

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 8 Factor Safet...			Designed by S Burgess Checked by SRD																																																																																																																																																																																																																					
Innovyze			Source Control 2020.1																																																																																																																																																																																																																					
Summary of Results for 100 year Return Period (+40%) Half Drain Time : 103 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>14.841</td><td>1.341</td><td>0.4</td><td>2.6</td><td>O K</td></tr><tr><td>30 min Summer</td><td>15.248</td><td>1.748</td><td>0.4</td><td>3.3</td><td>O K</td></tr><tr><td>60 min Summer</td><td>15.548</td><td>2.048</td><td>0.4</td><td>3.8</td><td>O K</td></tr><tr><td>120 min Summer</td><td>15.641</td><td>2.141</td><td>0.4</td><td>4.0</td><td>O K</td></tr><tr><td>180 min Summer</td><td>15.592</td><td>2.092</td><td>0.4</td><td>3.9</td><td>O K</td></tr><tr><td>240 min Summer</td><td>15.495</td><td>1.995</td><td>0.4</td><td>3.7</td><td>O K</td></tr><tr><td>360 min Summer</td><td>15.287</td><td>1.787</td><td>0.4</td><td>3.4</td><td>O K</td></tr><tr><td>480 min Summer</td><td>15.079</td><td>1.579</td><td>0.4</td><td>3.0</td><td>O K</td></tr><tr><td>600 min Summer</td><td>14.881</td><td>1.381</td><td>0.4</td><td>2.7</td><td>O K</td></tr><tr><td>720 min Summer</td><td>14.696</td><td>1.196</td><td>0.4</td><td>2.3</td><td>O K</td></tr><tr><td>960 min Summer</td><td>14.381</td><td>0.881</td><td>0.4</td><td>1.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>13.967</td><td>0.467</td><td>0.4</td><td>1.0</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>13.801</td><td>0.301</td><td>0.4</td><td>0.7</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>13.745</td><td>0.245</td><td>0.3</td><td>0.6</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>13.681</td><td>0.181</td><td>0.2</td><td>0.4</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>13.645</td><td>0.145</td><td>0.2</td><td>0.3</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>13.622</td><td>0.122</td><td>0.1</td><td>0.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>13.606</td><td>0.106</td><td>0.1</td><td>0.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>13.593</td><td>0.093</td><td>0.1</td><td>0.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>15.033</td><td>1.533</td><td>0.4</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>18</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>96</td></tr><tr><td>180 min Summer</td><td>25.410</td><td>0.0</td><td>128</td></tr><tr><td>240 min Summer</td><td>20.436</td><td>0.0</td><td>164</td></tr><tr><td>360 min Summer</td><td>15.037</td><td>0.0</td><td>232</td></tr><tr><td>480 min Summer</td><td>12.081</td><td>0.0</td><td>298</td></tr><tr><td>600 min Summer</td><td>10.185</td><td>0.0</td><td>362</td></tr><tr><td>720 min Summer</td><td>8.854</td><td>0.0</td><td>426</td></tr><tr><td>960 min Summer</td><td>7.093</td><td>0.0</td><td>542</td></tr><tr><td>1440 min Summer</td><td>5.178</td><td>0.0</td><td>764</td></tr><tr><td>2160 min Summer</td><td>3.772</td><td>0.0</td><td>1104</td></tr><tr><td>2880 min Summer</td><td>3.009</td><td>0.0</td><td>1468</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	14.841	1.341	0.4	2.6	O K	30 min Summer	15.248	1.748	0.4	3.3	O K	60 min Summer	15.548	2.048	0.4	3.8	O K	120 min Summer	15.641	2.141	0.4	4.0	O K	180 min Summer	15.592	2.092	0.4	3.9	O K	240 min Summer	15.495	1.995	0.4	3.7	O K	360 min Summer	15.287	1.787	0.4	3.4	O K	480 min Summer	15.079	1.579	0.4	3.0	O K	600 min Summer	14.881	1.381	0.4	2.7	O K	720 min Summer	14.696	1.196	0.4	2.3	O K	960 min Summer	14.381	0.881	0.4	1.8	O K	1440 min Summer	13.967	0.467	0.4	1.0	O K	2160 min Summer	13.801	0.301	0.4	0.7	O K	2880 min Summer	13.745	0.245	0.3	0.6	O K	4320 min Summer	13.681	0.181	0.2	0.4	O K	5760 min Summer	13.645	0.145	0.2	0.3	O K	7200 min Summer	13.622	0.122	0.1	0.3	O K	8640 min Summer	13.606	0.106	0.1	0.3	O K	10080 min Summer	13.593	0.093	0.1	0.2	O K	15 min Winter	15.033	1.533	0.4	2.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	128.238	0.0	18	30 min Summer	86.178	0.0	32	60 min Summer	55.250	0.0	60	120 min Summer	34.177	0.0	96	180 min Summer	25.410	0.0	128	240 min Summer	20.436	0.0	164	360 min Summer	15.037	0.0	232	480 min Summer	12.081	0.0	298	600 min Summer	10.185	0.0	362	720 min Summer	8.854	0.0	426	960 min Summer	7.093	0.0	542	1440 min Summer	5.178	0.0	764	2160 min Summer	3.772	0.0	1104	2880 min Summer	3.009	0.0	1468	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	14.841	1.341	0.4	2.6	O K																																																																																																																																																																																																																			
30 min Summer	15.248	1.748	0.4	3.3	O K																																																																																																																																																																																																																			
60 min Summer	15.548	2.048	0.4	3.8	O K																																																																																																																																																																																																																			
120 min Summer	15.641	2.141	0.4	4.0	O K																																																																																																																																																																																																																			
180 min Summer	15.592	2.092	0.4	3.9	O K																																																																																																																																																																																																																			
240 min Summer	15.495	1.995	0.4	3.7	O K																																																																																																																																																																																																																			
360 min Summer	15.287	1.787	0.4	3.4	O K																																																																																																																																																																																																																			
480 min Summer	15.079	1.579	0.4	3.0	O K																																																																																																																																																																																																																			
600 min Summer	14.881	1.381	0.4	2.7	O K																																																																																																																																																																																																																			
720 min Summer	14.696	1.196	0.4	2.3	O K																																																																																																																																																																																																																			
960 min Summer	14.381	0.881	0.4	1.8	O K																																																																																																																																																																																																																			
1440 min Summer	13.967	0.467	0.4	1.0	O K																																																																																																																																																																																																																			
2160 min Summer	13.801	0.301	0.4	0.7	O K																																																																																																																																																																																																																			
2880 min Summer	13.745	0.245	0.3	0.6	O K																																																																																																																																																																																																																			
4320 min Summer	13.681	0.181	0.2	0.4	O K																																																																																																																																																																																																																			
5760 min Summer	13.645	0.145	0.2	0.3	O K																																																																																																																																																																																																																			
7200 min Summer	13.622	0.122	0.1	0.3	O K																																																																																																																																																																																																																			
8640 min Summer	13.606	0.106	0.1	0.3	O K																																																																																																																																																																																																																			
10080 min Summer	13.593	0.093	0.1	0.2	O K																																																																																																																																																																																																																			
15 min Winter	15.033	1.533	0.4	2.9	O K																																																																																																																																																																																																																			
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																					
15 min Summer	128.238	0.0	18																																																																																																																																																																																																																					
30 min Summer	86.178	0.0	32																																																																																																																																																																																																																					
60 min Summer	55.250	0.0	60																																																																																																																																																																																																																					
120 min Summer	34.177	0.0	96																																																																																																																																																																																																																					
180 min Summer	25.410	0.0	128																																																																																																																																																																																																																					
240 min Summer	20.436	0.0	164																																																																																																																																																																																																																					
360 min Summer	15.037	0.0	232																																																																																																																																																																																																																					
480 min Summer	12.081	0.0	298																																																																																																																																																																																																																					
600 min Summer	10.185	0.0	362																																																																																																																																																																																																																					
720 min Summer	8.854	0.0	426																																																																																																																																																																																																																					
960 min Summer	7.093	0.0	542																																																																																																																																																																																																																					
1440 min Summer	5.178	0.0	764																																																																																																																																																																																																																					
2160 min Summer	3.772	0.0	1104																																																																																																																																																																																																																					
2880 min Summer	3.009	0.0	1468																																																																																																																																																																																																																					
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 8 Factor Safet...		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	15.506	2.006	0.4	3.8	O K
60 min Winter	15.877	2.377	0.4	4.4	Flood Risk
120 min Winter	15.992	2.492	0.4	4.6	Flood Risk
180 min Winter	15.916	2.416	0.4	4.5	Flood Risk
240 min Winter	15.772	2.272	0.4	4.2	Flood Risk
360 min Winter	15.448	1.948	0.4	3.7	O K
480 min Winter	15.120	1.620	0.4	3.1	O K
600 min Winter	14.812	1.312	0.4	2.5	O K
720 min Winter	14.534	1.034	0.4	2.0	O K
960 min Winter	14.091	0.591	0.4	1.3	O K
1440 min Winter	13.806	0.306	0.4	0.7	O K
2160 min Winter	13.726	0.226	0.3	0.5	O K
2880 min Winter	13.681	0.181	0.2	0.4	O K
4320 min Winter	13.632	0.132	0.2	0.3	O K
5760 min Winter	13.605	0.105	0.1	0.2	O K
7200 min Winter	13.588	0.088	0.1	0.2	O K
8640 min Winter	13.576	0.076	0.1	0.2	O K
10080 min Winter	13.568	0.068	0.1	0.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	86.178	0.0	32		
60 min Winter	55.250	0.0	60		
120 min Winter	34.177	0.0	112		
180 min Winter	25.410	0.0	140		
240 min Winter	20.436	0.0	178		
360 min Winter	15.037	0.0	252		
480 min Winter	12.081	0.0	320		
600 min Winter	10.185	0.0	386		
720 min Winter	8.854	0.0	448		
960 min Winter	7.093	0.0	556		
1440 min Winter	5.178	0.0	750		
2160 min Winter	3.772	0.0	1108		
2880 min Winter	3.009	0.0	1472		
4320 min Winter	2.184	0.0	2204		
5760 min Winter	1.738	0.0	2928		
7200 min Winter	1.455	0.0	3672		
8640 min Winter	1.260	0.0	4408		
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 8 Factor Safet...	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> <td>Time (mins)</td> <td>Area</td> </tr> <tr> <td>From: To:</td> <td>(ha)</td> </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 8 Factor Safet...	Designed by S Burgess Checked by SRD																					
Innovyze Source Control 2020.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 16.000 <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>2.16000</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>13.500</td> <td>Cap Infiltration Depth (m)</td> <td>0.350</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00000	Ring Diameter (m)	1.50	Infiltration Coefficient Side (m/hr)	2.16000	Pit Multiplier	1.3	Safety Factor	4.0	Number Required	1	Porosity	0.30	Cap Volume Depth (m)	2.500	Invert Level (m)	13.500	Cap Infiltration Depth (m)	0.350
Infiltration Coefficient Base (m/hr)	0.00000	Ring Diameter (m)	1.50																			
Infiltration Coefficient Side (m/hr)	2.16000	Pit Multiplier	1.3																			
Safety Factor	4.0	Number Required	1																			
Porosity	0.30	Cap Volume Depth (m)	2.500																			
Invert Level (m)	13.500	Cap Infiltration Depth (m)	0.350																			
©1982-2020 Innovyze																						