	55.6	4.500	86.7	8.500	118.2
0.500	30.0	2.000	58.5	5.000	91.3	9.000	121.7
0.600	32.7	2.200	61.2	5.500	94.7	9.500	125.1
0.800	37.6	2.400	63.9	6.000	99.0		
1.000	41.8	2.600	66.4	6.500	103.2		