

The Civil Engineering Practice					Page 1																																																																																																																																																																																																																			
11 Tungsten Building George Street Fishersgate BN41 1RA			Manor Nursery Angmering West Sussex																																																																																																																																																																																																																					
Date 23/09/2020 File Soakaway 9.3 Factor Saf...			Designed by S Burgess Checked by SRD																																																																																																																																																																																																																					
Innovyze			Source Control 2020.1																																																																																																																																																																																																																					
Summary of Results for 100 year Return Period (+40%) Half Drain Time : 89 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>14.184</td><td>1.284</td><td>0.5</td><td>2.6</td><td>O K</td></tr><tr><td>30 min Summer</td><td>14.587</td><td>1.687</td><td>0.5</td><td>3.3</td><td>O K</td></tr><tr><td>60 min Summer</td><td>14.875</td><td>1.975</td><td>0.5</td><td>3.8</td><td>O K</td></tr><tr><td>120 min Summer</td><td>14.975</td><td>2.075</td><td>0.5</td><td>4.0</td><td>O K</td></tr><tr><td>180 min Summer</td><td>14.930</td><td>2.030</td><td>0.5</td><td>3.9</td><td>O K</td></tr><tr><td>240 min Summer</td><td>14.830</td><td>1.930</td><td>0.5</td><td>3.7</td><td>O K</td></tr><tr><td>360 min Summer</td><td>14.614</td><td>1.714</td><td>0.5</td><td>3.3</td><td>O K</td></tr><tr><td>480 min Summer</td><td>14.399</td><td>1.499</td><td>0.5</td><td>3.0</td><td>O K</td></tr><tr><td>600 min Summer</td><td>14.198</td><td>1.298</td><td>0.5</td><td>2.6</td><td>O K</td></tr><tr><td>720 min Summer</td><td>14.017</td><td>1.117</td><td>0.5</td><td>2.3</td><td>O K</td></tr><tr><td>960 min Summer</td><td>13.720</td><td>0.820</td><td>0.5</td><td>1.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>13.394</td><td>0.494</td><td>0.4</td><td>1.2</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>13.278</td><td>0.378</td><td>0.3</td><td>0.9</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>13.211</td><td>0.311</td><td>0.3</td><td>0.7</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>13.132</td><td>0.232</td><td>0.2</td><td>0.6</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>13.086</td><td>0.186</td><td>0.2</td><td>0.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>13.057</td><td>0.157</td><td>0.1</td><td>0.4</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>13.036</td><td>0.136</td><td>0.1</td><td>0.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>13.021</td><td>0.121</td><td>0.1</td><td>0.3</td><td>O K</td></tr><tr><td>15 min Winter</td><td>14.376</td><td>1.476</td><td>0.5</td><td>2.9</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>128.238</td><td>0.0</td><td>17</td></tr><tr><td>30 min Summer</td><td>86.178</td><td>0.0</td><td>32</td></tr><tr><td>60 min Summer</td><td>55.250</td><td>0.0</td><td>60</td></tr><tr><td>120 min Summer</td><td>34.177</td><td>0.0</td><td>92</td></tr><tr><td>180 min Summer</td><td>25.410</td><td>0.0</td><td>126</td></tr><tr><td>240 min Summer</td><td>20.436</td><td>0.0</td><td>160</td></tr><tr><td>360 min Summer</td><td>15.037</td><td>0.0</td><td>228</td></tr><tr><td>480 min Summer</td><td>12.081</td><td>0.0</td><td>292</td></tr><tr><td>600 min Summer</td><td>10.185</td><td>0.0</td><td>356</td></tr><tr><td>720 min Summer</td><td>8.854</td><td>0.0</td><td>418</td></tr><tr><td>960 min Summer</td><td>7.093</td><td>0.0</td><td>532</td></tr><tr><td>1440 min Summer</td><td>5.178</td><td>0.0</td><td>750</td></tr><tr><td>2160 min Summer</td><td>3.772</td><td>0.0</td><td>1108</td></tr><tr><td>2880 min Summer</td><td>3.009</td><td>0.0</td><td>1472</td></tr><tr><td>4320 min Summer</td><td>2.184</td><td>0.0</td><td>2204</td></tr><tr><td>5760 min Summer</td><td>1.738</td><td>0.0</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.455</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.260</td><td>0.0</td><td>4400</td></tr><tr><td>10080 min Summer</td><td>1.115</td><td>0.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>128.238</td><td>0.0</td><td>17</td></tr></tbody></table>							Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	14.184	1.284	0.5	2.6	O K	30 min Summer	14.587	1.687	0.5	3.3	O K	60 min Summer	14.875	1.975	0.5	3.8	O K	120 min Summer	14.975	2.075	0.5	4.0	O K	180 min Summer	14.930	2.030	0.5	3.9	O K	240 min Summer	14.830	1.930	0.5	3.7	O K	360 min Summer	14.614	1.714	0.5	3.3	O K	480 min Summer	14.399	1.499	0.5	3.0	O K	600 min Summer	14.198	1.298	0.5	2.6	O K	720 min Summer	14.017	1.117	0.5	2.3	O K	960 min Summer	13.720	0.820	0.5	1.8	O K	1440 min Summer	13.394	0.494	0.4	1.2	O K	2160 min Summer	13.278	0.378	0.3	0.9	O K	2880 min Summer	13.211	0.311	0.3	0.7	O K	4320 min Summer	13.132	0.232	0.2	0.6	O K	5760 min Summer	13.086	0.186	0.2	0.4	O K	7200 min Summer	13.057	0.157	0.1	0.4	O K	8640 min Summer	13.036	0.136	0.1	0.3	O K	10080 min Summer	13.021	0.121	0.1	0.3	O K	15 min Winter	14.376	1.476	0.5	2.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	128.238	0.0	17	30 min Summer	86.178	0.0	32	60 min Summer	55.250	0.0	60	120 min Summer	34.177	0.0	92	180 min Summer	25.410	0.0	126	240 min Summer	20.436	0.0	160	360 min Summer	15.037	0.0	228	480 min Summer	12.081	0.0	292	600 min Summer	10.185	0.0	356	720 min Summer	8.854	0.0	418	960 min Summer	7.093	0.0	532	1440 min Summer	5.178	0.0	750	2160 min Summer	3.772	0.0	1108	2880 min Summer	3.009	0.0	1472	4320 min Summer	2.184	0.0	2204	5760 min Summer	1.738	0.0	2936	7200 min Summer	1.455	0.0	3672	8640 min Summer	1.260	0.0	4400	10080 min Summer	1.115	0.0	5136	15 min Winter	128.238	0.0	17
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status																																																																																																																																																																																																																			
15 min Summer	14.184	1.284	0.5	2.6	O K																																																																																																																																																																																																																			
30 min Summer	14.587	1.687	0.5	3.3	O K																																																																																																																																																																																																																			
60 min Summer	14.875	1.975	0.5	3.8	O K																																																																																																																																																																																																																			
120 min Summer	14.975	2.075	0.5	4.0	O K																																																																																																																																																																																																																			
180 min Summer	14.930	2.030	0.5	3.9	O K																																																																																																																																																																																																																			
240 min Summer	14.830	1.930	0.5	3.7	O K																																																																																																																																																																																																																			
360 min Summer	14.614	1.714	0.5	3.3	O K																																																																																																																																																																																																																			
480 min Summer	14.399	1.499	0.5	3.0	O K																																																																																																																																																																																																																			
600 min Summer	14.198	1.298	0.5	2.6	O K																																																																																																																																																																																																																			
720 min Summer	14.017	1.117	0.5	2.3	O K																																																																																																																																																																																																																			
960 min Summer	13.720	0.820	0.5	1.8	O K																																																																																																																																																																																																																			
1440 min Summer	13.394	0.494	0.4	1.2	O K																																																																																																																																																																																																																			
2160 min Summer	13.278	0.378	0.3	0.9	O K																																																																																																																																																																																																																			
2880 min Summer	13.211	0.311	0.3	0.7	O K																																																																																																																																																																																																																			
4320 min Summer	13.132	0.232	0.2	0.6	O K																																																																																																																																																																																																																			
5760 min Summer	13.086	0.186	0.2	0.4	O K																																																																																																																																																																																																																			
7200 min Summer	13.057	0.157	0.1	0.4	O K																																																																																																																																																																																																																			
8640 min Summer	13.036	0.136	0.1	0.3	O K																																																																																																																																																																																																																			
10080 min Summer	13.021	0.121	0.1	0.3	O K																																																																																																																																																																																																																			
15 min Winter	14.376	1.476	0.5	2.9	O K																																																																																																																																																																																																																			
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																					
15 min Summer	128.238	0.0	17																																																																																																																																																																																																																					
30 min Summer	86.178	0.0	32																																																																																																																																																																																																																					
60 min Summer	55.250	0.0	60																																																																																																																																																																																																																					
120 min Summer	34.177	0.0	92																																																																																																																																																																																																																					
180 min Summer	25.410	0.0	126																																																																																																																																																																																																																					
240 min Summer	20.436	0.0	160																																																																																																																																																																																																																					
360 min Summer	15.037	0.0	228																																																																																																																																																																																																																					
480 min Summer	12.081	0.0	292																																																																																																																																																																																																																					
600 min Summer	10.185	0.0	356																																																																																																																																																																																																																					
720 min Summer	8.854	0.0	418																																																																																																																																																																																																																					
960 min Summer	7.093	0.0	532																																																																																																																																																																																																																					
1440 min Summer	5.178	0.0	750																																																																																																																																																																																																																					
2160 min Summer	3.772	0.0	1108																																																																																																																																																																																																																					
2880 min Summer	3.009	0.0	1472																																																																																																																																																																																																																					
4320 min Summer	2.184	0.0	2204																																																																																																																																																																																																																					
5760 min Summer	1.738	0.0	2936																																																																																																																																																																																																																					
7200 min Summer	1.455	0.0	3672																																																																																																																																																																																																																					
8640 min Summer	1.260	0.0	4400																																																																																																																																																																																																																					
10080 min Summer	1.115	0.0	5136																																																																																																																																																																																																																					
15 min Winter	128.238	0.0	17																																																																																																																																																																																																																					
©1982-2020 Innovyze																																																																																																																																																																																																																								

The Civil Engineering Practice					Page 2
11 Tungsten Building George Street Fishersgate BN41 1RA		Manor Nursery Angmering West Sussex			
Date 23/09/2020 File Soakaway 9.3 Factor Saf...		Designed by S Burgess Checked by SRD			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	14.843	1.943	0.5	3.7	O K
60 min Winter	15.199	2.299	0.5	4.4	Flood Risk
120 min Winter	15.300	2.400	0.5	4.5	Flood Risk
180 min Winter	15.223	2.323	0.5	4.4	Flood Risk
240 min Winter	15.069	2.169	0.5	4.1	O K
360 min Winter	14.728	1.828	0.5	3.5	O K
480 min Winter	14.391	1.491	0.5	2.9	O K
600 min Winter	14.083	1.183	0.5	2.4	O K
720 min Winter	13.817	0.917	0.5	1.9	O K
960 min Winter	13.446	0.546	0.5	1.3	O K
1440 min Winter	13.292	0.392	0.4	0.9	O K
2160 min Winter	13.190	0.290	0.3	0.7	O K
2880 min Winter	13.133	0.233	0.2	0.6	O K
4320 min Winter	13.070	0.170	0.2	0.4	O K
5760 min Winter	13.036	0.136	0.1	0.3	O K
7200 min Winter	13.014	0.114	0.1	0.3	O K
8640 min Winter	12.999	0.099	0.1	0.2	O K
10080 min Winter	12.987	0.087	0.1	0.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	86.178	0.0	31		
60 min Winter	55.250	0.0	60		
120 min Winter	34.177	0.0	98		
180 min Winter	25.410	0.0	136		
240 min Winter	20.436	0.0	174		
360 min Winter	15.037	0.0	246		
480 min Winter	12.081	0.0	314		
600 min Winter	10.185	0.0	376		
720 min Winter	8.854	0.0	434		
960 min Winter	7.093	0.0	530		
1440 min Winter	5.178	0.0	762		
2160 min Winter	3.772	0.0	1124		
2880 min Winter	3.009	0.0	1472		
4320 min Winter	2.184	0.0	2204		
5760 min Winter	1.738	0.0	2936		
7200 min Winter	1.455	0.0	3672		
8640 min Winter	1.260	0.0	4400		
10080 min Winter	1.115	0.0	5136		
©1982-2020 Innovyze					

The Civil Engineering Practice		Page 3																														
11 Tungsten Building George Street Fishersgate BN41 1RA	Manor Nursery Angmering West Sussex																															
Date 23/09/2020	Designed by S Burgess																															
File Soakaway 9.3 Factor Saf...	Checked by SRD																															
Innovyze		Source Control 2020.1																														
<u>Rainfall Details</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>19.500</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) 0.012 <table> <tr> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> </tr> <tr> <td>0</td> <td>4 0.012</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)	19.500	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 0.012
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)	19.500	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 0.012																															
©1982-2020 Innovyze																																

The Civil Engineering Practice		Page 4																				
11 Tungsten Building George Street Fishersgate BN41 1RA	Manor Nursery Angmering West Sussex																					
Date 23/09/2020 File Soakaway 9.3 Factor Saf...	Designed by S Burgess Checked by SRD																					
Innovyze Source Control 2020.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 15.400 <u>Lined Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00000</td> <td>Ring Diameter (m)</td> <td>1.50</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>1.67040</td> <td>Pit Multiplier</td> <td>1.3</td> </tr> <tr> <td>Safety Factor</td> <td>4.0</td> <td>Number Required</td> <td>1</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>2.500</td> </tr> <tr> <td>Invert Level (m)</td> <td>12.900</td> <td>Cap Infiltration Depth (m)</td> <td>0.500</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00000	Ring Diameter (m)	1.50	Infiltration Coefficient Side (m/hr)	1.67040	Pit Multiplier	1.3	Safety Factor	4.0	Number Required	1	Porosity	0.30	Cap Volume Depth (m)	2.500	Invert Level (m)	12.900	Cap Infiltration Depth (m)	0.500
Infiltration Coefficient Base (m/hr)	0.00000	Ring Diameter (m)	1.50																			
Infiltration Coefficient Side (m/hr)	1.67040	Pit Multiplier	1.3																			
Safety Factor	4.0	Number Required	1																			
Porosity	0.30	Cap Volume Depth (m)	2.500																			
Invert Level (m)	12.900	Cap Infiltration Depth (m)	0.500																			
©1982-2020 Innovyze																						