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Monarch House Barton Lane OX14 3NB	New Barn Lane Swale	
Date 13/02/2018 File SWALE.SRCX	Designed by S.Smith Checked by	
Innovyze	Source Control 2017.1.2	

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	3.770	0.223	1.0	96.0	O K
30 min Summer	3.835	0.288	1.0	128.7	O K
60 min Summer	3.902	0.355	1.1	164.0	O K
120 min Summer	3.966	0.419	1.1	200.5	O K
180 min Summer	4.001	0.454	1.2	221.2	O K
240 min Summer	4.023	0.476	1.2	234.6	O K
360 min Summer	4.052	0.505	1.2	252.5	O K
480 min Summer	4.071	0.524	1.2	264.3	O K
600 min Summer	4.084	0.537	1.3	272.4	O K
720 min Summer	4.092	0.545	1.3	278.0	O K
960 min Summer	4.102	0.555	1.3	284.3	O K
1440 min Summer	4.105	0.558	1.3	286.0	O K
2160 min Summer	4.091	0.544	1.3	277.3	O K
2880 min Summer	4.076	0.529	1.2	267.7	O K
4320 min Summer	4.050	0.503	1.2	251.3	O K
5760 min Summer	4.027	0.480	1.2	237.0	O K
7200 min Summer	4.005	0.458	1.2	223.6	O K
8640 min Summer	3.984	0.437	1.2	211.2	O K
10080 min Summer	3.964	0.417	1.1	199.3	O K
15 min Winter	3.794	0.247	1.0	107.7	O K
30 min Winter	3.865	0.318	1.0	144.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	124.633	0.0	80.8	27
30 min Summer	83.789	0.0	79.5	42
60 min Summer	53.779	0.0	165.8	72
120 min Summer	33.337	0.0	169.9	130
180 min Summer	24.832	0.0	173.8	190
240 min Summer	20.006	0.0	177.3	250
360 min Summer	14.706	0.0	183.8	368
480 min Summer	11.818	0.0	188.2	488
600 min Summer	9.966	0.0	191.2	606
720 min Summer	8.665	0.0	193.4	726
960 min Summer	6.943	0.0	195.9	964
1440 min Summer	5.071	0.0	197.0	1442
2160 min Summer	3.696	0.0	366.3	1868
2880 min Summer	2.949	0.0	365.6	2252
4320 min Summer	2.142	0.0	354.9	3032
5760 min Summer	1.705	0.0	511.6	3864
7200 min Summer	1.427	0.0	535.4	4688
8640 min Summer	1.235	0.0	556.1	5528
10080 min Summer	1.093	0.0	574.3	6352
15 min Winter	124.633	0.0	79.8	27
30 min Winter	83.789	0.0	80.5	41

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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	3.938	0.391	1.1	184.2	O K
120 min Winter	4.009	0.462	1.2	225.6	O K
180 min Winter	4.047	0.500	1.2	249.2	O K
240 min Winter	4.072	0.525	1.2	264.7	O K
360 min Winter	4.104	0.557	1.3	285.7	O K
480 min Winter	4.126	0.579	1.3	300.0	O K
600 min Winter	4.141	0.594	1.3	310.0	O K
720 min Winter	4.152	0.605	1.3	317.3	O K
960 min Winter	4.165	0.618	1.3	326.4	O K
1440 min Winter	4.174	0.627	1.3	332.4	O K
2160 min Winter	4.166	0.619	1.3	327.1	O K
2880 min Winter	4.149	0.602	1.3	315.1	O K
4320 min Winter	4.116	0.569	1.3	293.7	O K
5760 min Winter	4.085	0.538	1.3	273.0	O K
7200 min Winter	4.054	0.507	1.2	253.4	O K
8640 min Winter	4.024	0.477	1.2	234.7	O K
10080 min Winter	3.994	0.447	1.2	217.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	53.779	0.0	167.8	70
120 min Winter	33.337	0.0	174.2	128
180 min Winter	24.832	0.0	180.6	186
240 min Winter	20.006	0.0	185.8	246
360 min Winter	14.706	0.0	192.5	362
480 min Winter	11.818	0.0	196.8	480
600 min Winter	9.966	0.0	199.6	596
720 min Winter	8.665	0.0	201.6	712
960 min Winter	6.943	0.0	203.7	942
1440 min Winter	5.071	0.0	203.7	1396
2160 min Winter	3.696	0.0	382.4	2040
2880 min Winter	2.949	0.0	384.1	2368
4320 min Winter	2.142	0.0	373.3	3248
5760 min Winter	1.705	0.0	572.9	4168
7200 min Winter	1.427	0.0	599.4	5112
8640 min Winter	1.235	0.0	622.8	5968
10080 min Winter	1.093	0.0	611.6	6856

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

Time Area Diagram

Total Area (ha) 0.417

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4 0.139	4	8 0.139	8	12 0.139

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Model Details

Storage is Online Cover Level (m) 5.000

Tank or Pond Structure

Invert Level (m) 3.547

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	376.4	0.700	725.9	1.400	1103.1	2.100	0.0
0.100	424.6	0.800	778.1	1.500	1159.2	2.200	0.0
0.200	473.4	0.900	830.8	1.501	0.0	2.300	0.0
0.300	522.8	1.000	884.2	1.700	0.0	2.400	0.0
0.400	572.7	1.100	938.0	1.800	0.0	2.500	0.0
0.500	623.2	1.200	992.5	1.900	0.0		
0.600	674.3	1.300	1047.5	2.000	0.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0056-1000-0360-1000
Design Head (m)	0.360
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	56
Invert Level (m)	3.487
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.360	1.0
Flush-Flo™	0.104	1.0
Kick-Flo®	0.250	0.9
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)
0.100	1.0	1.200	1.7	3.000	2.6	7.000	4.0
0.200	0.9	1.400	1.8	3.500	2.8	7.500	4.1
0.300	0.9	1.600	2.0	4.000	3.0	8.000	4.2
0.400	1.0	1.800	2.1	4.500	3.2	8.500	4.4
0.500	1.2	2.000	2.2	5.000	3.3	9.000	4.5
0.600	1.3	2.200	2.3	5.500	3.5	9.500	4.6
0.800	1.4	2.400	2.4	6.000	3.7		
1.000	1.6	2.600	2.4	6.500	3.8		