

MJA Consulting							Page 2																																																																																																																																																																																																																																																																																														
Monarch House Barton Lane OX14 3NB			Phase 2 Manor Farm Bedhampton Pond + Boreholes																																																																																																																																																																																																																																																																																																		
Date 21/06/2022 File Cascade.CASX			Designed by S.Smith Checked by																																																																																																																																																																																																																																																																																																		
Innovyze			Source Control 2020.1																																																																																																																																																																																																																																																																																																		
<u>Cascade Summary of Results for Pond.SRCX</u> <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Control (l/s)</th><th>Max E Outflow (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>8640 min Summer</td><td>6.401</td><td>1.001</td><td>0.0</td><td>0.8</td><td>0.8</td><td>693.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>6.384</td><td>0.984</td><td>0.0</td><td>0.8</td><td>0.8</td><td>678.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>5.762</td><td>0.362</td><td>0.0</td><td>0.7</td><td>0.7</td><td>206.6</td><td>O K</td></tr><tr><td>30 min Winter</td><td>5.870</td><td>0.470</td><td>0.0</td><td>0.7</td><td>0.7</td><td>277.7</td><td>O K</td></tr><tr><td>60 min Winter</td><td>5.981</td><td>0.581</td><td>0.0</td><td>0.7</td><td>0.7</td><td>355.6</td><td>O K</td></tr><tr><td>120 min Winter</td><td>6.093</td><td>0.693</td><td>0.0</td><td>0.8</td><td>0.8</td><td>438.6</td><td>O K</td></tr><tr><td>180 min Winter</td><td>6.156</td><td>0.756</td><td>0.0</td><td>0.8</td><td>0.8</td><td>487.5</td><td>O K</td></tr><tr><td>240 min Winter</td><td>6.198</td><td>0.798</td><td>0.0</td><td>0.8</td><td>0.8</td><td>521.1</td><td>O K</td></tr><tr><td>360 min Winter</td><td>6.259</td><td>0.859</td><td>0.0</td><td>0.8</td><td>0.8</td><td>571.2</td><td>O K</td></tr><tr><td>480 min Winter</td><td>6.303</td><td>0.903</td><td>0.0</td><td>0.8</td><td>0.8</td><td>608.0</td><td>O K</td></tr><tr><td>600 min Winter</td><td>6.337</td><td>0.937</td><td>0.0</td><td>0.8</td><td>0.8</td><td>636.8</td><td>O K</td></tr><tr><td>720 min Winter</td><td>6.364</td><td>0.964</td><td>0.0</td><td>0.8</td><td>0.8</td><td>660.4</td><td>O K</td></tr><tr><td>960 min Winter</td><td>6.406</td><td>1.006</td><td>0.0</td><td>0.8</td><td>0.8</td><td>697.3</td><td>O K</td></tr><tr><td>1440 min Winter</td><td>6.461</td><td>1.061</td><td>0.0</td><td>0.8</td><td>0.8</td><td>747.1</td><td>O K</td></tr><tr><td>2160 min Winter</td><td>6.509</td><td>1.109</td><td>0.0</td><td>0.8</td><td>0.8</td><td>791.2</td><td>O K</td></tr><tr><td>2880 min Winter</td><td>6.536</td><td>1.136</td><td>0.0</td><td>0.8</td><td>0.8</td><td>816.5</td><td>O K</td></tr><tr><td>4320 min Winter</td><td>6.559</td><td>1.159</td><td>0.0</td><td>0.8</td><td>0.8</td><td>838.7</td><td>O K</td></tr><tr><td>5760 min Winter</td><td>6.561</td><td>1.161</td><td>0.0</td><td>0.8</td><td>0.8</td><td>840.8</td><td>O K</td></tr><tr><td>7200 min Winter</td><td>6.553</td><td>1.153</td><td>0.0</td><td>0.8</td><td>0.8</td><td>832.4</td><td>O K</td></tr><tr><td>8640 min Winter</td><td>6.539</td><td>1.139</td><td>0.0</td><td>0.8</td><td>0.8</td><td>819.1</td><td>O K</td></tr><tr><td>10080 min Winter</td><td>6.520</td><td>1.120</td><td>0.0</td><td>0.8</td><td>0.8</td><td>801.9</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>8640 min Summer</td><td>1.255</td><td>0.0</td><td>505.5</td><td>7368</td></tr><tr><td>10080 min Summer</td><td>1.111</td><td>0.0</td><td>495.9</td><td>8088</td></tr><tr><td>15 min Winter</td><td>127.517</td><td>0.0</td><td>57.4</td><td>47</td></tr><tr><td>30 min Winter</td><td>85.701</td><td>0.0</td><td>59.7</td><td>61</td></tr><tr><td>60 min Winter</td><td>54.957</td><td>0.0</td><td>122.3</td><td>90</td></tr><tr><td>120 min Winter</td><td>34.010</td><td>0.0</td><td>126.5</td><td>148</td></tr><tr><td>180 min Winter</td><td>25.295</td><td>0.0</td><td>128.7</td><td>206</td></tr><tr><td>240 min Winter</td><td>20.351</td><td>0.0</td><td>130.0</td><td>266</td></tr><tr><td>360 min Winter</td><td>14.971</td><td>0.0</td><td>131.7</td><td>382</td></tr><tr><td>480 min Winter</td><td>12.028</td><td>0.0</td><td>132.6</td><td>500</td></tr><tr><td>600 min Winter</td><td>10.141</td><td>0.0</td><td>133.2</td><td>618</td></tr><tr><td>720 min Winter</td><td>8.817</td><td>0.0</td><td>133.4</td><td>734</td></tr><tr><td>960 min Winter</td><td>7.063</td><td>0.0</td><td>133.5</td><td>970</td></tr><tr><td>1440 min Winter</td><td>5.157</td><td>0.0</td><td>132.2</td><td>1440</td></tr><tr><td>2160 min Winter</td><td>3.757</td><td>0.0</td><td>269.7</td><td>2144</td></tr><tr><td>2880 min Winter</td><td>2.997</td><td>0.0</td><td>267.4</td><td>2844</td></tr><tr><td>4320 min Winter</td><td>2.176</td><td>0.0</td><td>259.7</td><td>4220</td></tr><tr><td>5760 min Winter</td><td>1.731</td><td>0.0</td><td>531.7</td><td>5584</td></tr><tr><td>7200 min Winter</td><td>1.449</td><td>0.0</td><td>524.1</td><td>6912</td></tr><tr><td>8640 min Winter</td><td>1.255</td><td>0.0</td><td>514.6</td><td>8144</td></tr><tr><td>10080 min Winter</td><td>1.111</td><td>0.0</td><td>503.4</td><td>9304</td></tr></table>								Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status	8640 min Summer	6.401	1.001	0.0	0.8	0.8	693.3	O K	10080 min Summer	6.384	0.984	0.0	0.8	0.8	678.2	O K	15 min Winter	5.762	0.362	0.0	0.7	0.7	206.6	O K	30 min Winter	5.870	0.470	0.0	0.7	0.7	277.7	O K	60 min Winter	5.981	0.581	0.0	0.7	0.7	355.6	O K	120 min Winter	6.093	0.693	0.0	0.8	0.8	438.6	O K	180 min Winter	6.156	0.756	0.0	0.8	0.8	487.5	O K	240 min Winter	6.198	0.798	0.0	0.8	0.8	521.1	O K	360 min Winter	6.259	0.859	0.0	0.8	0.8	571.2	O K	480 min Winter	6.303	0.903	0.0	0.8	0.8	608.0	O K	600 min Winter	6.337	0.937	0.0	0.8	0.8	636.8	O K	720 min Winter	6.364	0.964	0.0	0.8	0.8	660.4	O K	960 min Winter	6.406	1.006	0.0	0.8	0.8	697.3	O K	1440 min Winter	6.461	1.061	0.0	0.8	0.8	747.1	O K	2160 min Winter	6.509	1.109	0.0	0.8	0.8	791.2	O K	2880 min Winter	6.536	1.136	0.0	0.8	0.8	816.5	O K	4320 min Winter	6.559	1.159	0.0	0.8	0.8	838.7	O K	5760 min Winter	6.561	1.161	0.0	0.8	0.8	840.8	O K	7200 min Winter	6.553	1.153	0.0	0.8	0.8	832.4	O K	8640 min Winter	6.539	1.139	0.0	0.8	0.8	819.1	O K	10080 min Winter	6.520	1.120	0.0	0.8	0.8	801.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	8640 min Summer	1.255	0.0	505.5	7368	10080 min Summer	1.111	0.0	495.9	8088	15 min Winter	127.517	0.0	57.4	47	30 min Winter	85.701	0.0	59.7	61	60 min Winter	54.957	0.0	122.3	90	120 min Winter	34.010	0.0	126.5	148	180 min Winter	25.295	0.0	128.7	206	240 min Winter	20.351	0.0	130.0	266	360 min Winter	14.971	0.0	131.7	382	480 min Winter	12.028	0.0	132.6	500	600 min Winter	10.141	0.0	133.2	618	720 min Winter	8.817	0.0	133.4	734	960 min Winter	7.063	0.0	133.5	970	1440 min Winter	5.157	0.0	132.2	1440	2160 min Winter	3.757	0.0	269.7	2144	2880 min Winter	2.997	0.0	267.4	2844	4320 min Winter	2.176	0.0	259.7	4220	5760 min Winter	1.731	0.0	531.7	5584	7200 min Winter	1.449	0.0	524.1	6912	8640 min Winter	1.255	0.0	514.6	8144	10080 min Winter	1.111	0.0	503.4	9304
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status																																																																																																																																																																																																																																																																																														
8640 min Summer	6.401	1.001	0.0	0.8	0.8	693.3	O K																																																																																																																																																																																																																																																																																														
10080 min Summer	6.384	0.984	0.0	0.8	0.8	678.2	O K																																																																																																																																																																																																																																																																																														
15 min Winter	5.762	0.362	0.0	0.7	0.7	206.6	O K																																																																																																																																																																																																																																																																																														
30 min Winter	5.870	0.470	0.0	0.7	0.7	277.7	O K																																																																																																																																																																																																																																																																																														
60 min Winter	5.981	0.581	0.0	0.7	0.7	355.6	O K																																																																																																																																																																																																																																																																																														
120 min Winter	6.093	0.693	0.0	0.8	0.8	438.6	O K																																																																																																																																																																																																																																																																																														
180 min Winter	6.156	0.756	0.0	0.8	0.8	487.5	O K																																																																																																																																																																																																																																																																																														
240 min Winter	6.198	0.798	0.0	0.8	0.8	521.1	O K																																																																																																																																																																																																																																																																																														
360 min Winter	6.259	0.859	0.0	0.8	0.8	571.2	O K																																																																																																																																																																																																																																																																																														
480 min Winter	6.303	0.903	0.0	0.8	0.8	608.0	O K																																																																																																																																																																																																																																																																																														
600 min Winter	6.337	0.937	0.0	0.8	0.8	636.8	O K																																																																																																																																																																																																																																																																																														
720 min Winter	6.364	0.964	0.0	0.8	0.8	660.4	O K																																																																																																																																																																																																																																																																																														
960 min Winter	6.406	1.006	0.0	0.8	0.8	697.3	O K																																																																																																																																																																																																																																																																																														
1440 min Winter	6.461	1.061	0.0	0.8	0.8	747.1	O K																																																																																																																																																																																																																																																																																														
2160 min Winter	6.509	1.109	0.0	0.8	0.8	791.2	O K																																																																																																																																																																																																																																																																																														
2880 min Winter	6.536	1.136	0.0	0.8	0.8	816.5	O K																																																																																																																																																																																																																																																																																														
4320 min Winter	6.559	1.159	0.0	0.8	0.8	838.7	O K																																																																																																																																																																																																																																																																																														
5760 min Winter	6.561	1.161	0.0	0.8	0.8	840.8	O K																																																																																																																																																																																																																																																																																														
7200 min Winter	6.553	1.153	0.0	0.8	0.8	832.4	O K																																																																																																																																																																																																																																																																																														
8640 min Winter	6.539	1.139	0.0	0.8	0.8	819.1	O K																																																																																																																																																																																																																																																																																														
10080 min Winter	6.520	1.120	0.0	0.8	0.8	801.9	O K																																																																																																																																																																																																																																																																																														
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																																																																																																	
8640 min Summer	1.255	0.0	505.5	7368																																																																																																																																																																																																																																																																																																	
10080 min Summer	1.111	0.0	495.9	8088																																																																																																																																																																																																																																																																																																	
15 min Winter	127.517	0.0	57.4	47																																																																																																																																																																																																																																																																																																	
30 min Winter	85.701	0.0	59.7	61																																																																																																																																																																																																																																																																																																	
60 min Winter	54.957	0.0	122.3	90																																																																																																																																																																																																																																																																																																	
120 min Winter	34.010	0.0	126.5	148																																																																																																																																																																																																																																																																																																	
180 min Winter	25.295	0.0	128.7	206																																																																																																																																																																																																																																																																																																	
240 min Winter	20.351	0.0	130.0	266																																																																																																																																																																																																																																																																																																	
360 min Winter	14.971	0.0	131.7	382																																																																																																																																																																																																																																																																																																	
480 min Winter	12.028	0.0	132.6	500																																																																																																																																																																																																																																																																																																	
600 min Winter	10.141	0.0	133.2	618																																																																																																																																																																																																																																																																																																	
720 min Winter	8.817	0.0	133.4	734																																																																																																																																																																																																																																																																																																	
960 min Winter	7.063	0.0	133.5	970																																																																																																																																																																																																																																																																																																	
1440 min Winter	5.157	0.0	132.2	1440																																																																																																																																																																																																																																																																																																	
2160 min Winter	3.757	0.0	269.7	2144																																																																																																																																																																																																																																																																																																	
2880 min Winter	2.997	0.0	267.4	2844																																																																																																																																																																																																																																																																																																	
4320 min Winter	2.176	0.0	259.7	4220																																																																																																																																																																																																																																																																																																	
5760 min Winter	1.731	0.0	531.7	5584																																																																																																																																																																																																																																																																																																	
7200 min Winter	1.449	0.0	524.1	6912																																																																																																																																																																																																																																																																																																	
8640 min Winter	1.255	0.0	514.6	8144																																																																																																																																																																																																																																																																																																	
10080 min Winter	1.111	0.0	503.4	9304																																																																																																																																																																																																																																																																																																	
©1982-2020 Innovyze																																																																																																																																																																																																																																																																																																					

MJA Consulting		Page 3
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes	
Date 21/06/2022 File Cascade.CASX	Designed by S.Smith Checked by	
Innovyze Source Control 2020.1		

Cascade Rainfall Details for Pond.SRCX

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)	19.400	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.778

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:	From:	To:
0	4 0.100	8	12 0.100	16	20 0.100	24	28 0.100
4	8 0.100	12	16 0.100	20	24 0.100	28	32 0.078

©1982-2020 Innovyze

MJA Consulting		Page 4
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes	
Date 21/06/2022 File Cascade.CASX	Designed by S.Smith Checked by	

Innovyze

Source Control 2020.1

Cascade Model Details for Pond.SRCX

Storage is Online Cover Level (m) 7.000

Infiltration Basin Structure

Invert Level (m) 5.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	506.0	0.500	690.0	1.000	888.0	1.500	1100.0
0.100	542.0	0.600	728.0	1.100	929.0	1.600	1144.0
0.200	578.0	0.700	767.0	1.200	971.0		
0.300	615.0	0.800	807.0	1.300	1013.0		
0.400	651.0	0.900	847.0	1.400	1056.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0036-7000-1300-7000
Design Head (m) 1.300
Design Flow (l/s) 0.7
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 36
Invert Level (m) 4.550
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)	1.300	0.7	Kick-Flo®	0.325	0.4
Flush-Flo™	0.160	0.5	Mean Flow over Head Range	-	0.5

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	0.4	1.200	0.7	3.000	1.0	7.000	1.5
0.200	0.5	1.400	0.7	3.500	1.1	7.500	1.5
0.300	0.4	1.600	0.8	4.000	1.2	8.000	1.6
0.400	0.4	1.800	0.8	4.500	1.2	8.500	1.6
0.500	0.5	2.000	0.8	5.000	1.3	9.000	1.7
0.600	0.5	2.200	0.9	5.500	1.3	9.500	1.7
0.800	0.6	2.400	0.9	6.000	1.4		
1.000	0.6	2.600	1.0	6.500	1.4		

MJA Consulting		Page 1
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes	
Date 01/11/2022 File Cascade.CASX	Designed by S.Smith Checked by CP	
Innovyze Source Control 2020.1		

Cascade Summary of Results for Deep Borehole Soakaway.SRCX

Upstream Structures	Outflow To	Overflow To
Pond.SRCX	(None)	Deep Borehole Soakaway 2.SRCX

Half Drain Time : 121 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	99.623	50.123	0.4	0.3	0.7	3.7	O K
30 min Summer	99.624	50.124	0.4	0.4	0.7	3.7	O K
60 min Summer	99.625	50.125	0.4	0.4	0.7	3.7	O K
120 min Summer	99.626	50.126	0.4	0.4	0.8	3.7	O K
180 min Summer	99.626	50.126	0.4	0.4	0.8	3.7	O K
240 min Summer	99.626	50.126	0.4	0.4	0.8	3.7	O K
360 min Summer	99.627	50.127	0.4	0.4	0.8	3.7	O K
480 min Summer	99.627	50.127	0.4	0.4	0.8	3.7	O K
600 min Summer	99.627	50.127	0.4	0.4	0.8	3.7	O K
720 min Summer	99.627	50.127	0.4	0.4	0.8	3.7	O K
960 min Summer	99.628	50.128	0.4	0.5	0.8	3.7	O K
1440 min Summer	99.628	50.128	0.4	0.5	0.8	3.7	O K
2160 min Summer	99.628	50.128	0.4	0.5	0.8	3.7	O K
2880 min Summer	99.628	50.128	0.4	0.5	0.8	3.7	O K
4320 min Summer	99.629	50.129	0.4	0.5	0.8	3.7	O K
5760 min Summer	99.629	50.129	0.4	0.5	0.8	3.7	O K
7200 min Summer	99.629	50.129	0.4	0.5	0.8	3.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	127.517	0.0	24.0	141
30 min Summer	85.701	0.0	26.0	276
60 min Summer	54.957	0.0	57.1	132
120 min Summer	34.010	0.0	61.2	136
180 min Summer	25.295	0.0	63.3	354
240 min Summer	20.351	0.0	64.6	298
360 min Summer	14.971	0.0	66.3	598
480 min Summer	12.028	0.0	67.2	568
600 min Summer	10.141	0.0	67.8	954
720 min Summer	8.817	0.0	68.1	744
960 min Summer	7.063	0.0	68.2	1182
1440 min Summer	5.157	0.0	67.3	1440
2160 min Summer	3.757	0.0	141.0	2128
2880 min Summer	2.997	0.0	139.1	2484
4320 min Summer	2.176	0.0	132.4	4176
5760 min Summer	1.731	0.0	275.8	5760
7200 min Summer	1.449	0.0	269.5	5288

©1982-2020 Innovyze

MJA Consulting							Page 2
Monarch House Barton Lane OX14 3NB			Phase 2 Manor Farm Bedhampton Pond + Boreholes				
Date 01/11/2022 File Cascade.CASX			Designed by S.Smith Checked by CP				
Innovyze			Source Control 2020.1				
<u>Cascade Summary of Results for Deep Borehole Soakaway.SRCX</u>							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
8640 min Summer	99.629	50.129	0.4	0.5	0.8	3.7	O K
10080 min Summer	99.629	50.129	0.4	0.5	0.8	3.7	O K
15 min Winter	99.624	50.124	0.4	0.3	0.7	3.7	O K
30 min Winter	99.624	50.124	0.4	0.4	0.7	3.7	O K
60 min Winter	99.625	50.125	0.4	0.4	0.7	3.7	O K
120 min Winter	99.626	50.126	0.4	0.4	0.8	3.7	O K
180 min Winter	99.627	50.127	0.4	0.4	0.8	3.7	O K
240 min Winter	99.627	50.127	0.4	0.4	0.8	3.7	O K
360 min Winter	99.627	50.127	0.4	0.4	0.8	3.7	O K
480 min Winter	99.628	50.128	0.4	0.5	0.8	3.7	O K
600 min Winter	99.628	50.128	0.4	0.5	0.8	3.7	O K
720 min Winter	99.628	50.128	0.4	0.5	0.8	3.7	O K
960 min Winter	99.628	50.128	0.4	0.5	0.8	3.7	O K
1440 min Winter	99.629	50.129	0.4	0.5	0.8	3.7	O K
2160 min Winter	99.629	50.129	0.4	0.5	0.8	3.7	O K
2880 min Winter	99.629	50.129	0.4	0.5	0.9	3.7	O K
4320 min Winter	99.629	50.129	0.4	0.5	0.9	3.7	O K
5760 min Winter	99.630	50.130	0.4	0.5	0.9	3.7	O K
7200 min Winter	99.629	50.129	0.4	0.5	0.9	3.7	O K
8640 min Winter	99.630	50.130	0.4	0.5	0.9	3.7	O K
10080 min Winter	99.630	50.130	0.4	0.5	0.9	3.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
8640 min Summer	1.255	0.0	261.4	8112			
10080 min Summer	1.111	0.0	251.9	10288			
15 min Winter	127.517	0.0	24.7	143			
30 min Winter	85.701	0.0	26.9	133			
60 min Winter	54.957	0.0	59.3	166			
120 min Winter	34.010	0.0	63.6	134			
180 min Winter	25.295	0.0	65.8	528			
240 min Winter	20.351	0.0	67.2	264			
360 min Winter	14.971	0.0	68.9	306			
480 min Winter	12.028	0.0	69.9	790			
600 min Winter	10.141	0.0	70.5	984			
720 min Winter	8.817	0.0	70.8	812			
960 min Winter	7.063	0.0	70.9	1722			
1440 min Winter	5.157	0.0	69.8	1524			
2160 min Winter	3.757	0.0	146.9	2108			
2880 min Winter	2.997	0.0	144.8	3208			
4320 min Winter	2.176	0.0	137.4	4100			
5760 min Winter	1.731	0.0	288.9	5208			
7200 min Winter	1.449	0.0	281.9	6992			
8640 min Winter	1.255	0.0	273.1	6640			
10080 min Winter	1.111	0.0	262.6	9704			
©1982-2020 Innovyze							

MJA Consulting		Page 3																														
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes																															
Date 01/11/2022 File Cascade.CASX	Designed by S.Smith Checked by CP																															
Innovyze		Source Control 2020.1																														
<u>Cascade Rainfall Details for Deep Borehole Soakaway.SRCX</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>19.400</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.350</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.000 <table> <tr> <td>Time (mins)</td> <td>Area</td> </tr> <tr> <td>From: To: (ha)</td> <td></td> </tr> <tr> <td>0</td> <td>4 0.000</td> </tr> </table>			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)	19.400	Shortest Storm (mins)	15	Ratio R	0.350	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	From: To: (ha)		0	4 0.000
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)	19.400	Shortest Storm (mins)	15																													
Ratio R	0.350	Longest Storm (mins)	10080																													
Summer Storms	Yes	Climate Change %	+40																													
Time (mins)	Area																															
From: To: (ha)																																
0	4 0.000																															
©1982-2020 Innovyze																																

MJA Consulting		Page 4
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes	
Date 01/11/2022 File Cascade.CASX	Designed by S.Smith Checked by CP	
Innovyze Source Control 2020.1		

Cascade Model Details for Deep Borehole Soakaway.SRCX

Storage is Online Cover Level (m) 100.000

Deep Bore Soakaway Structure

Chamber Invert Level (m) 99.500 Infiltration Coefficient Base (m/hr) 0.05328
 Chamber Diameter/Length (m) 1.200 Safety Factor 2.0
 Borehole Diameter (m) 0.300
 Borehole Depth (m) 50.000

Depth (m)	Side Infil. Coef. (m/hr)	Depth (m)	Side Infil. Coef. (m/hr)
0.000	0.05328	50.000	0.05328

Orifice Overflow Control

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 99.600

©1982-2020 Innovyze

MJA Consulting

Monarch House
Barton Lane
OX14 3NB

Phase 2 Manor Farm
Bedhampton
Pond + Boreholes

Date 01/11/2022
File Cascade.CASX

Designed by S.Smith
Checked by CP

Page 1



Innovyze

Source Control 2020.1

Cascade Summary of Results for Deep Borehole Soakaway 2.SRCX

Upstream Structures

Deep Borehole Soakaway.SRCX
Pond.SRCX

Outflow To

(None)

Overflow To

Deep Borehole Soakaway 3.SRCX

Half Drain Time : 117 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	92.969	43.469	0.3	0.0	0.3	3.1	O K
30 min Summer	96.559	47.059	0.3	0.0	0.3	3.3	O K
60 min Summer	99.601	50.101	0.3	0.0	0.4	3.6	O K
120 min Summer	99.608	50.108	0.3	0.0	0.4	3.7	O K
180 min Summer	99.609	50.109	0.4	0.1	0.4	3.7	O K
240 min Summer	99.610	50.110	0.4	0.1	0.4	3.7	O K
360 min Summer	99.611	50.111	0.4	0.1	0.4	3.7	O K
480 min Summer	99.611	50.111	0.4	0.1	0.4	3.7	O K
600 min Summer	99.611	50.111	0.4	0.1	0.4	3.7	O K
720 min Summer	99.612	50.112	0.4	0.1	0.4	3.7	O K
960 min Summer	99.612	50.112	0.4	0.1	0.5	3.7	O K
1440 min Summer	99.613	50.113	0.4	0.1	0.5	3.7	O K
2160 min Summer	99.613	50.113	0.4	0.1	0.5	3.7	O K
2880 min Summer	99.614	50.114	0.4	0.1	0.5	3.7	O K
4320 min Summer	99.614	50.114	0.4	0.1	0.5	3.7	O K
5760 min Summer	99.614	50.114	0.4	0.1	0.5	3.7	O K
7200 min Summer	99.614	50.114	0.4	0.1	0.5	3.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	127.517	0.0	0.0	940
30 min Summer	85.701	0.0	0.0	954
60 min Summer	54.957	0.0	0.0	1176
120 min Summer	34.010	0.0	2.5	604
180 min Summer	25.295	0.0	4.6	668
240 min Summer	20.351	0.0	6.0	680
360 min Summer	14.971	0.0	8.0	690
480 min Summer	12.028	0.0	9.4	942
600 min Summer	10.141	0.0	10.3	754
720 min Summer	8.817	0.0	11.0	812
960 min Summer	7.063	0.0	11.8	966
1440 min Summer	5.157	0.0	12.1	1488
2160 min Summer	3.757	0.0	27.1	2108
2880 min Summer	2.997	0.0	27.0	3352
4320 min Summer	2.176	0.0	23.9	4076
5760 min Summer	1.731	0.0	50.2	5672
7200 min Summer	1.449	0.0	48.1	7648

©1982-2020 Innovyze

MJA Consulting		Page 2
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes	
Date 01/11/2022 File Cascade.CASX	Designed by S.Smith Checked by CP	

Innovyze Source Control 2020.1

Cascade Summary of Results for Deep Borehole Soakaway 2.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
8640 min Summer	99.614	50.114	0.4	0.1	0.5	3.7	O K
10080 min Summer	99.613	50.113	0.4	0.1	0.5	3.7	O K
15 min Winter	94.262	44.762	0.3	0.0	0.3	3.2	O K
30 min Winter	98.127	48.627	0.3	0.0	0.3	3.4	O K
60 min Winter	99.606	50.106	0.3	0.0	0.4	3.7	O K
120 min Winter	99.609	50.109	0.4	0.1	0.4	3.7	O K
180 min Winter	99.610	50.110	0.4	0.1	0.4	3.7	O K
240 min Winter	99.611	50.111	0.4	0.1	0.4	3.7	O K
360 min Winter	99.611	50.111	0.4	0.1	0.4	3.7	O K
480 min Winter	99.612	50.112	0.4	0.1	0.5	3.7	O K
600 min Winter	99.612	50.112	0.4	0.1	0.5	3.7	O K
720 min Winter	99.613	50.113	0.4	0.1	0.5	3.7	O K
960 min Winter	99.613	50.113	0.4	0.1	0.5	3.7	O K
1440 min Winter	99.614	50.114	0.4	0.1	0.5	3.7	O K
2160 min Winter	99.615	50.115	0.4	0.2	0.5	3.7	O K
2880 min Winter	99.615	50.115	0.4	0.2	0.5	3.7	O K
4320 min Winter	99.615	50.115	0.4	0.2	0.5	3.7	O K
5760 min Winter	99.616	50.116	0.4	0.2	0.5	3.7	O K
7200 min Winter	99.616	50.116	0.4	0.2	0.5	3.7	O K
8640 min Winter	99.615	50.115	0.4	0.2	0.5	3.7	O K
10080 min Winter	99.615	50.115	0.4	0.2	0.5	3.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
8640 min Summer	1.255	0.0	44.6	8440
10080 min Summer	1.111	0.0	40.0	8352
15 min Winter	127.517	0.0	0.0	935
30 min Winter	85.701	0.0	0.0	972
60 min Winter	54.957	0.0	0.9	690
120 min Winter	34.010	0.0	4.7	562
180 min Winter	25.295	0.0	6.9	712
240 min Winter	20.351	0.0	8.4	632
360 min Winter	14.971	0.0	10.5	824
480 min Winter	12.028	0.0	12.0	502
600 min Winter	10.141	0.0	12.9	978
720 min Winter	8.817	0.0	13.6	1018
960 min Winter	7.063	0.0	14.4	1066
1440 min Winter	5.157	0.0	14.5	1464
2160 min Winter	3.757	0.0	32.8	2148
2880 min Winter	2.997	0.0	32.3	3184
4320 min Winter	2.176	0.0	28.5	4376
5760 min Winter	1.731	0.0	62.6	5720
7200 min Winter	1.449	0.0	59.7	7536
8640 min Winter	1.255	0.0	55.2	7008
10080 min Winter	1.111	0.0	49.5	8560

MJA Consulting		Page 3
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes	
Date 01/11/2022 File Cascade.CASX	Designed by S.Smith Checked by CP	
Innovyze Source Control 2020.1		

Cascade Rainfall Details for Deep Borehole Soakaway 2.SRCX

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)	19.400	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To:	(ha)
0	4 0.000

©1982-2020 Innovyze

MJA Consulting		Page 4
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes	
Date 01/11/2022 File Cascade.CASX	Designed by S.Smith Checked by CP	
Innovyze Source Control 2020.1		

Cascade Model Details for Deep Borehole Soakaway 2.SRCX

Storage is Online Cover Level (m) 100.000

Deep Bore Soakaway Structure

Chamber Invert Level (m) 99.500 Infiltration Coefficient Base (m/hr) 0.05328
 Chamber Diameter/Length (m) 1.200 Safety Factor 2.0
 Borehole Diameter (m) 0.300
 Borehole Depth (m) 50.000

Depth (m)	Side Infil. Coef. (m/hr)	Depth (m)	Side Infil. Coef. (m/hr)
0.000	0.05328	50.000	0.05328

Orifice Overflow Control

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 99.600

©1982-2020 Innovyze

MJA Consulting			Page 1		
Monarch House Barton Lane OX14 3NB		Phase 2 Manor Farm Bedhampton Pond + Boreholes			
Date 01/11/2022 File Cascade.CASX		Designed by S.Smith Checked by CP			
Innovyze		Source Control 2020.1			
<u>Cascade Summary of Results for Deep Borehole Soakaway 3.SRCX</u>					
Upstream Structures		Outflow To Overflow To			
Deep Borehole Soakaway 2.SRCX		(None)		(None)	
Deep Borehole Soakaway.SRCX					
Pond.SRCX					
Half Drain Time : 113 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	49.500	0.000	0.0	0.0	O K
30 min Summer	49.500	0.000	0.0	0.0	O K
60 min Summer	49.527	0.027	0.0	0.0	O K
120 min Summer	53.366	3.866	0.0	0.3	O K
180 min Summer	55.345	5.845	0.0	0.4	O K
240 min Summer	56.663	7.163	0.1	0.5	O K
360 min Summer	58.563	9.063	0.1	0.6	O K
480 min Summer	59.929	10.429	0.1	0.7	O K
600 min Summer	60.974	11.474	0.1	0.8	O K
720 min Summer	61.814	12.314	0.1	0.9	O K
960 min Summer	63.090	13.590	0.1	1.0	O K
1440 min Summer	64.723	15.223	0.1	1.1	O K
2160 min Summer	66.064	16.564	0.1	1.2	O K
2880 min Summer	66.746	17.246	0.1	1.2	O K
4320 min Summer	67.241	17.741	0.1	1.3	O K
5760 min Summer	67.145	17.645	0.1	1.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
15 min Summer	127.517	0.0	0		
30 min Summer	85.701	0.0	0		
60 min Summer	54.957	0.0	1188		
120 min Summer	34.010	0.0	1036		
180 min Summer	25.295	0.0	1058		
240 min Summer	20.351	0.0	1058		
360 min Summer	14.971	0.0	1112		
480 min Summer	12.028	0.0	1160		
600 min Summer	10.141	0.0	1206		
720 min Summer	8.817	0.0	1256		
960 min Summer	7.063	0.0	1390		
1440 min Summer	5.157	0.0	1732		
2160 min Summer	3.757	0.0	2380		
2880 min Summer	2.997	0.0	3040		
4320 min Summer	2.176	0.0	4424		
5760 min Summer	1.731	0.0	5776		
©1982-2020 Innovyze					

MJA Consulting		Page 2
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes	
Date 01/11/2022 File Cascade.CASX	Designed by S.Smith Checked by CP	

Innovyze

Source Control 2020.1

Cascade Summary of Results for Deep Borehole Soakaway 3.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
7200 min Summer	66.724	17.224	0.1	1.2	O K
8640 min Summer	66.243	16.743	0.1	1.2	O K
10080 min Summer	65.760	16.260	0.1	1.1	O K
15 min Winter	49.500	0.000	0.0	0.0	O K
30 min Winter	49.500	0.000	0.0	0.0	O K
60 min Winter	51.626	2.126	0.0	0.2	O K
120 min Winter	55.423	5.923	0.0	0.4	O K
180 min Winter	57.508	8.008	0.1	0.6	O K
240 min Winter	58.896	9.396	0.1	0.7	O K
360 min Winter	60.899	11.399	0.1	0.8	O K
480 min Winter	62.334	12.834	0.1	0.9	O K
600 min Winter	63.439	13.939	0.1	1.0	O K
720 min Winter	64.319	14.819	0.1	1.0	O K
960 min Winter	65.678	16.178	0.1	1.1	O K
1440 min Winter	67.445	17.945	0.1	1.3	O K
2160 min Winter	68.947	19.447	0.1	1.4	O K
2880 min Winter	69.778	20.278	0.1	1.4	O K
4320 min Winter	70.507	21.007	0.1	1.5	O K
5760 min Winter	70.624	21.124	0.1	1.5	O K
7200 min Winter	70.383	20.883	0.1	1.5	O K
8640 min Winter	70.045	20.545	0.1	1.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
7200 min Summer	1.449	0.0	6976
8640 min Summer	1.255	0.0	7464
10080 min Summer	1.111	0.0	8448
15 min Winter	127.517	0.0	0
30 min Winter	85.701	0.0	0
60 min Winter	54.957	0.0	1052
120 min Winter	34.010	0.0	1052
180 min Winter	25.295	0.0	1056
240 min Winter	20.351	0.0	1094
360 min Winter	14.971	0.0	1122
480 min Winter	12.028	0.0	1172
600 min Winter	10.141	0.0	1222
720 min Winter	8.817	0.0	1274
960 min Winter	7.063	0.0	1416
1440 min Winter	5.157	0.0	1770
2160 min Winter	3.757	0.0	2372
2880 min Winter	2.997	0.0	2976
4320 min Winter	2.176	0.0	4328
5760 min Winter	1.731	0.0	5672
7200 min Winter	1.449	0.0	6976
8640 min Winter	1.255	0.0	8224

MJA Consulting				Page 3	
Monarch House Barton Lane OX14 3NB		Phase 2 Manor Farm Bedhampton Pond + Boreholes			
Date 01/11/2022 File Cascade.CASX		Designed by S.Smith Checked by CP			
Innovyze		Source Control 2020.1			
<u>Cascade Summary of Results for Deep Borehole Soakaway 3.SRCX</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	69.553	20.053	0.1	1.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
10080 min Winter	1.111	0.0	9472		
©1982-2020 Innovyze					

MJA Consulting		Page 4
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes	
Date 01/11/2022 File Cascade.CASX	Designed by S.Smith Checked by CP	
Innovyze Source Control 2020.1		

Cascade Rainfall Details for Deep Borehole Soakaway 3.SRCX

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)	19.400	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From:	To: (ha)
0	4 0.000

©1982-2020 Innovyze

MJA Consulting		Page 5
Monarch House Barton Lane OX14 3NB	Phase 2 Manor Farm Bedhampton Pond + Boreholes	
Date 01/11/2022 File Cascade.CASX	Designed by S.Smith Checked by CP	

Innovyze Source Control 2020.1

Cascade Model Details for Deep Borehole Soakaway 3.SRCX

Storage is Online Cover Level (m) 100.000

Deep Bore Soakaway Structure

Chamber Invert Level (m) 99.500 Infiltration Coefficient Base (m/hr) 0.05328
Chamber Diameter/Length (m) 1.200 Safety Factor 2.0
Borehole Diameter (m) 0.300
Borehole Depth (m) 50.000

Depth (m)	Side Infil. Coef. (m/hr)	Depth (m)	Side Infil. Coef. (m/hr)
0.000	0.05328	50.000	0.05328