

Priestley Johnson Ltd				Page 1																																																																																																																																																																																																																			
Bank House 105-109 New St, Blackrod Bolton BL6 5AG			LINCOLN WAY JAMES ALPE ROAD																																																																																																																																																																																																																				
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%) Half Drain Time : 77 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>81.578</td><td>1.128</td><td>2.7</td><td>14.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>81.945</td><td>1.495</td><td>3.1</td><td>19.1</td><td>O K</td></tr><tr><td>60 min Summer</td><td>82.240</td><td>1.790</td><td>3.4</td><td>22.8</td><td>O K</td></tr><tr><td>120 min Summer</td><td>82.417</td><td>1.967</td><td>3.6</td><td>25.1</td><td>O K</td></tr><tr><td>180 min Summer</td><td>82.423</td><td>1.973</td><td>3.6</td><td>25.2</td><td>O K</td></tr><tr><td>240 min Summer</td><td>82.380</td><td>1.930</td><td>3.5</td><td>24.6</td><td>O K</td></tr><tr><td>360 min Summer</td><td>82.280</td><td>1.830</td><td>3.4</td><td>23.3</td><td>O K</td></tr><tr><td>480 min Summer</td><td>82.170</td><td>1.720</td><td>3.3</td><td>21.9</td><td>O K</td></tr><tr><td>600 min Summer</td><td>82.060</td><td>1.610</td><td>3.2</td><td>20.5</td><td>O K</td></tr><tr><td>720 min Summer</td><td>81.954</td><td>1.504</td><td>3.1</td><td>19.2</td><td>O K</td></tr><tr><td>960 min Summer</td><td>81.761</td><td>1.311</td><td>2.9</td><td>16.7</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>81.447</td><td>0.997</td><td>2.5</td><td>12.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>81.109</td><td>0.659</td><td>2.2</td><td>8.4</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>80.875</td><td>0.425</td><td>1.9</td><td>5.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>80.592</td><td>0.142</td><td>1.6</td><td>1.8</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>80.497</td><td>0.047</td><td>1.4</td><td>0.6</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>80.490</td><td>0.040</td><td>1.2</td><td>0.5</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>80.486</td><td>0.036</td><td>1.1</td><td>0.5</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>80.482</td><td>0.032</td><td>1.0</td><td>0.4</td><td>O K</td></tr><tr><td>15 min Winter</td><td>81.728</td><td>1.278</td><td>2.8</td><td>16.3</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>102.945</td><td>0.0</td><td>17</td></tr><tr><td>30 min Summer</td><td>72.846</td><td>0.0</td><td>31</td></tr><tr><td>60 min Summer</td><td>49.388</td><td>0.0</td><td>54</td></tr><tr><td>120 min Summer</td><td>32.212</td><td>0.0</td><td>88</td></tr><tr><td>180 min Summer</td><td>24.564</td><td>0.0</td><td>122</td></tr><tr><td>240 min Summer</td><td>20.135</td><td>0.0</td><td>156</td></tr><tr><td>360 min Summer</td><td>15.211</td><td>0.0</td><td>226</td></tr><tr><td>480 min Summer</td><td>12.437</td><td>0.0</td><td>292</td></tr><tr><td>600 min Summer</td><td>10.625</td><td>0.0</td><td>360</td></tr><tr><td>720 min Summer</td><td>9.335</td><td>0.0</td><td>424</td></tr><tr><td>960 min Summer</td><td>7.599</td><td>0.0</td><td>550</td></tr><tr><td>1440 min Summer</td><td>5.669</td><td>0.0</td><td>796</td></tr><tr><td>2160 min Summer</td><td>4.214</td><td>0.0</td><td>1168</td></tr><tr><td>2880 min Summer</td><td>3.410</td><td>0.0</td><td>1528</td></tr><tr><td>4320 min Summer</td><td>2.537</td><td>0.0</td><td>2208</td></tr><tr><td>5760 min Summer</td><td>2.058</td><td>0.0</td><td>2856</td></tr><tr><td>7200 min Summer</td><td>1.752</td><td>0.0</td><td>3640</td></tr><tr><td>8640 min Summer</td><td>1.537</td><td>0.0</td><td>4392</td></tr><tr><td>10080 min Summer</td><td>1.377</td><td>0.0</td><td>5000</td></tr><tr><td>15 min Winter</td><td>102.945</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	81.578	1.128	2.7	14.4	O K	30 min Summer	81.945	1.495	3.1	19.1	O K	60 min Summer	82.240	1.790	3.4	22.8	O K	120 min Summer	82.417	1.967	3.6	25.1	O K	180 min Summer	82.423	1.973	3.6	25.2	O K	240 min Summer	82.380	1.930	3.5	24.6	O K	360 min Summer	82.280	1.830	3.4	23.3	O K	480 min Summer	82.170	1.720	3.3	21.9	O K	600 min Summer	82.060	1.610	3.2	20.5	O K	720 min Summer	81.954	1.504	3.1	19.2	O K	960 min Summer	81.761	1.311	2.9	16.7	O K	1440 min Summer	81.447	0.997	2.5	12.7	O K	2160 min Summer	81.109	0.659	2.2	8.4	O K	2880 min Summer	80.875	0.425	1.9	5.4	O K	4320 min Summer	80.592	0.142	1.6	1.8	O K	5760 min Summer	80.497	0.047	1.4	0.6	O K	7200 min Summer	80.490	0.040	1.2	0.5	O K	8640 min Summer	80.486	0.036	1.1	0.5	O K	10080 min Summer	80.482	0.032	1.0	0.4	O K	15 min Winter	81.728	1.278	2.8	16.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	102.945	0.0	17	30 min Summer	72.846	0.0	31	60 min Summer	49.388	0.0	54	120 min Summer	32.212	0.0	88	180 min Summer	24.564	0.0	122	240 min 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Bank House 105-109 New St, Blackrod Bolton BL6 5AG		LINCOLN WAY JAMES ALPE ROAD			
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	82.155	1.705	3.3	21.7	O K
60 min Winter	82.511	2.061	3.7	26.3	O K
120 min Winter	82.703	2.253	3.9	28.7	O K
180 min Winter	82.691	2.241	3.9	28.6	O K
240 min Winter	82.610	2.160	3.8	27.6	O K
360 min Winter	82.426	1.976	3.6	25.2	O K
480 min Winter	82.247	1.797	3.4	22.9	O K
600 min Winter	82.079	1.629	3.2	20.8	O K
720 min Winter	81.924	1.474	3.0	18.8	O K
960 min Winter	81.656	1.206	2.8	15.4	O K
1440 min Winter	81.250	0.800	2.3	10.2	O K
2160 min Winter	80.851	0.401	1.9	5.1	O K
2880 min Winter	80.601	0.151	1.6	1.9	O K
4320 min Winter	80.492	0.042	1.3	0.5	O K
5760 min Winter	80.484	0.034	1.0	0.4	O K
7200 min Winter	80.479	0.029	0.9	0.4	O K
8640 min Winter	80.476	0.026	0.8	0.3	O K
10080 min Winter	80.473	0.023	0.7	0.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	72.846	0.0	31		
60 min Winter	49.388	0.0	58		
120 min Winter	32.212	0.0	92		
180 min Winter	24.564	0.0	132		
240 min Winter	20.135	0.0	170		
360 min Winter	15.211	0.0	242		
480 min Winter	12.437	0.0	312		
600 min Winter	10.625	0.0	380		
720 min Winter	9.335	0.0	448		
960 min Winter	7.599	0.0	578		
1440 min Winter	5.669	0.0	834		
2160 min Winter	4.214	0.0	1192		
2880 min Winter	3.410	0.0	1532		
4320 min Winter	2.537	0.0	2200		
5760 min Winter	2.058	0.0	2856		
7200 min Winter	1.752	0.0	3640		
8640 min Winter	1.537	0.0	4248		
10080 min Winter	1.377	0.0	5072		
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Micro Drainage		Source Control 2018.1.1

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)	18.800	Shortest Storm (mins)	15
Ratio R	0.259	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.085

Time (mins)	Area
From: To:	(ha)
0	4 0.085

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<u>Model Details</u> Storage is Online Cover Level (m) 84.200 <u>Lined Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.36000</td> <td>Ring Diameter (m)</td> <td>2.70</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.36000</td> <td>Pit Multiplier</td> <td>2.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Number Required</td> <td>1</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>0.000</td> </tr> <tr> <td>Invert Level (m)</td> <td>80.450</td> <td>Cap Infiltration Depth (m)</td> <td>0.000</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.36000	Ring Diameter (m)	2.70	Infiltration Coefficient Side (m/hr)	0.36000	Pit Multiplier	2.0	Safety Factor	2.0	Number Required	1	Porosity	0.30	Cap Volume Depth (m)	0.000	Invert Level (m)	80.450	Cap Infiltration Depth (m)	0.000
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