Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	100.915	0.715	2.8	108.3	O K
30 min Summer	101.081	0.881	2.8	146.6	O K
60 min Summer	101.257	1.057	2.8	187.9	O K
120 min Summer	101.436	1.236	2.9	228.9	O K
180 min Summer	101.531	1.331	3.0	250.0	O K
240 min Summer	101.587	1.387	3.1	261.6	O K
360 min Summer	101.653	1.453	3.2	275.1	O K
480 min Summer	101.681	1.481	3.2	280.5	O K
600 min Summer	101.685	1.485	3.2	281.3	O K
720 min Summer	101.675	1.475	3.2	279.4	O K
960 min Summer	101.649	1.449	3.2	274.2	O K
1440 min Summer	101.594	1.394	3.1	263.2	O K
2160 min Summer	101.522	1.322	3.0	248.0	O K
2880 min Summer	101.454	1.254	3.0	232.9	O K
4320 min Summer	101.323	1.123	2.8	203.3	O K
5760 min Summer	101.204	1.004	2.8	175.6	O K
7200 min Summer	101.096	0.896	2.8	150.1	O K
8640 min Summer	100.990	0.790	2.8	125.4	O K
10080 min Summer	100.858	0.658	2.8	95.7	O K
15 min Winter	100.973	0.773	2.8	121.7	O K
30 min Winter	101.158	0.958	2.8	164.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	120.783	0.0	111.0	19
30 min Summer	82.448	0.0	151.5	34
60 min Summer	53.779	0.0	197.6	64
120 min Summer	33.839	0.0	248.7	122
180 min Summer	25.385	0.0	279.9	182
240 min Summer	20.527	0.0	301.7	242
360 min Summer	15.230	0.0	335.8	362
480 min Summer	12.303	0.0	361.7	480
600 min Summer	10.416	0.0	382.8	600
720 min Summer	9.085	0.0	400.7	686
960 min Summer	7.315	0.0	430.1	800
1440 min Summer	5.378	0.0	458.9	1054
2160 min Summer	3.943	0.0	521.7	1472
2880 min Summer	3.159	0.0	557.3	1876
4320 min Summer	2.307	0.0	610.4	2720
5760 min Summer	1.845	0.0	650.8	3520
7200 min Summer	1.553	0.0	684.7	4328
8640 min Summer	1.349	0.0	713.8	5104
10080 min Summer	1.198	0.0	739.4	5848
15 min Winter	120.783	0.0	124.3	19
30 min Winter	82.448	0.0	169.7	33

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	101.359	1.159	2.9	211.7	O K
120 min Winter	101.574	1.374	3.1	259.0	O K
180 min Winter	101.698	1.498	3.2	283.8	O K
240 min Winter	101.777	1.577	3.3	298.1	O K
360 min Winter	101.889	1.689	3.4	315.6	O K
480 min Winter	101.957	1.757	3.5	324.1	O K
600 min Winter	101.989	1.789	3.5	327.4	O K
720 min Winter	101.991	1.791	3.5	327.5	O K
960 min Winter	101.941	1.741	3.4	322.3	O K
1440 min Winter	101.840	1.640	3.3	308.3	O K
2160 min Winter	101.711	1.511	3.2	286.3	O K
2880 min Winter	101.597	1.397	3.1	263.7	O K
4320 min Winter	101.390	1.190	2.9	218.7	O K
5760 min Winter	101.209	1.009	2.8	176.8	O K
7200 min Winter	101.040	0.840	2.8	137.2	O K
8640 min Winter	100.815	0.615	2.8	86.3	O K
10080 min Winter	100.629	0.429	2.8	48.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	53.779	0.0	221.4	62
120 min Winter	33.839	0.0	278.6	122
180 min Winter	25.385	0.0	313.4	180
240 min Winter	20.527	0.0	338.0	238
360 min Winter	15.230	0.0	376.1	354
480 min Winter	12.303	0.0	405.1	468
600 min Winter	10.416	0.0	428.7	578
720 min Winter	9.085	0.0	448.7	686
960 min Winter	7.315	0.0	481.1	892
1440 min Winter	5.378	0.0	474.4	1112
2160 min Winter	3.943	0.0	584.3	1580
2880 min Winter	3.159	0.0	624.2	2044
4320 min Winter	2.307	0.0	683.6	2936
5760 min Winter	1.845	0.0	728.9	3800
7200 min Winter	1.553	0.0	766.9	4616
8640 min Winter	1.349	0.0	799.4	5360
10080 min Winter	1.198	0.0	828.1	5848

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	0.320	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.490

Time (mins) From:	To:	Area (ha)
0	4	0.490

Model Details

Storage is Online Cover Level (m) 102.800

Pipe Structure

Diameter (m) 1.800 Length (m) 130.000
Slope (1:X) 1000.000 Invert Level (m) 100.200

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0078-3500-1800-3500
Design Head (m)	1.800
Design Flow (l/s)	3.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	78
Invert Level (m)	100.200
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.800	3.5
Flush-Flo™	0.340	2.8
Kick-Flo®	0.695	2.3
Mean Flow over Head Range	-	2.7

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	2.2	1.200	2.9	3.000	4.4	7.000	6.6
0.200	2.7	1.400	3.1	3.500	4.8	7.500	6.8
0.300	2.8	1.600	3.3	4.000	5.1	8.000	7.0
0.400	2.8	1.800	3.5	4.500	5.4	8.500	7.2
0.500	2.7	2.000	3.7	5.000	5.6	9.000	7.4
0.600	2.6	2.200	3.8	5.500	5.9	9.500	7.6
0.800	2.4	2.400	4.0	6.000	6.1		
1.000	2.7	2.600	4.1	6.500	6.4		