Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	10.0	1.000	10.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0020-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	0.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	20
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	0.2	Kick-Flo®	0.175	0.1
Flush-Flo™	0.084	0.1	Mean Flow over Head Range	-	0.1

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)	Depth (m)	Flow (l/s)
0.100	0.1	0.800	0.2	2.000	0.3	4.000	0.4	7.000	0.5
0.200	0.1	1.000	0.2	2.200	0.3	4.500	0.4	7.500	0.5
0.300	0.1	1.200	0.2	2.400	0.3	5.000	0.4	8.000	0.5
0.400	0.1	1.400	0.2	2.600	0.3	5.500	0.4	8.500	0.5
0.500	0.1	1.600	0.2	3.000	0.3	6.000	0.4	9.000	0.5
0.600	0.2	1.800	0.3	3.500	0.3	6.500	0.4	9.500	0.5

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	9.228	0.228	1.4	136.6	O K
30 min Summer	9.298	0.298	1.4	178.8	O K
60 min Summer	9.370	0.370	1.4	222.3	O K
120 min Summer	9.443	0.443	1.4	265.6	O K
180 min Summer	9.483	0.483	1.4	289.8	O K
240 min Summer	9.510	0.510	1.4	305.7	O K
360 min Summer	9.546	0.546	1.4	327.6	O K
480 min Summer	9.570	0.570	1.4	342.3	O K
600 min Summer	9.588	0.588	1.4	352.6	O K
720 min Summer	9.600	0.600	1.4	360.1	O K
960 min Summer	9.616	0.616	1.4	369.6	O K
1440 min Summer	9.627	0.627	1.4	376.2	O K
2160 min Summer	9.618	0.618	1.4	371.1	O K
2880 min Summer	9.600	0.600	1.4	360.2	O K
4320 min Summer	9.565	0.565	1.4	338.7	O K
5760 min Summer	9.529	0.529	1.4	317.3	O K
7200 min Summer	9.490	0.490	1.4	293.8	O K
8640 min Summer	9.453	0.453	1.4	271.9	O K
10080 min Summer	9.420	0.420	1.4	252.0	O K
15 min Winter	9.255	0.255	1.4	153.1	O K
30 min Winter	9.334	0.334	1.4	200.4	O K
60 min Winter	9.415	0.415	1.4	249.3	O K
120 min Winter	9.497	0.497	1.4	298.3	O K
180 min Winter	9.543	0.543	1.4	326.0	O K
240 min Winter	9.574	0.574	1.4	344.1	O K
360 min Winter	9.615	0.615	1.4	368.9	O K
480 min Winter	9.643	0.643	1.4	385.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	104.8	19
30 min Summer	90.705	0.0	114.2	34
60 min Summer	56.713	0.0	205.0	64
120 min Summer	34.246	0.0	224.4	124
180 min Summer	25.149	0.0	224.3	184
240 min Summer	20.078	0.0	221.2	244
360 min Summer	14.585	0.0	214.2	364
480 min Summer	11.622	0.0	208.7	482
600 min Summer	9.738	0.0	204.5	602
720 min Summer	8.424	0.0	201.0	722
960 min Summer	6.697	0.0	195.4	962
1440 min Summer	4.839	0.0	187.3	1442
2160 min Summer	3.490	0.0	403.6	2160
2880 min Summer	2.766	0.0	388.8	2504
4320 min Summer	1.989	0.0	356.0	3244
5760 min Summer	1.573	0.0	596.4	4040
7200 min Summer	1.311	0.0	620.0	4824
8640 min Summer	1.129	0.0	638.5	5544
10080 min Summer	0.994	0.0	651.2	6352
15 min Winter	138.153	0.0	110.4	19
30 min Winter	90.705	0.0	115.7	34
60 min Winter	56.713	0.0	220.1	64
120 min Winter	34.246	0.0	224.7	122
180 min Winter	25.149	0.0	218.8	182
240 min Winter	20.078	0.0	214.3	240
360 min Winter	14.585	0.0	208.2	358
480 min Winter	11.622	0.0	204.2	478

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
600 min Winter	9.663	0.663	1.4	398.1	O K
720 min Winter	9.678	0.678	1.4	407.1	O K
960 min Winter	9.698	0.698	1.4	419.0	O K
1440 min Winter	9.715	0.715	1.4	429.0	Flood Risk
2160 min Winter	9.712	0.712	1.4	427.5	Flood Risk
2880 min Winter	9.695	0.695	1.4	416.9	O K
4320 min Winter	9.649	0.649	1.4	389.3	O K
5760 min Winter	9.604	0.604	1.4	362.4	O K
7200 min Winter	9.557	0.557	1.4	334.0	O K
8640 min Winter	9.503	0.503	1.4	301.9	O K
10080 min Winter	9.448	0.448	1.4	269.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	201.3	596
720 min Winter	8.424	0.0	199.2	712
960 min Winter	6.697	0.0	196.5	944
1440 min Winter	4.839	0.0	194.9	1400
2160 min Winter	3.490	0.0	405.7	2076
2880 min Winter	2.766	0.0	392.5	2712
4320 min Winter	1.989	0.0	366.5	3416
5760 min Winter	1.573	0.0	666.7	4328
7200 min Winter	1.311	0.0	690.8	5264
8640 min Winter	1.129	0.0	708.4	6144
10080 min Winter	0.994	0.0	715.2	6952

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.531

Time (mins) From:	To:	Area (ha)
0	4	0.531

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	1.000	600.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0058-1500-1000-1500
Design Head (m)	1.000
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5	Kick-Flo®	0.515	1.1
Flush-Flo™	0.253	1.4	Mean Flow over Head Range	-	1.2

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)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.4	2.000	2.0	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.1	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.9
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.3	8.500	4.0
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.1
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.5	9.500	4.2

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	9.222	0.222	1.4	133.5	O K
30 min Summer	9.291	0.291	1.4	174.7	O K
60 min Summer	9.362	0.362	1.4	217.2	O K
120 min Summer	9.432	0.432	1.4	259.4	O K
180 min Summer	9.472	0.472	1.4	283.0	O K
240 min Summer	9.497	0.497	1.4	298.5	O K
360 min Summer	9.533	0.533	1.4	319.7	O K
480 min Summer	9.557	0.557	1.4	334.0	O K
600 min Summer	9.573	0.573	1.4	344.1	O K
720 min Summer	9.586	0.586	1.4	351.3	O K
960 min Summer	9.601	0.601	1.4	360.4	O K
1440 min Summer	9.611	0.611	1.4	366.5	O K
2160 min Summer	9.602	0.602	1.4	360.9	O K
2880 min Summer	9.583	0.583	1.4	350.1	O K
4320 min Summer	9.547	0.547	1.4	328.5	O K
5760 min Summer	9.510	0.510	1.4	305.9	O K
7200 min Summer	9.471	0.471	1.4	282.6	O K
8640 min Summer	9.436	0.436	1.4	261.6	O K
10080 min Summer	9.403	0.403	1.4	242.1	O K
15 min Winter	9.249	0.249	1.4	149.6	O K
30 min Winter	9.326	0.326	1.4	195.8	O K
60 min Winter	9.406	0.406	1.4	243.6	O K
120 min Winter	9.486	0.486	1.4	291.4	O K
180 min Winter	9.531	0.531	1.4	318.4	O K
240 min Winter	9.560	0.560	1.4	336.1	O K
360 min Winter	9.600	0.600	1.4	360.2	O K
480 min Winter	9.628	0.628	1.4	376.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	103.4	19
30 min Summer	90.705	0.0	113.8	34
60 min Summer	56.713	0.0	201.4	64
120 min Summer	34.246	0.0	223.4	124
180 min Summer	25.149	0.0	224.5	184
240 min Summer	20.078	0.0	222.3	244
360 min Summer	14.585	0.0	215.7	364
480 min Summer	11.622	0.0	210.1	482
600 min Summer	9.738	0.0	205.7	602
720 min Summer	8.424	0.0	202.0	722
960 min Summer	6.697	0.0	195.9	962
1440 min Summer	4.839	0.0	186.9	1442
2160 min Summer	3.490	0.0	403.4	2160
2880 min Summer	2.766	0.0	388.8	2480
4320 min Summer	1.989	0.0	355.7	3240
5760 min Summer	1.573	0.0	583.2	4032
7200 min Summer	1.311	0.0	606.4	4760
8640 min Summer	1.129	0.0	624.7	5536
10080 min Summer	0.994	0.0	638.0	6352
15 min Winter	138.153	0.0	109.5	19
30 min Winter	90.705	0.0	115.5	34
60 min Winter	56.713	0.0	217.6	64
120 min Winter	34.246	0.0	225.3	122
180 min Winter	25.149	0.0	220.2	182
240 min Winter	20.078	0.0	215.6	240
360 min Winter	14.585	0.0	209.2	358
480 min Winter	11.622	0.0	204.9	476

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
600 min Winter	9.647	0.647	1.4	388.5	O K
720 min Winter	9.662	0.662	1.4	397.2	O K
960 min Winter	9.681	0.681	1.4	408.6	O K
1440 min Winter	9.697	0.697	1.4	418.0	O K
2160 min Winter	9.693	0.693	1.4	416.0	O K
2880 min Winter	9.675	0.675	1.4	405.1	O K
4320 min Winter	9.629	0.629	1.4	377.5	O K
5760 min Winter	9.584	0.584	1.4	350.4	O K
7200 min Winter	9.535	0.535	1.4	321.3	O K
8640 min Winter	9.479	0.479	1.4	287.5	O K
10080 min Winter	9.427	0.427	1.4	256.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	201.7	596
720 min Winter	8.424	0.0	199.3	712
960 min Winter	6.697	0.0	195.8	944
1440 min Winter	4.839	0.0	192.9	1400
2160 min Winter	3.490	0.0	405.4	2076
2880 min Winter	2.766	0.0	391.8	2708
4320 min Winter	1.989	0.0	364.7	3412
5760 min Winter	1.573	0.0	652.0	4328
7200 min Winter	1.311	0.0	676.4	5264
8640 min Winter	1.129	0.0	695.7	6128
10080 min Winter	0.994	0.0	706.0	6864

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.519

Time (mins) From:	To:	Area (ha)
0	4	0.519

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	1.000	600.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0058-1500-1000-1500
Design Head (m)	1.000
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5	Kick-Flo®	0.515	1.1
Flush-Flo™	0.253	1.4	Mean Flow over Head Range	-	1.2

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)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.4	2.000	2.0	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.1	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.9
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.3	8.500	4.0
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.1
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.5	9.500	4.2

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	9.274	0.274	1.1	54.9	O K
30 min Summer	9.358	0.358	1.1	71.5	O K
60 min Summer	9.442	0.442	1.1	88.4	O K
120 min Summer	9.523	0.523	1.1	104.5	O K
180 min Summer	9.563	0.563	1.1	112.7	O K
240 min Summer	9.587	0.587	1.1	117.4	O K
360 min Summer	9.614	0.614	1.1	122.8	O K
480 min Summer	9.626	0.626	1.1	125.3	O K
600 min Summer	9.630	0.630	1.1	126.1	O K
720 min Summer	9.629	0.629	1.1	125.9	O K
960 min Summer	9.618	0.618	1.1	123.6	O K
1440 min Summer	9.591	0.591	1.1	118.2	O K
2160 min Summer	9.550	0.550	1.1	110.1	O K
2880 min Summer	9.510	0.510	1.1	102.0	O K
4320 min Summer	9.424	0.424	1.1	84.8	O K
5760 min Summer	9.350	0.350	1.1	70.0	O K
7200 min Summer	9.289	0.289	1.1	57.7	O K
8640 min Summer	9.238	0.238	1.1	47.5	O K
10080 min Summer	9.197	0.197	1.1	39.4	O K
15 min Winter	9.308	0.308	1.1	61.5	O K
30 min Winter	9.402	0.402	1.1	80.3	O K
60 min Winter	9.497	0.497	1.1	99.4	O K
120 min Winter	9.588	0.588	1.1	117.6	O K
180 min Winter	9.635	0.635	1.1	127.0	O K
240 min Winter	9.663	0.663	1.1	132.6	O K
360 min Winter	9.696	0.696	1.1	139.1	O K
480 min Winter	9.713	0.713	1.1	142.5	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	53.6	19
30 min Summer	90.705	0.0	70.1	34
60 min Summer	56.713	0.0	90.5	64
120 min Summer	34.246	0.0	109.2	124
180 min Summer	25.149	0.0	120.2	182
240 min Summer	20.078	0.0	127.9	242
360 min Summer	14.585	0.0	139.0	362
480 min Summer	11.622	0.0	147.4	482
600 min Summer	9.738	0.0	153.8	600
720 min Summer	8.424	0.0	159.0	720
960 min Summer	6.697	0.0	165.7	912
1440 min Summer	4.839	0.0	164.3	1138
2160 min Summer	3.490	0.0	201.9	1532
2880 min Summer	2.766	0.0	213.2	1956
4320 min Summer	1.989	0.0	229.7	2724
5760 min Summer	1.573	0.0	243.3	3464
7200 min Summer	1.311	0.0	253.3	4184
8640 min Summer	1.129	0.0	261.5	4920
10080 min Summer	0.994	0.0	268.4	5552
15 min Winter	138.153	0.0	60.0	19
30 min Winter	90.705	0.0	77.9	33
60 min Winter	56.713	0.0	101.3	64
120 min Winter	34.246	0.0	122.2	122
180 min Winter	25.149	0.0	134.4	180
240 min Winter	20.078	0.0	142.9	238
360 min Winter	14.585	0.0	155.1	356
480 min Winter	11.622	0.0	163.8	472

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
600 min Winter	9.720	0.720	1.1	144.1	Flood Risk
720 min Winter	9.722	0.722	1.1	144.4	Flood Risk
960 min Winter	9.715	0.715	1.1	142.9	Flood Risk
1440 min Winter	9.680	0.680	1.1	136.0	O K
2160 min Winter	9.629	0.629	1.1	125.8	O K
2880 min Winter	9.574	0.574	1.1	114.9	O K
4320 min Winter	9.452	0.452	1.1	90.4	O K
5760 min Winter	9.336	0.336	1.1	67.2	O K
7200 min Winter	9.248	0.248	1.1	49.6	O K
8640 min Winter	9.183	0.183	1.1	36.7	O K
10080 min Winter	9.138	0.138	1.1	27.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	169.9	584
720 min Winter	8.424	0.0	173.5	698
960 min Winter	6.697	0.0	174.0	916
1440 min Winter	4.839	0.0	167.6	1198
2160 min Winter	3.490	0.0	226.1	1640
2880 min Winter	2.766	0.0	238.7	2104
4320 min Winter	1.989	0.0	257.0	2984
5760 min Winter	1.573	0.0	272.5	3696
7200 min Winter	1.311	0.0	283.7	4400
8640 min Winter	1.129	0.0	293.0	5024
10080 min Winter	0.994	0.0	300.8	5656

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.215

Time (mins) From:	To:	Area (ha)
0	4	0.215

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	200.0	1.000	200.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1300-1000-1300
Design Head (m)	1.000
Design Flow (l/s)	1.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.3	Kick-Flo®	0.477	0.9
Flush-Flo™	0.236	1.1	Mean Flow over Head Range	-	1.1

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)	Depth (m)	Flow (l/s)
0.100	1.0	0.800	1.2	2.000	1.8	4.000	2.4	7.000	3.2
0.200	1.1	1.000	1.3	2.200	1.9	4.500	2.6	7.500	3.3
0.300	1.1	1.200	1.4	2.400	1.9	5.000	2.7	8.000	3.4
0.400	1.1	1.400	1.5	2.600	2.0	5.500	2.8	8.500	3.5
0.500	1.0	1.600	1.6	3.000	2.1	6.000	2.9	9.000	3.6
0.600	1.0	1.800	1.7	3.500	2.3	6.500	3.1	9.500	3.6

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	9.258	0.258	1.4	51.6	O K
30 min Summer	9.336	0.336	1.4	67.2	O K
60 min Summer	9.413	0.413	1.4	82.7	O K
120 min Summer	9.486	0.486	1.4	97.1	O K
180 min Summer	9.522	0.522	1.4	104.3	O K
240 min Summer	9.542	0.542	1.4	108.3	O K
360 min Summer	9.561	0.561	1.4	112.3	O K
480 min Summer	9.568	0.568	1.4	113.6	O K
600 min Summer	9.567	0.567	1.4	113.3	O K
720 min Summer	9.560	0.560	1.4	112.1	O K
960 min Summer	9.544	0.544	1.4	108.9	O K
1440 min Summer	9.509	0.509	1.4	101.8	O K
2160 min Summer	9.455	0.455	1.4	91.0	O K
2880 min Summer	9.406	0.406	1.4	81.2	O K
4320 min Summer	9.322	0.322	1.4	64.3	O K
5760 min Summer	9.253	0.253	1.4	50.6	O K
7200 min Summer	9.201	0.201	1.4	40.1	O K
8640 min Summer	9.161	0.161	1.3	32.3	O K
10080 min Summer	9.132	0.132	1.3	26.5	O K
15 min Winter	9.289	0.289	1.4	57.9	O K
30 min Winter	9.377	0.377	1.4	75.5	O K
60 min Winter	9.465	0.465	1.4	93.0	O K
120 min Winter	9.549	0.549	1.4	109.7	O K
180 min Winter	9.590	0.590	1.4	118.0	O K
240 min Winter	9.614	0.614	1.4	122.7	O K
360 min Winter	9.638	0.638	1.4	127.7	O K
480 min Winter	9.649	0.649	1.4	129.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	50.9	19
30 min Summer	90.705	0.0	66.9	34
60 min Summer	56.713	0.0	85.5	64
120 min Summer	34.246	0.0	103.4	122
180 min Summer	25.149	0.0	113.8	182
240 min Summer	20.078	0.0	121.2	242
360 min Summer	14.585	0.0	132.0	362
480 min Summer	11.622	0.0	140.1	482
600 min Summer	9.738	0.0	146.7	600
720 min Summer	8.424	0.0	152.1	716
960 min Summer	6.697	0.0	160.9	818
1440 min Summer	4.839	0.0	173.2	1066
2160 min Summer	3.490	0.0	190.8	1432
2880 min Summer	2.766	0.0	201.5	1820
4320 min Summer	1.989	0.0	217.1	2596
5760 min Summer	1.573	0.0	229.7	3336
7200 min Summer	1.311	0.0	239.1	4032
8640 min Summer	1.129	0.0	246.9	4680
10080 min Summer	0.994	0.0	253.4	5352
15 min Winter	138.153	0.0	57.1	19
30 min Winter	90.705	0.0	74.9	33
60 min Winter	56.713	0.0	95.8	62
120 min Winter	34.246	0.0	115.8	122
180 min Winter	25.149	0.0	127.5	180
240 min Winter	20.078	0.0	135.7	238
360 min Winter	14.585	0.0	147.7	354
480 min Winter	11.622	0.0	156.8	468

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
600 min Winter	9.650	0.650	1.4	130.1	O K
720 min Winter	9.647	0.647	1.4	129.3	O K
960 min Winter	9.630	0.630	1.4	126.0	O K
1440 min Winter	9.588	0.588	1.4	117.5	O K
2160 min Winter	9.519	0.519	1.4	103.8	O K
2880 min Winter	9.439	0.439	1.4	87.9	O K
4320 min Winter	9.310	0.310	1.4	61.9	O K
5760 min Winter	9.214	0.214	1.4	42.8	O K
7200 min Winter	9.150	0.150	1.3	30.0	O K
8640 min Winter	9.110	0.110	1.2	22.0	O K
10080 min Winter	9.086	0.086	1.1	17.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	164.0	582
720 min Winter	8.424	0.0	170.0	692
960 min Winter	6.697	0.0	179.5	904
1440 min Winter	4.839	0.0	190.6	1126
2160 min Winter	3.490	0.0	213.7	1600
2880 min Winter	2.766	0.0	225.7	1992
4320 min Winter	1.989	0.0	243.3	2768
5760 min Winter	1.573	0.0	257.3	3464
7200 min Winter	1.311	0.0	267.9	4112
8640 min Winter	1.129	0.0	276.6	4752
10080 min Winter	0.994	0.0	284.0	5344

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.203

Time (mins) From:	To:	Area (ha)
0	4	0.203

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	200.0	1.000	200.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0058-1500-1000-1500
Design Head (m)	1.000
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5	Kick-Flo®	0.515	1.1
Flush-Flo™	0.253	1.4	Mean Flow over Head Range	-	1.2

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)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.4	2.000	2.0	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.1	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.9
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.3	8.500	4.0
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.1
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.5	9.500	4.2

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	9.216	0.216	1.1	43.2	O K
30 min Summer	9.282	0.282	1.1	56.3	O K
60 min Summer	9.346	0.346	1.1	69.3	O K
120 min Summer	9.407	0.407	1.1	81.3	O K
180 min Summer	9.436	0.436	1.1	87.3	O K
240 min Summer	9.453	0.453	1.1	90.6	O K
360 min Summer	9.470	0.470	1.1	94.0	O K
480 min Summer	9.476	0.476	1.1	95.3	O K
600 min Summer	9.476	0.476	1.1	95.2	O K
720 min Summer	9.471	0.471	1.1	94.1	O K
960 min Summer	9.456	0.456	1.1	91.2	O K
1440 min Summer	9.427	0.427	1.1	85.5	O K
2160 min Summer	9.385	0.385	1.1	77.1	O K
2880 min Summer	9.346	0.346	1.1	69.2	O K
4320 min Summer	9.277	0.277	1.1	55.4	O K
5760 min Summer	9.221	0.221	1.1	44.1	O K
7200 min Summer	9.177	0.177	1.1	35.4	O K
8640 min Summer	9.144	0.144	1.1	28.8	O K
10080 min Summer	9.119	0.119	1.1	23.9	O K
15 min Winter	9.242	0.242	1.1	48.5	O K
30 min Winter	9.316	0.316	1.1	63.2	O K
60 min Winter	9.390	0.390	1.1	77.9	O K
120 min Winter	9.459	0.459	1.1	91.9	O K
180 min Winter	9.495	0.495	1.1	99.0	O K
240 min Winter	9.515	0.515	1.1	103.0	O K
360 min Winter	9.537	0.537	1.1	107.4	O K
480 min Winter	9.547	0.547	1.1	109.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	42.3	19
30 min Summer	90.705	0.0	55.7	34
60 min Summer	56.713	0.0	71.5	64
120 min Summer	34.246	0.0	86.4	122
180 min Summer	25.149	0.0	95.1	182
240 min Summer	20.078	0.0	101.3	242
360 min Summer	14.585	0.0	110.3	362
480 min Summer	11.622	0.0	117.1	482
600 min Summer	9.738	0.0	122.5	600
720 min Summer	8.424	0.0	127.1	720
960 min Summer	6.697	0.0	134.4	808
1440 min Summer	4.839	0.0	144.7	1038
2160 min Summer	3.490	0.0	159.7	1428
2880 min Summer	2.766	0.0	168.6	1820
4320 min Summer	1.989	0.0	181.7	2596
5760 min Summer	1.573	0.0	192.3	3344
7200 min Summer	1.311	0.0	200.2	4032
8640 min Summer	1.129	0.0	206.7	4752
10080 min Summer	0.994	0.0	212.1	5440
15 min Winter	138.153	0.0	47.5	19
30 min Winter	90.705	0.0	62.3	33
60 min Winter	56.713	0.0	80.1	62
120 min Winter	34.246	0.0	96.7	122
180 min Winter	25.149	0.0	106.5	180
240 min Winter	20.078	0.0	113.4	238
360 min Winter	14.585	0.0	123.4	354
480 min Winter	11.622	0.0	130.9	470

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
600 min Winter	9.549	0.549	1.1	109.8	O K
720 min Winter	9.546	0.546	1.1	109.3	O K
960 min Winter	9.534	0.534	1.1	106.7	O K
1440 min Winter	9.497	0.497	1.1	99.4	O K
2160 min Winter	9.435	0.435	1.1	86.9	O K
2880 min Winter	9.373	0.373	1.1	74.7	O K
4320 min Winter	9.268	0.268	1.1	53.7	O K
5760 min Winter	9.190	0.190	1.1	37.9	O K
7200 min Winter	9.136	0.136	1.1	27.2	O K
8640 min Winter	9.101	0.101	1.0	20.3	O K
10080 min Winter	9.080	0.080	1.0	16.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	137.0	582
720 min Winter	8.424	0.0	141.9	694
960 min Winter	6.697	0.0	149.7	906
1440 min Winter	4.839	0.0	158.6	1140
2160 min Winter	3.490	0.0	178.8	1576
2880 min Winter	2.766	0.0	188.9	1988
4320 min Winter	1.989	0.0	203.6	2768
5760 min Winter	1.573	0.0	215.4	3464
7200 min Winter	1.311	0.0	224.2	4112
8640 min Winter	1.129	0.0	231.6	4760
10080 min Winter	0.994	0.0	237.7	5352

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.170

Time (mins) From:	To:	Area (ha)
0	4	0.170

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	200.0	1.000	200.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1300-1000-1300
Design Head (m)	1.000
Design Flow (l/s)	1.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.3	Kick-Flo®	0.477	0.9
Flush-Flo™	0.236	1.1	Mean Flow over Head Range	-	1.1

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)	Depth (m)	Flow (l/s)
0.100	1.0	0.800	1.2	2.000	1.8	4.000	2.4	7.000	3.2
0.200	1.1	1.000	1.3	2.200	1.9	4.500	2.6	7.500	3.3
0.300	1.1	1.200	1.4	2.400	1.9	5.000	2.7	8.000	3.4
0.400	1.1	1.400	1.5	2.600	2.0	5.500	2.8	8.500	3.5
0.500	1.0	1.600	1.6	3.000	2.1	6.000	2.9	9.000	3.6
0.600	1.0	1.800	1.7	3.500	2.3	6.500	3.1	9.500	3.6

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	9.230	0.230	0.8	23.0	O K
30 min Summer	9.298	0.298	0.8	29.8	O K
60 min Summer	9.365	0.365	0.8	36.5	O K
120 min Summer	9.425	0.425	0.8	42.5	O K
180 min Summer	9.452	0.452	0.8	45.2	O K
240 min Summer	9.463	0.463	0.8	46.3	O K
360 min Summer	9.470	0.470	0.8	47.0	O K
480 min Summer	9.465	0.465	0.8	46.5	O K
600 min Summer	9.456	0.456	0.8	45.6	O K
720 min Summer	9.447	0.447	0.8	44.7	O K
960 min Summer	9.428	0.428	0.8	42.8	O K
1440 min Summer	9.385	0.385	0.8	38.5	O K
2160 min Summer	9.327	0.327	0.8	32.7	O K
2880 min Summer	9.277	0.277	0.8	27.7	O K
4320 min Summer	9.196	0.196	0.8	19.6	O K
5760 min Summer	9.142	0.142	0.8	14.2	O K
7200 min Summer	9.106	0.106	0.8	10.6	O K
8640 min Summer	9.084	0.084	0.7	8.4	O K
10080 min Summer	9.070	0.070	0.7	7.0	O K
15 min Winter	9.258	0.258	0.8	25.8	O K
30 min Winter	9.335	0.335	0.8	33.5	O K
60 min Winter	9.412	0.412	0.8	41.2	O K
120 min Winter	9.481	0.481	0.8	48.1	O K
180 min Winter	9.512	0.512	0.8	51.2	O K
240 min Winter	9.527	0.527	0.8	52.7	O K
360 min Winter	9.538	0.538	0.8	53.8	O K
480 min Winter	9.536	0.536	0.8	53.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	23.2	19
30 min Summer	90.705	0.0	30.5	33
60 min Summer	56.713	0.0	38.5	64
120 min Summer	34.246	0.0	46.5	122
180 min Summer	25.149	0.0	51.3	182
240 min Summer	20.078	0.0	54.6	242
360 min Summer	14.585	0.0	59.5	360
480 min Summer	11.622	0.0	63.2	478
600 min Summer	9.738	0.0	66.2	526
720 min Summer	8.424	0.0	68.7	590
960 min Summer	6.697	0.0	72.8	714
1440 min Summer	4.839	0.0	78.8	968
2160 min Summer	3.490	0.0	85.6	1360
2880 min Summer	2.766	0.0	90.5	1732
4320 min Summer	1.989	0.0	97.5	2464
5760 min Summer	1.573	0.0	103.0	3168
7200 min Summer	1.311	0.0	107.2	3824
8640 min Summer	1.129	0.0	110.8	4496
10080 min Summer	0.994	0.0	113.8	5152
15 min Winter	138.153	0.0	26.0	19
30 min Winter	90.705	0.0	34.1	33
60 min Winter	56.713	0.0	43.1	62
120 min Winter	34.246	0.0	52.1	120
180 min Winter	25.149	0.0	57.4	180
240 min Winter	20.078	0.0	61.1	236
360 min Winter	14.585	0.0	66.6	350
480 min Winter	11.622	0.0	70.8	462

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
600 min Winter	9.528	0.528	0.8	52.8	O K
720 min Winter	9.516	0.516	0.8	51.6	O K
960 min Winter	9.492	0.492	0.8	49.2	O K
1440 min Winter	9.440	0.440	0.8	44.0	O K
2160 min Winter	9.348	0.348	0.8	34.8	O K
2880 min Winter	9.270	0.270	0.8	27.0	O K
4320 min Winter	9.159	0.159	0.8	15.9	O K
5760 min Winter	9.098	0.098	0.8	9.8	O K
7200 min Winter	9.070	0.070	0.7	7.0	O K
8640 min Winter	9.059	0.059	0.6	5.9	O K
10080 min Winter	9.051	0.051	0.5	5.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	74.1	568
720 min Winter	8.424	0.0	76.9	666
960 min Winter	6.697	0.0	81.5	752
1440 min Winter	4.839	0.0	88.2	1068
2160 min Winter	3.490	0.0	95.9	1472
2880 min Winter	2.766	0.0	101.3	1872
4320 min Winter	1.989	0.0	109.2	2552
5760 min Winter	1.573	0.0	115.4	3176
7200 min Winter	1.311	0.0	120.1	3752
8640 min Winter	1.129	0.0	124.1	4496
10080 min Winter	0.994	0.0	127.4	5152

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.091

Time (mins) From:	To:	Area (ha)
0	4	0.091

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	100.0	1.000	100.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0047-1000-1000-1000
Design Head (m)	1.000
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	47
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.0	Kick-Flo®	0.415	0.7
Flush-Flo™	0.205	0.8	Mean Flow over Head Range	-	0.8

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)	Depth (m)	Flow (l/s)
0.100	0.8	0.800	0.9	2.000	1.4	4.000	1.9	7.000	2.4
0.200	0.8	1.000	1.0	2.200	1.4	4.500	2.0	7.500	2.5
0.300	0.8	1.200	1.1	2.400	1.5	5.000	2.1	8.000	2.6
0.400	0.7	1.400	1.2	2.600	1.5	5.500	2.2	8.500	2.7
0.500	0.7	1.600	1.2	3.000	1.6	6.000	2.3	9.000	2.7
0.600	0.8	1.800	1.3	3.500	1.8	6.500	2.3	9.500	2.8

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	9.246	0.246	1.1	88.5	O K
30 min Summer	9.322	0.322	1.1	115.8	O K
60 min Summer	9.399	0.399	1.1	143.7	O K
120 min Summer	9.476	0.476	1.1	171.3	O K
180 min Summer	9.518	0.518	1.1	186.4	O K
240 min Summer	9.544	0.544	1.1	196.0	O K
360 min Summer	9.579	0.579	1.1	208.5	O K
480 min Summer	9.601	0.601	1.1	216.4	O K
600 min Summer	9.615	0.615	1.1	221.4	O K
720 min Summer	9.624	0.624	1.1	224.7	O K
960 min Summer	9.633	0.633	1.1	227.8	O K
1440 min Summer	9.628	0.628	1.1	226.2	O K
2160 min Summer	9.604	0.604	1.1	217.6	O K
2880 min Summer	9.580	0.580	1.1	209.0	O K
4320 min Summer	9.534	0.534	1.1	192.2	O K
5760 min Summer	9.487	0.487	1.1	175.4	O K
7200 min Summer	9.436	0.436	1.1	157.1	O K
8640 min Summer	9.391	0.391	1.1	140.9	O K
10080 min Summer	9.351	0.351	1.1	126.5	O K
15 min Winter	9.276	0.276	1.1	99.2	O K
30 min Winter	9.361	0.361	1.1	129.8	O K
60 min Winter	9.448	0.448	1.1	161.3	O K
120 min Winter	9.535	0.535	1.1	192.5	O K
180 min Winter	9.582	0.582	1.1	209.6	O K
240 min Winter	9.613	0.613	1.1	220.6	O K
360 min Winter	9.653	0.653	1.1	235.1	O K
480 min Winter	9.679	0.679	1.1	244.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	78.8	19
30 min Summer	90.705	0.0	93.3	34
60 min Summer	56.713	0.0	141.5	64
120 min Summer	34.246	0.0	167.6	124
180 min Summer	25.149	0.0	177.6	184
240 min Summer	20.078	0.0	179.6	244
360 min Summer	14.585	0.0	178.2	362
480 min Summer	11.622	0.0	176.0	482
600 min Summer	9.738	0.0	173.7	602
720 min Summer	8.424	0.0	171.6	722
960 min Summer	6.697	0.0	167.7	962
1440 min Summer	4.839	0.0	160.9	1440
2160 min Summer	3.490	0.0	316.8	1820
2880 min Summer	2.766	0.0	324.2	2192
4320 min Summer	1.989	0.0	300.0	2984
5760 min Summer	1.573	0.0	389.6	3856
7200 min Summer	1.311	0.0	405.5	4608
8640 min Summer	1.129	0.0	418.7	5360
10080 min Summer	0.994	0.0	429.4	6056
15 min Winter	138.153	0.0	86.1	19
30 min Winter	90.705	0.0	95.3	34
60 min Winter	56.713	0.0	157.3	64
120 min Winter	34.246	0.0	179.1	122
180 min Winter	25.149	0.0	180.7	182
240 min Winter	20.078	0.0	179.7	240
360 min Winter	14.585	0.0	177.3	358
480 min Winter	11.622	0.0	175.2	476

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
600 min Winter	9.696	0.696	1.1	250.7	O K
720 min Winter	9.708	0.708	1.1	255.0	Flood Risk
960 min Winter	9.721	0.721	1.1	259.6	Flood Risk
1440 min Winter	9.723	0.723	1.1	260.3	Flood Risk
2160 min Winter	9.699	0.699	1.1	251.6	O K
2880 min Winter	9.668	0.668	1.1	240.3	O K
4320 min Winter	9.607	0.607	1.1	218.7	O K
5760 min Winter	9.544	0.544	1.1	195.9	O K
7200 min Winter	9.475	0.475	1.1	171.2	O K
8640 min Winter	9.401	0.401	1.1	144.5	O K
10080 min Winter	9.340	0.340	1.1	122.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	173.5	592
720 min Winter	8.424	0.0	172.0	708
960 min Winter	6.697	0.0	169.5	936
1440 min Winter	4.839	0.0	166.4	1386
2160 min Winter	3.490	0.0	342.8	2016
2880 min Winter	2.766	0.0	335.7	2304
4320 min Winter	1.989	0.0	309.4	3240
5760 min Winter	1.573	0.0	436.3	4152
7200 min Winter	1.311	0.0	454.1	5048
8640 min Winter	1.129	0.0	469.0	5792
10080 min Winter	0.994	0.0	481.3	6464

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.345

Time (mins) From:	To:	Area (ha)
0	4	0.345

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	360.0	1.000	360.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1300-1000-1300
Design Head (m)	1.000
Design Flow (l/s)	1.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.3	Kick-Flo®	0.477	0.9
Flush-Flo™	0.236	1.1	Mean Flow over Head Range	-	1.1

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)	Depth (m)	Flow (l/s)
0.100	1.0	0.800	1.2	2.000	1.8	4.000	2.4	7.000	3.2
0.200	1.1	1.000	1.3	2.200	1.9	4.500	2.6	7.500	3.3
0.300	1.1	1.200	1.4	2.400	1.9	5.000	2.7	8.000	3.4
0.400	1.1	1.400	1.5	2.600	2.0	5.500	2.8	8.500	3.5
0.500	1.0	1.600	1.6	3.000	2.1	6.000	2.9	9.000	3.6
0.600	1.0	1.800	1.7	3.500	2.3	6.500	3.1	9.500	3.6

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	9.230	0.230	2.5	114.9	O K
30 min Summer	9.300	0.300	2.5	149.9	O K
60 min Summer	9.370	0.370	2.5	185.1	O K
120 min Summer	9.437	0.437	2.5	218.4	O K
180 min Summer	9.471	0.471	2.5	235.4	O K
240 min Summer	9.491	0.491	2.5	245.4	O K
360 min Summer	9.513	0.513	2.5	256.7	O K
480 min Summer	9.524	0.524	2.5	262.2	O K
600 min Summer	9.528	0.528	2.5	264.1	O K
720 min Summer	9.527	0.527	2.5	263.6	O K
960 min Summer	9.518	0.518	2.5	259.1	O K
1440 min Summer	9.497	0.497	2.5	248.5	O K
2160 min Summer	9.463	0.463	2.5	231.4	O K
2880 min Summer	9.428	0.428	2.5	213.9	O K
4320 min Summer	9.363	0.363	2.5	181.4	O K
5760 min Summer	9.306	0.306	2.5	153.2	O K
7200 min Summer	9.259	0.259	2.5	129.5	O K
8640 min Summer	9.220	0.220	2.4	109.9	O K
10080 min Summer	9.188	0.188	2.4	94.2	O K
15 min Winter	9.258	0.258	2.5	128.8	O K
30 min Winter	9.336	0.336	2.5	168.2	O K
60 min Winter	9.416	0.416	2.5	207.8	O K
120 min Winter	9.492	0.492	2.5	245.9	O K
180 min Winter	9.532	0.532	2.5	265.8	O K
240 min Winter	9.555	0.555	2.5	277.7	O K
360 min Winter	9.584	0.584	2.5	292.2	O K
480 min Winter	9.601	0.601	2.5	300.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	107.5	19
30 min Summer	90.705	0.0	141.1	34
60 min Summer	56.713	0.0	186.8	64
120 min Summer	34.246	0.0	225.7	124
180 min Summer	25.149	0.0	248.5	182
240 min Summer	20.078	0.0	264.3	242
360 min Summer	14.585	0.0	287.4	362
480 min Summer	11.622	0.0	304.5	482
600 min Summer	9.738	0.0	317.9	600
720 min Summer	8.424	0.0	328.8	720
960 min Summer	6.697	0.0	344.8	858
1440 min Summer	4.839	0.0	357.9	1084
2160 min Summer	3.490	0.0	420.8	1472
2880 min Summer	2.766	0.0	444.2	1876
4320 min Summer	1.989	0.0	477.6	2680
5760 min Summer	1.573	0.0	508.3	3456
7200 min Summer	1.311	0.0	529.0	4176
8640 min Summer	1.129	0.0	546.0	4848
10080 min Summer	0.994	0.0	559.5	5552
15 min Winter	138.153	0.0	120.6	19
30 min Winter	90.705	0.0	157.2	33
60 min Winter	56.713	0.0	209.4	62
120 min Winter	34.246	0.0	252.7	122
180 min Winter	25.149	0.0	278.0	180
240 min Winter	20.078	0.0	295.4	238
360 min Winter	14.585	0.0	320.5	356
480 min Winter	11.622	0.0	338.5	472

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
600 min Winter	9.609	0.609	2.5	304.4	O K
720 min Winter	9.612	0.612	2.5	305.9	O K
960 min Winter	9.608	0.608	2.5	303.8	O K
1440 min Winter	9.576	0.576	2.5	288.0	O K
2160 min Winter	9.527	0.527	2.5	263.6	O K
2880 min Winter	9.476	0.476	2.5	237.8	O K
4320 min Winter	9.377	0.377	2.5	188.4	O K
5760 min Winter	9.293	0.293	2.5	146.6	O K
7200 min Winter	9.227	0.227	2.5	113.6	O K
8640 min Winter	9.178	0.178	2.4	89.0	O K
10080 min Winter	9.142	0.142	2.3	70.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	351.9	588
720 min Winter	8.424	0.0	361.6	700
960 min Winter	6.697	0.0	371.3	924
1440 min Winter	4.839	0.0	365.9	1312
2160 min Winter	3.490	0.0	471.3	1620
2880 min Winter	2.766	0.0	497.4	2048
4320 min Winter	1.989	0.0	534.7	2892
5760 min Winter	1.573	0.0	569.5	3640
7200 min Winter	1.311	0.0	592.7	4328
8640 min Winter	1.129	0.0	611.9	5016
10080 min Winter	0.994	0.0	627.4	5656

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.450

Time (mins) From:	To:	Area (ha)
0	4	0.450

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	500.0	1.000	500.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0075-2500-1000-2500
Design Head (m)	1.000
Design Flow (l/s)	2.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	75
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.5	Kick-Flo®	0.627	2.0
Flush-Flo™	0.307	2.5	Mean Flow over Head Range	-	2.2

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)	Depth (m)	Flow (l/s)
0.100	2.1	0.800	2.3	2.000	3.4	4.000	4.7	7.000	6.2
0.200	2.4	1.000	2.5	2.200	3.6	4.500	5.0	7.500	6.4
0.300	2.5	1.200	2.7	2.400	3.7	5.000	5.3	8.000	6.6
0.400	2.5	1.400	2.9	2.600	3.9	5.500	5.5	8.500	6.8
0.500	2.4	1.600	3.1	3.000	4.1	6.000	5.7	9.000	7.0
0.600	2.1	1.800	3.3	3.500	4.5	6.500	6.0	9.500	7.1

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	9.327	0.327	1.4	81.9	O K
30 min Summer	9.428	0.428	1.4	106.9	O K
60 min Summer	9.530	0.530	1.4	132.5	O K
120 min Summer	9.628	0.628	1.4	157.1	O K
180 min Summer	9.680	0.680	1.4	169.9	O K
240 min Summer	9.711	0.711	1.4	177.7	Flood Risk
360 min Summer	9.748	0.748	1.4	187.1	Flood Risk
480 min Summer	9.769	0.769	1.4	192.2	Flood Risk
600 min Summer	9.779	0.779	1.4	194.8	Flood Risk
720 min Summer	9.783	0.783	1.4	195.8	Flood Risk
960 min Summer	9.779	0.779	1.4	194.7	Flood Risk
1440 min Summer	9.752	0.752	1.4	188.1	Flood Risk
2160 min Summer	9.712	0.712	1.4	177.9	Flood Risk
2880 min Summer	9.673	0.673	1.4	168.2	O K
4320 min Summer	9.599	0.599	1.4	149.7	O K
5760 min Summer	9.525	0.525	1.4	131.3	O K
7200 min Summer	9.444	0.444	1.4	111.1	O K
8640 min Summer	9.378	0.378	1.4	94.5	O K
10080 min Summer	9.322	0.322	1.4	80.4	O K
15 min Winter	9.367	0.367	1.4	91.8	O K
30 min Winter	9.480	0.480	1.4	120.0	O K
60 min Winter	9.595	0.595	1.4	148.7	O K
120 min Winter	9.706	0.706	1.4	176.6	Flood Risk
180 min Winter	9.765	0.765	1.4	191.4	Flood Risk
240 min Winter	9.802	0.802	1.4	200.4	Flood Risk
360 min Winter	9.847	0.847	1.4	211.7	Flood Risk
480 min Winter	9.873	0.873	1.4	218.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	79.0	19
30 min Summer	90.705	0.0	101.3	34
60 min Summer	56.713	0.0	134.3	64
120 min Summer	34.246	0.0	161.7	124
180 min Summer	25.149	0.0	177.6	184
240 min Summer	20.078	0.0	188.3	242
360 min Summer	14.585	0.0	202.6	362
480 min Summer	11.622	0.0	210.3	482
600 min Summer	9.738	0.0	212.2	602
720 min Summer	8.424	0.0	211.6	722
960 min Summer	6.697	0.0	208.3	960
1440 min Summer	4.839	0.0	199.7	1224
2160 min Summer	3.490	0.0	300.1	1600
2880 min Summer	2.766	0.0	316.6	2016
4320 min Summer	1.989	0.0	338.1	2852
5760 min Summer	1.573	0.0	362.0	3688
7200 min Summer	1.311	0.0	376.9	4392
8640 min Summer	1.129	0.0	389.3	5104
10080 min Summer	0.994	0.0	399.5	5848
15 min Winter	138.153	0.0	88.0	19
30 min Winter	90.705	0.0	109.0	33
60 min Winter	56.713	0.0	150.2	64
120 min Winter	34.246	0.0	180.5	122
180 min Winter	25.149	0.0	197.3	180
240 min Winter	20.078	0.0	207.6	240
360 min Winter	14.585	0.0	216.2	356
480 min Winter	11.622	0.0	216.8	472

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
600 min Winter	9.888	0.888	1.4	221.9	Flood Risk
720 min Winter	9.895	0.895	1.4	223.8	Flood Risk
960 min Winter	9.897	0.897	1.4	224.2	Flood Risk
1440 min Winter	9.871	0.871	1.4	217.8	Flood Risk
2160 min Winter	9.819	0.819	1.4	204.9	Flood Risk
2880 min Winter	9.768	0.768	1.4	192.0	Flood Risk
4320 min Winter	9.663	0.663	1.4	165.8	O K
5760 min Winter	9.558	0.558	1.4	139.4	O K
7200 min Winter	9.433	0.433	1.4	108.2	O K
8640 min Winter	9.336	0.336	1.4	83.9	O K
10080 min Winter	9.259	0.259	1.4	64.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	216.0	588
720 min Winter	8.424	0.0	214.6	702
960 min Winter	6.697	0.0	211.5	924
1440 min Winter	4.839	0.0	205.1	1354
2160 min Winter	3.490	0.0	335.8	1688
2880 min Winter	2.766	0.0	353.9	2160
4320 min Winter	1.989	0.0	369.0	3072
5760 min Winter	1.573	0.0	405.5	3984
7200 min Winter	1.311	0.0	422.2	4688
8640 min Winter	1.129	0.0	436.1	5368
10080 min Winter	0.994	0.0	447.7	6048

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.320

Time (mins) From:	To:	Area (ha)
0	4	0.320

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	250.0	1.000	250.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0058-1500-1000-1500
Design Head (m)	1.000
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5	Kick-Flo®	0.515	1.1
Flush-Flo™	0.253	1.4	Mean Flow over Head Range	-	1.2

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)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.4	2.000	2.0	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.1	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.9
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.3	8.500	4.0
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.1
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.5	9.500	4.2

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	9.298	0.298	1.1	38.8	O K
30 min Summer	9.388	0.388	1.1	50.4	O K
60 min Summer	9.477	0.477	1.1	62.1	O K
120 min Summer	9.558	0.558	1.1	72.6	O K
180 min Summer	9.596	0.596	1.1	77.5	O K
240 min Summer	9.615	0.615	1.1	79.9	O K
360 min Summer	9.630	0.630	1.1	81.9	O K
480 min Summer	9.630	0.630	1.1	81.9	O K
600 min Summer	9.622	0.622	1.1	80.9	O K
720 min Summer	9.612	0.612	1.1	79.6	O K
960 min Summer	9.593	0.593	1.1	77.0	O K
1440 min Summer	9.552	0.552	1.1	71.8	O K
2160 min Summer	9.492	0.492	1.1	63.9	O K
2880 min Summer	9.426	0.426	1.1	55.3	O K
4320 min Summer	9.319	0.319	1.1	41.4	O K
5760 min Summer	9.237	0.237	1.1	30.9	O K
7200 min Summer	9.180	0.180	1.1	23.4	O K
8640 min Summer	9.139	0.139	1.1	18.1	O K
10080 min Summer	9.111	0.111	1.0	14.5	O K
15 min Winter	9.335	0.335	1.1	43.5	O K
30 min Winter	9.436	0.436	1.1	56.7	O K
60 min Winter	9.537	0.537	1.1	69.9	O K
120 min Winter	9.630	0.630	1.1	81.8	O K
180 min Winter	9.674	0.674	1.1	87.6	O K
240 min Winter	9.697	0.697	1.1	90.6	O K
360 min Winter	9.718	0.718	1.1	93.4	Flood Risk
480 min Winter	9.723	0.723	1.1	94.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	38.9	19
30 min Summer	90.705	0.0	51.1	34
60 min Summer	56.713	0.0	64.7	64
120 min Summer	34.246	0.0	78.2	122
180 min Summer	25.149	0.0	86.1	182
240 min Summer	20.078	0.0	91.7	242
360 min Summer	14.585	0.0	99.9	362
480 min Summer	11.622	0.0	106.1	480
600 min Summer	9.738	0.0	111.1	582
720 min Summer	8.424	0.0	115.3	628
960 min Summer	6.697	0.0	122.2	752
1440 min Summer	4.839	0.0	132.1	1012
2160 min Summer	3.490	0.0	144.0	1432
2880 min Summer	2.766	0.0	152.1	1816
4320 min Summer	1.989	0.0	163.9	2552
5760 min Summer	1.573	0.0	173.2	3280
7200 min Summer	1.311	0.0	180.3	3960
8640 min Summer	1.129	0.0	186.3	4592
10080 min Summer	0.994	0.0	191.3	5336
15 min Winter	138.153	0.0	43.6	19
30 min Winter	90.705	0.0	57.3	33
60 min Winter	56.713	0.0	72.5	62
120 min Winter	34.246	0.0	87.6	122
180 min Winter	25.149	0.0	96.5	180
240 min Winter	20.078	0.0	102.7	238
360 min Winter	14.585	0.0	111.9	352
480 min Winter	11.622	0.0	118.8	466

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
600 min Winter	9.719	0.719	1.1	93.5	Flood Risk
720 min Winter	9.709	0.709	1.1	92.2	Flood Risk
960 min Winter	9.682	0.682	1.1	88.6	O K
1440 min Winter	9.631	0.631	1.1	82.0	O K
2160 min Winter	9.548	0.548	1.1	71.2	O K
2880 min Winter	9.452	0.452	1.1	58.8	O K
4320 min Winter	9.288	0.288	1.1	37.4	O K
5760 min Winter	9.182	0.182	1.1	23.6	O K
7200 min Winter	9.120	0.120	1.1	15.6	O K
8640 min Winter	9.086	0.086	1.0	11.2	O K
10080 min Winter	9.071	0.071	0.9	9.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	124.4	576
720 min Winter	8.424	0.0	129.1	680
960 min Winter	6.697	0.0	136.7	788
1440 min Winter	4.839	0.0	147.5	1084
2160 min Winter	3.490	0.0	161.3	1556
2880 min Winter	2.766	0.0	170.4	1988
4320 min Winter	1.989	0.0	183.7	2684
5760 min Winter	1.573	0.0	194.0	3352
7200 min Winter	1.311	0.0	202.0	3968
8640 min Winter	1.129	0.0	208.7	4584
10080 min Winter	0.994	0.0	214.3	5240

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.153

Time (mins) From:	To:	Area (ha)
0	4	0.153

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	130.0	1.000	130.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1300-1000-1300
Design Head (m)	1.000
Design Flow (l/s)	1.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.3	Kick-Flo®	0.477	0.9
Flush-Flo™	0.236	1.1	Mean Flow over Head Range	-	1.1

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)	Depth (m)	Flow (l/s)
0.100	1.0	0.800	1.2	2.000	1.8	4.000	2.4	7.000	3.2
0.200	1.1	1.000	1.3	2.200	1.9	4.500	2.6	7.500	3.3
0.300	1.1	1.200	1.4	2.400	1.9	5.000	2.7	8.000	3.4
0.400	1.1	1.400	1.5	2.600	2.0	5.500	2.8	8.500	3.5
0.500	1.0	1.600	1.6	3.000	2.1	6.000	2.9	9.000	3.6
0.600	1.0	1.800	1.7	3.500	2.3	6.500	3.1	9.500	3.6

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	9.320	0.320	0.8	32.0	O K
30 min Summer	9.417	0.417	0.8	41.7	O K
60 min Summer	9.513	0.513	0.8	51.3	O K
120 min Summer	9.601	0.601	0.8	60.1	O K
180 min Summer	9.642	0.642	0.8	64.2	O K
240 min Summer	9.663	0.663	0.8	66.3	O K
360 min Summer	9.682	0.682	0.8	68.2	O K
480 min Summer	9.684	0.684	0.8	68.4	O K
600 min Summer	9.677	0.677	0.8	67.7	O K
720 min Summer	9.668	0.668	0.8	66.8	O K
960 min Summer	9.649	0.649	0.8	64.9	O K
1440 min Summer	9.611	0.611	0.8	61.1	O K
2160 min Summer	9.556	0.556	0.8	55.6	O K
2880 min Summer	9.504	0.504	0.8	50.4	O K
4320 min Summer	9.396	0.396	0.8	39.6	O K
5760 min Summer	9.298	0.298	0.8	29.8	O K
7200 min Summer	9.225	0.225	0.8	22.5	O K
8640 min Summer	9.172	0.172	0.8	17.2	O K
10080 min Summer	9.135	0.135	0.8	13.5	O K
15 min Winter	9.359	0.359	0.8	35.9	O K
30 min Winter	9.469	0.469	0.8	46.9	O K
60 min Winter	9.577	0.577	0.8	57.7	O K
120 min Winter	9.677	0.677	0.8	67.7	O K
180 min Winter	9.726	0.726	0.9	72.6	Flood Risk
240 min Winter	9.752	0.752	0.9	75.2	Flood Risk
360 min Winter	9.778	0.778	0.9	77.8	Flood Risk
480 min Winter	9.786	0.786	0.9	78.6	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	32.1	19
30 min Summer	90.705	0.0	42.2	34
60 min Summer	56.713	0.0	53.4	64
120 min Summer	34.246	0.0	64.4	122
180 min Summer	25.149	0.0	71.0	182
240 min Summer	20.078	0.0	75.6	242
360 min Summer	14.585	0.0	82.3	362
480 min Summer	11.622	0.0	87.4	480
600 min Summer	9.738	0.0	91.6	594
720 min Summer	8.424	0.0	95.0	642
960 min Summer	6.697	0.0	100.6	760
1440 min Summer	4.839	0.0	108.6	1024
2160 min Summer	3.490	0.0	118.6	1444
2880 min Summer	2.766	0.0	125.3	1848
4320 min Summer	1.989	0.0	135.1	2640
5760 min Summer	1.573	0.0	142.7	3344
7200 min Summer	1.311	0.0	148.5	4040
8640 min Summer	1.129	0.0	153.4	4680
10080 min Summer	0.994	0.0	157.6	5352
15 min Winter	138.153	0.0	36.0	19
30 min Winter	90.705	0.0	47.1	33
60 min Winter	56.713	0.0	59.8	62
120 min Winter	34.246	0.0	72.2	122
180 min Winter	25.149	0.0	79.5	180
240 min Winter	20.078	0.0	84.6	238
360 min Winter	14.585	0.0	92.2	352
480 min Winter	11.622	0.0	97.9	466

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
600 min Winter	9.783	0.783	0.9	78.3	Flood Risk
720 min Winter	9.775	0.775	0.9	77.5	Flood Risk
960 min Winter	9.749	0.749	0.9	74.9	Flood Risk
1440 min Winter	9.701	0.701	0.9	70.1	Flood Risk
2160 min Winter	9.624	0.624	0.8	62.4	O K
2880 min Winter	9.548	0.548	0.8	54.8	O K
4320 min Winter	9.384	0.384	0.8	38.4	O K
5760 min Winter	9.244	0.244	0.8	24.4	O K
7200 min Winter	9.156	0.156	0.8	15.6	O K
8640 min Winter	9.106	0.106	0.8	10.6	O K
10080 min Winter	9.078	0.078	0.7	7.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	102.5	576
720 min Winter	8.424	0.0	106.3	684
960 min Winter	6.697	0.0	112.5	810
1440 min Winter	4.839	0.0	120.6	1094
2160 min Winter	3.490	0.0	132.8	1556
2880 min Winter	2.766	0.0	140.3	2016
4320 min Winter	1.989	0.0	151.3	2852
5760 min Winter	1.573	0.0	159.8	3512
7200 min Winter	1.311	0.0	166.4	4112
8640 min Winter	1.129	0.0	171.9	4752
10080 min Winter	0.994	0.0	176.5	5344

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.126

Time (mins) From:	To:	Area (ha)
0	4	0.126

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	100.0	1.000	100.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0047-1000-1000-1000
Design Head (m)	1.000
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	47
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.0	Kick-Flo®	0.415	0.7
Flush-Flo™	0.205	0.8	Mean Flow over Head Range	-	0.8

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)	Depth (m)	Flow (l/s)
0.100	0.8	0.800	0.9	2.000	1.4	4.000	1.9	7.000	2.4
0.200	0.8	1.000	1.0	2.200	1.4	4.500	2.0	7.500	2.5
0.300	0.8	1.200	1.1	2.400	1.5	5.000	2.1	8.000	2.6
0.400	0.7	1.400	1.2	2.600	1.5	5.500	2.2	8.500	2.7
0.500	0.7	1.600	1.2	3.000	1.6	6.000	2.3	9.000	2.7
0.600	0.8	1.800	1.3	3.500	1.8	6.500	2.3	9.500	2.8

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	9.384	0.384	0.8	7.7	O K
30 min Summer	9.488	0.488	0.8	9.8	O K
60 min Summer	9.566	0.566	0.8	11.3	O K
120 min Summer	9.592	0.592	0.8	11.8	O K
180 min Summer	9.579	0.579	0.8	11.6	O K
240 min Summer	9.559	0.559	0.8	11.2	O K
360 min Summer	9.517	0.517	0.8	10.3	O K
480 min Summer	9.476	0.476	0.8	9.5	O K
600 min Summer	9.434	0.434	0.8	8.7	O K
720 min Summer	9.387	0.387	0.8	7.7	O K
960 min Summer	9.306	0.306	0.8	6.1	O K
1440 min Summer	9.192	0.192	0.8	3.8	O K
2160 min Summer	9.105	0.105	0.8	2.1	O K
2880 min Summer	9.071	0.071	0.7	1.4	O K
4320 min Summer	9.050	0.050	0.5	1.0	O K
5760 min Summer	9.040	0.040	0.4	0.8	O K
7200 min Summer	9.035	0.035	0.3	0.7	O K
8640 min Summer	9.032	0.032	0.3	0.6	O K
10080 min Summer	9.030	0.030	0.3	0.6	O K
15 min Winter	9.434	0.434	0.8	8.7	O K
30 min Winter	9.552	0.552	0.8	11.0	O K
60 min Winter	9.644	0.644	0.8	12.9	O K
120 min Winter	9.684	0.684	0.8	13.7	O K
180 min Winter	9.667	0.667	0.8	13.3	O K
240 min Winter	9.642	0.642	0.8	12.8	O K
360 min Winter	9.584	0.584	0.8	11.7	O K
480 min Winter	9.525	0.525	0.8	10.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	8.3	18
30 min Summer	90.705	0.0	10.9	33
60 min Summer	56.713	0.0	13.6	62
120 min Summer	34.246	0.0	16.4	116
180 min Summer	25.149	0.0	18.1	144
240 min Summer	20.078	0.0	19.3	176
360 min Summer	14.585	0.0	21.0	246
480 min Summer	11.622	0.0	22.3	316
600 min Summer	9.738	0.0	23.4	386
720 min Summer	8.424	0.0	24.3	448
960 min Summer	6.697	0.0	25.7	568
1440 min Summer	4.839	0.0	27.9	796
2160 min Summer	3.490	0.0	30.1	1128
2880 min Summer	2.766	0.0	31.9	1472
4320 min Summer	1.989	0.0	34.4	2200
5760 min Summer	1.573	0.0	36.2	2936
7200 min Summer	1.311	0.0	37.7	3584
8640 min Summer	1.129	0.0	39.0	4368
10080 min Summer	0.994	0.0	40.1	5048
15 min Winter	138.153	0.0	9.3	18
30 min Winter	90.705	0.0	12.2	32
60 min Winter	56.713	0.0	15.2	60
120 min Winter	34.246	0.0	18.4	116
180 min Winter	25.149	0.0	20.3	162
240 min Winter	20.078	0.0	21.6	188
360 min Winter	14.585	0.0	23.5	266
480 min Winter	11.622	0.0	25.0	342

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
600 min Winter	9.463	0.463	0.8	9.3	O K
720 min Winter	9.391	0.391	0.8	7.8	O K
960 min Winter	9.268	0.268	0.8	5.4	O K
1440 min Winter	9.129	0.129	0.8	2.6	O K
2160 min Winter	9.066	0.066	0.7	1.3	O K
2880 min Winter	9.050	0.050	0.5	1.0	O K
4320 min Winter	9.038	0.038	0.4	0.8	O K
5760 min Winter	9.032	0.032	0.3	0.6	O K
7200 min Winter	9.029	0.029	0.3	0.6	O K
8640 min Winter	9.026	0.026	0.2	0.5	O K
10080 min Winter	9.024	0.024	0.2	0.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	26.2	416
720 min Winter	8.424	0.0	27.2	484
960 min Winter	6.697	0.0	28.8	598
1440 min Winter	4.839	0.0	31.2	808
2160 min Winter	3.490	0.0	33.8	1120
2880 min Winter	2.766	0.0	35.7	1472
4320 min Winter	1.989	0.0	38.5	2164
5760 min Winter	1.573	0.0	40.6	2936
7200 min Winter	1.311	0.0	42.3	3640
8640 min Winter	1.129	0.0	43.7	4392
10080 min Winter	0.994	0.0	44.9	5016

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.032

Time (mins) From:	To:	Area (ha)
0	4	0.032

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	20.0	1.000	20.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0047-1000-1000-1000
Design Head (m)	1.000
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	47
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.0	Kick-Flo®	0.415	0.7
Flush-Flo™	0.205	0.8	Mean Flow over Head Range	-	0.8

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)	Depth (m)	Flow (l/s)
0.100	0.8	0.800	0.9	2.000	1.4	4.000	1.9	7.000	2.4
0.200	0.8	1.000	1.0	2.200	1.4	4.500	2.0	7.500	2.5
0.300	0.8	1.200	1.1	2.400	1.5	5.000	2.1	8.000	2.6
0.400	0.7	1.400	1.2	2.600	1.5	5.500	2.2	8.500	2.7
0.500	0.7	1.600	1.2	3.000	1.6	6.000	2.3	9.000	2.7
0.600	0.8	1.800	1.3	3.500	1.8	6.500	2.3	9.500	2.8

ISO A1 841mm x 594mm

PHASE B - BLOCK A1/A2
POSITIVELY DRAINED AREA =4500m²
STORM WATER DISCHARGE RATE = 2.5l/s
REQUIRED ATTENUATION VOLUME = 343m³
BELOW GROUND CELLULAR ATTENUATION CRATES:
AREA =130m²
DEPTH = 1.2m (95% VOID RATIO)
VOLUME = 148m³
BLUE/GREEN ROOF ATTENUATION:
VOLUME = 116m³
98m³
PERMEABLE PAVING:
AREA =475m²
DEPTH 0.3m (30% VOID RATIO)
VOLUME =43m³

TOTAL ATTENUATION PROVIDED = 308m³

PHASE B - BLOCK B1/B2
POSITIVELY DRAINED AREA =3000m²
STORM WATER DISCHARGE RATE = 1.5l/s
ATTENUATION VOLUME = 183m³
BELOW GROUND CELLULAR ATTENUATION CRATES:
AREA =150m²
DEPTH = 1.2m (95% VOID RATIO)
VOLUME = 171m³
BLUE/GREEN ROOF:
VOLUME = 55m³

TOTAL ATTENUATION = 226m³

PHASE B - BLOCK B3
POSITIVELY DRAINED AREA =1525m²
STORM WATER DISCHARGE RATE = 1.3l/s
REQUIRED ATTENUATION VOLUME = 129m³
BELOW GROUND CELLULAR ATTENUATION CRATES:
AREA =35m²
DEPTH = 2.4m (95% VOID RATIO)
VOLUME = 79.8m³
BLUE/GREEN ROOF:
VOLUME = 52m³

TOTAL ATTENUATION PROVIDED = 131.8m³

PHASE B - BLOCK B5
POSITIVELY DRAINED AREA =321m²
STORM WATER DISCHARGE RATE = 1l/s
REQUIRED ATTENUATION VOLUME = 13m³
BELOW GROUND CELLULAR ATTENUATION CRATES:
AREA =13.2m²
DEPTH =1.2 m (95% VOID RATIO)
VOLUME = 15m³

PHASE B - JOLLY'S GREEN
POSITIVELY DRAINED AREA =10,000m²
STORM WATER DISCHARGE RATE = 3.9l/s
REQUIRED ATTENUATION VOLUME = 98m³
PERMEABLE PAVING:
AREA =1380m²
DEPTH 0.3m (30% VOID RATIO)
VOLUME =120m³

TOTAL ATTENUATION PROVIDED = 120m³

PHASE C - BLOCK C1/C2/C3/C4
POSITIVELY DRAINED AREA =6005m²
STORM WATER DISCHARGE RATE = 1.5l/s
REQUIRED ATTENUATION VOLUME = 651m³
BELOW GROUND CELLULAR ATTENUATION CRATES:
AREA =364m²
DEPTH = 1.2m (95% VOID RATIO)
VOLUME = 426m³
BLUE/GREEN ROOF:
VOLUME = 238m³

TOTAL ATTENUATION PROVIDED = 653m³

PHASE C - BLOCK C6
POSITIVELY DRAINED AREA =148m²
STORM WATER DISCHARGE RATE = 0.25l/s
(SHARED FLOW CONTROL STRUCTURE WITH BOLCK C5 LIMITING FLOW TO TOTAL 1l/s)
REQUIRED ATTENUATION VOLUME = 10m³
BELOW GROUND CELLULAR ATTENUATION CRATE:
AREA=17.6m²
DEPTH =0.6 m (95% VOID RATIO)
VOLUME = 10.03m³

PHASE C - BLOCK C5
POSITIVELY DRAINED AREA =210m²
STORM WATER DISCHARGE RATE = 0.75l/s
(SHARED FLOW CONTROL STRUCTURE WITH BOLCK C6 LIMITING FLOW TO TOTAL 1l/s)
REQUIRED ATTENUATION VOLUME = 10m³
BELOW GROUND CELLULAR ATTENUATION CRATE:
AREA=17.6m²
DEPTH =0.6 m (95% VOID RATIO)
VOLUME = 10.03m³

PHASE C - BLOCK E1/E2/E3
POSITIVELY DRAINED AREA =5185m²
STORM WATER DISCHARGE RATE = 1.5l/s
REQUIRED ATTENUATION VOLUME = 562m³
BELOW GROUND CELLULAR ATTENUATION CRATES:
AREA =351.36m²
DEPTH = 1.2m (95% VOID RATIO)
VOLUME = 400.5m³
BLUE/GREEN ROOF:
VOLUME = 162m³

TOTAL ATTENUATION PROVIDED = 562.5m³

THAMES WATER SWS REF:3605
CL=n/a
IL=n/a
(SURVEY REQUIRED)

THAMES WATER SWS REF:3602
CL=3.75
IL=0.78

PHASE A - BLOCK J1
POSITIVELY DRAINED AREA = 2624m²
STORM WATER DISCHARGE RATE = 1.0l/s
REQUIRED ATTENUATION VOLUME = 260m³
CELLULAR ATTENUATION CRATES:
AREA = 228m²
DEPTH = 1.2m (95% VOID RATIO)
VOLUME = 260m³

THAMES WATER CWS REF:2536
CL=N/A
IL=N/A
(SURVEY REQUIRED)

THAMES WATER CWS REF:3501A
CL=N/A
IL=N/A
(SURVEY REQUIRED)

PHASE B - BLOCK B4
POSITIVELY DRAINED AREA = 1255m²
STORM WATER DISCHARGE RATE = 1l/s
REQUIRED ATTENUATION VOLUME = 97m³
CELLULAR ATTENUATION CRATES:
AREA = 68.8m²
DEPTH = 1.2m (95% VOID RATIO)
VOLUME = 78.4m³
BLUE/GREEN ROOF:
VOLUME = 19m³

TOTAL ATTENUATION PROVIDED = 97.4m³

THAMES WATER CWS REF:3516
CL=N/A
IL=N/A
(SURVEY REQUIRED)

THAMES WATER CWS REF:4407
CL=1.66
IL=-3.55

PHASE D - BLOCK D1/D2/D3/D4
POSITIVELY DRAINED AREA = 5310m²
STORM WATER DISCHARGE RATE = 1.5l/s
REQUIRED ATTENUATION VOLUME = 576m³
CELLULAR ATTENUATION CRATES:
AREA = 430m²
DEPTH = 1.2m (95% VOID RATIO)
VOLUME = 490.2m³
BLUE/GREEN ROOF:
VOLUME = 87m³

TOTAL PROVIDED ATTENUATION = 577.2m³

THAMES WATER CWS REF:4301A
CL=1.77
IL=-2.82

PHASE A - BLOCK F1
POSITIVELY DRAINED AREA = 2145m²
STORM WATER DISCHARGE RATE = 1.25l/s
REQUIRED ATTENUATION VOLUME = 185m³
CELLULAR ATTENUATION CRATES:
AREA = 114m²
DEPTH = 1.2m (95% VOID RATIO)
VOLUME = 130m³
BLUE/GREEN ROOF:
VOLUME = 56m³

TOTAL ATTENUATION PROVIDED = 185m³

THAMES WATER CWS REF:4302
CL=N/A
IL=N/A
(SURVEY REQUIRED)

THAMES WATER CWS REF:4312
CL=1.77
IL=-2.54

THAMES WATER CWS REF:4303
CL=N/A
IL=N/A
(SURVEY REQUIRED)

THAMES WATER CWS REF:4313
CL=2.00
IL=-1.04

PHASE A - BLOCK H3
POSITIVELY DRAINED AREA = 1700m²
STORM WATER DISCHARGE RATE = 1.25l/s
REQUIRED ATTENUATION VOLUME = 135m³
CELLULAR ATTENUATION CRATES:
AREA = 97.52m²
DEPTH = 1.2m (95% VOID RATIO)
VOLUME = 111.2m³
BLUE/GREEN ROOF:
VOLUME = 24m³

TOTAL ATTENUATION PROVIDED = 135.2m³

PHASE A - BLOCK H1/H2
POSITIVELY DRAINED AREA =2025m²
STORM WATER DISCHARGE RATE = 1.5l/s
REQUIRED ATTENUATION VOLUME = 161m³
BELOW GROUND CELLULAR ATTENUATION CRATES:
AREA =98.4m²
DEPTH = 1.2m (95% VOID RATIO)
VOLUME = 112m³
BLUE/GREEN ROOF:
VOLUME = 49m³

TOTAL ATTENUATION VOLUME PROVIDED = 161m³

THAMES WATER CWS REF:4215
CL=1.61
IL=-2.24

THAMES WATER CWS REF:2705
CL=N/A
IL=N/A
(SURVEY REQUIRED)

THAMES WATER CWS REF:2704
CL=N/A
IL=N/A
(SURVEY REQUIRED)

THAMES WATER CWS REF:3701
CL=N/A
IL=N/A
(SURVEY REQUIRED)

THAMES WATER CWS REF:7303
CL=N/A
IL=N/A
(SURVEY REQUIRED)

PHASE A - BLOCK I1
POSITIVELY DRAINED AREA = 905m²
STORM WATER DISCHARGE RATE = 1l/s
REQUIRED ATTENUATION VOLUME = 69m³
CELLULAR ATTENUATION CRATES:
AREA = 24m²
DEPTH = 1.5m (95% VOID RATIO)
VOLUME = 34.2m³
BLUE/GREEN ROOF:
VOLUME = 35m³

TOTAL ATTENUATION PROVIDED = 69.2m³

ISSUED FOR INFORMATION

REV	DESCRIPTION	BY	DATE
P01	STAGE 2 ISSUE	LH	20/08/21
P02	SUSTAINABILITY PRESENTATION	LB	25/08/21
P03	DRAFT STAGE 2+ ISSUED FOR PLANNING	LH	17/09/21
P04	ISSUED FOR PLANNING	LB	14/10/21
P05	REVISED PLANNING ISSUE	LB	07/03/22
P06	REVISED PLANNING ISSUE	LB	20/10/22

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR INFORMATION ONLY.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
5. PERMEABLE PAVING TO BE UTILIZED IN PRIVATELY MANAGED PUBLIC SPACE WHERE FEASIBLE.
6. THIS DRAWING IS BASED ON:
   - THAMES WATER ASSET RECORDS DATED NOVEMBER 2020
   - LEVITT BERNSTEIN ARCHITECTURAL MASTERPLAN3663 - LB - ZZ - 00 - DR - 000201 - Illustrative Scheme - Lower Ground Floor Plan - 1 AND - LB - ZZ - 28 - DR - 000206 - Illustrative Scheme - Roof Plan - 1 RECEIVED OCTOBER 2022
   - TOPOGRAPHICAL & UTILITIES COMBINED SURVEY FULL SITE V2

TOTAL DISCHARGE RATE FROM SITE IS EQUAL TO THE GREENFEILD RUNOFF RATE OF 22.4 L/S.

KEY:

- ASSUMED PROPERTY BOUNDARY
- PROPOSED SURFACE WATER SEWER
- EXISTING SURFACE WATER SEWER
- PROPOSED FOUL WATER SEWER
- EXISTING COMBINED WATER SEWER
- PROPOSED COMBINED WATER SEWER
- ABANDONED SEWER
- PROPOSED SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- PROPOSED FOUL WATER MANHOLE
- EXISTING COMBINED WATER SEWER
- PROPOSED COMBINED WATER MANHOLE
- PROPOSED BELOW GROUND SURFACE WATER ATTENUATION TANK
- SUDS PLANTER (BIO-RETENTION)
- ASSUMED POSITIVELY DRAINED BLOCK AREA
- PERMEABLE PAVING

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS

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PROJECT
ABERFELDY VILLAGE MASTERPLAN

CLIENT
ECOWORLD

TITLE
BELOW GROUND DRAINAGE MASTERPLAN

DISCIPLINE			SCALE
CIVIL			1:1000
DRAWN	DESIGNED	CHECKED	APPROVED
LH	LH	LB	LB
DRAWING No			ISSUE
2812-MHT-CV-BG-DR-100			P06

DATE: 20/10/2022
FILE LOCATION: \MEINHARDT-DC1\PROJECTDATA\PROJECTS\2812 - ABERFELDY VILLAGE\1. MHT\CIVIL\DRAWINGS\DRAWINGS\2812-MHT-CV-BG-DR-100.DWG