

Priestley Johnson Ltd				Page 1																																																																																																																																																																																																																			
Bank House 105-109 New St, Blackrod Bolton BL6 5AG			LINCOLN WAY JAMES ALPE BUILDING 4																																																																																																																																																																																																																				
Date 01-Apr-19 File DRAINAGE SOAKAWAY 100 YEA...			Designed by SMJ Checked by																																																																																																																																																																																																																				
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Summary of Results for 100 year Return Period (+30%) Half Drain Time : 296 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>95.129</td><td>1.629</td><td>0.5</td><td>6.3</td><td>O K</td></tr><tr><td>30 min Summer</td><td>95.381</td><td>1.881</td><td>0.5</td><td>8.7</td><td>O K</td></tr><tr><td>60 min Summer</td><td>95.649</td><td>2.149</td><td>0.5</td><td>11.2</td><td>O K</td></tr><tr><td>120 min Summer</td><td>95.883</td><td>2.383</td><td>0.5</td><td>13.5</td><td>O K</td></tr><tr><td>180 min Summer</td><td>95.957</td><td>2.457</td><td>0.5</td><td>14.2</td><td>O K</td></tr><tr><td>240 min Summer</td><td>95.970</td><td>2.470</td><td>0.5</td><td>14.3</td><td>O K</td></tr><tr><td>360 min Summer</td><td>95.964</td><td>2.464</td><td>0.5</td><td>14.2</td><td>O K</td></tr><tr><td>480 min Summer</td><td>95.946</td><td>2.446</td><td>0.5</td><td>14.1</td><td>O K</td></tr><tr><td>600 min Summer</td><td>95.923</td><td>2.423</td><td>0.5</td><td>13.8</td><td>O K</td></tr><tr><td>720 min Summer</td><td>95.893</td><td>2.393</td><td>0.5</td><td>13.6</td><td>O K</td></tr><tr><td>960 min Summer</td><td>95.822</td><td>2.322</td><td>0.5</td><td>12.9</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>95.657</td><td>2.157</td><td>0.5</td><td>11.3</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>95.399</td><td>1.899</td><td>0.5</td><td>8.9</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>95.164</td><td>1.664</td><td>0.5</td><td>6.6</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>94.807</td><td>1.307</td><td>0.5</td><td>3.2</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>94.592</td><td>1.092</td><td>0.5</td><td>1.2</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>94.501</td><td>1.001</td><td>0.5</td><td>0.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>94.488</td><td>0.988</td><td>0.4</td><td>0.2</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>94.479</td><td>0.979</td><td>0.4</td><td>0.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>95.215</td><td>1.715</td><td>0.5</td><td>7.1</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>103.546</td><td>0.0</td><td>18</td></tr><tr><td>30 min Summer</td><td>73.269</td><td>0.0</td><td>33</td></tr><tr><td>60 min Summer</td><td>49.663</td><td>0.0</td><td>62</td></tr><tr><td>120 min Summer</td><td>32.373</td><td>0.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>24.673</td><td>0.0</td><td>180</td></tr><tr><td>240 min Summer</td><td>20.227</td><td>0.0</td><td>232</td></tr><tr><td>360 min Summer</td><td>15.279</td><td>0.0</td><td>292</td></tr><tr><td>480 min Summer</td><td>12.492</td><td>0.0</td><td>358</td></tr><tr><td>600 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Summer	95.381	1.881	0.5	8.7	O K	60 min Summer	95.649	2.149	0.5	11.2	O K	120 min Summer	95.883	2.383	0.5	13.5	O K	180 min Summer	95.957	2.457	0.5	14.2	O K	240 min Summer	95.970	2.470	0.5	14.3	O K	360 min Summer	95.964	2.464	0.5	14.2	O K	480 min Summer	95.946	2.446	0.5	14.1	O K	600 min Summer	95.923	2.423	0.5	13.8	O K	720 min Summer	95.893	2.393	0.5	13.6	O K	960 min Summer	95.822	2.322	0.5	12.9	O K	1440 min Summer	95.657	2.157	0.5	11.3	O K	2160 min Summer	95.399	1.899	0.5	8.9	O K	2880 min Summer	95.164	1.664	0.5	6.6	O K	4320 min Summer	94.807	1.307	0.5	3.2	O K	5760 min Summer	94.592	1.092	0.5	1.2	O K	7200 min Summer	94.501	1.001	0.5	0.3	O K	8640 min Summer	94.488	0.988	0.4	0.2	O K	10080 min Summer	94.479	0.979	0.4	0.2	O K	15 min Winter	95.215	1.715	0.5	7.1	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	103.546	0.0	18	30 min Summer	73.269	0.0	33	60 min Summer	49.663	0.0	62	120 min Summer	32.373	0.0	122	180 min Summer	24.673	0.0	180	240 min 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Bank House 105-109 New St, Blackrod Bolton BL6 5AG		LINCOLN WAY JAMES ALPE BUILDING 4			
Date 01-Apr-19 File DRAINAGE SOAKAWAY 100 YEA...		Designed by SMJ Checked by			
Micro Drainage		Source Control 2018.1.1			
Summary of Results for 100 year Return Period (+30%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	95.504	2.004	0.5	9.9	O K
60 min Winter	95.818	2.318	0.5	12.8	O K
120 min Winter	96.107	2.607	0.5	15.6	O K
180 min Winter	96.218	2.718	0.5	16.6	Flood Risk
240 min Winter	96.257	2.757	0.5	17.0	Flood Risk
360 min Winter	96.252	2.752	0.5	17.0	Flood Risk
480 min Winter	96.214	2.714	0.5	16.6	Flood Risk
600 min Winter	96.176	2.676	0.5	16.2	Flood Risk
720 min Winter	96.127	2.627	0.5	15.8	O K
960 min Winter	96.008	2.508	0.5	14.6	O K
1440 min Winter	95.733	2.233	0.5	12.0	O K
2160 min Winter	95.322	1.822	0.5	8.1	O K
2880 min Winter	94.967	1.467	0.5	4.8	O K
4320 min Winter	94.528	1.028	0.5	0.6	O K
5760 min Winter	94.485	0.985	0.4	0.2	O K
7200 min Winter	94.473	0.973	0.4	0.1	O K
8640 min Winter	94.464	0.964	0.3	0.1	O K
10080 min Winter	94.457	0.957	0.3	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	73.269	0.0	32		
60 min Winter	49.663	0.0	62		
120 min Winter	32.373	0.0	120		
180 min Winter	24.673	0.0	176		
240 min Winter	20.227	0.0	232		
360 min Winter	15.279	0.0	338		
480 min Winter	12.492	0.0	384		
600 min Winter	10.672	0.0	460		
720 min Winter	9.375	0.0	538		
960 min Winter	7.631	0.0	692		
1440 min Winter	5.692	0.0	982		
2160 min Winter	4.231	0.0	1384		
2880 min Winter	3.424	0.0	1732		
4320 min Winter	2.547	0.0	2292		
5760 min Winter	2.067	0.0	2936		
7200 min Winter	1.759	0.0	3624		
8640 min Winter	1.544	0.0	4400		
10080 min Winter	1.384	0.0	5128		
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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)	18.900	Shortest Storm (mins)	15
Ratio R	0.259	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.035

Time (mins)	Area
From: To:	(ha)
0	4 0.035

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Model Details

Storage is Online Cover Level (m) 96.450

Cellular Storage Structure

Invert Level (m) 93.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.36000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.36000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	0.0	0.0	1.300	10.0	10.0
0.100	0.0	0.0	1.400	10.0	10.0
0.200	0.0	0.0	1.500	10.0	10.0
0.300	0.0	0.0	1.600	10.0	10.0
0.400	0.0	0.0	1.700	10.0	10.0
0.500	0.0	0.0	1.800	10.0	10.0
0.600	0.0	0.0	1.900	10.0	10.0
0.700	0.0	0.0	2.000	10.0	10.0
0.800	0.0	0.0	2.100	10.0	10.0
0.900	0.0	0.0	2.200	10.0	10.0
1.000	10.0	10.0	2.300	10.0	10.0
1.100	10.0	10.0	2.400	10.0	10.0
1.200	10.0	10.0	2.500	10.0	10.0

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