

Priestley Johnson Ltd				Page 1																																																																																																																																																																																																																			
Bank House 105-109 New St, Blackrod Bolton BL6 5AG		LINCOLN WAY JAMES ALPE BUILDING 7																																																																																																																																																																																																																					
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 Half Drain Time : 304 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>94.190</td><td>0.690</td><td>1.0</td><td>13.1</td><td>O K</td></tr><tr><td>30 min Summer</td><td>94.453</td><td>0.953</td><td>1.0</td><td>18.1</td><td>O K</td></tr><tr><td>60 min Summer</td><td>94.735</td><td>1.235</td><td>1.0</td><td>23.5</td><td>O K</td></tr><tr><td>120 min Summer</td><td>94.986</td><td>1.486</td><td>1.0</td><td>28.2</td><td>O K</td></tr><tr><td>180 min Summer</td><td>95.072</td><td>1.572</td><td>1.0</td><td>29.9</td><td>O K</td></tr><tr><td>240 min Summer</td><td>95.092</td><td>1.592</td><td>1.0</td><td>30.2</td><td>O K</td></tr><tr><td>360 min Summer</td><td>95.089</td><td>1.589</td><td>1.0</td><td>30.2</td><td>O K</td></tr><tr><td>480 min 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Summer</td><td>93.546</td><td>0.046</td><td>0.9</td><td>0.9</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>93.541</td><td>0.041</td><td>0.8</td><td>0.8</td><td>O K</td></tr><tr><td>15 min Winter</td><td>94.279</td><td>0.779</td><td>1.0</td><td>14.8</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>79.651</td><td>0.0</td><td>18</td></tr><tr><td>30 min Summer</td><td>56.360</td><td>0.0</td><td>33</td></tr><tr><td>60 min Summer</td><td>38.202</td><td>0.0</td><td>62</td></tr><tr><td>120 min Summer</td><td>24.903</td><td>0.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>18.979</td><td>0.0</td><td>180</td></tr><tr><td>240 min Summer</td><td>15.559</td><td>0.0</td><td>238</td></tr><tr><td>360 min Summer</td><td>11.753</td><td>0.0</td><td>298</td></tr><tr><td>480 min Summer</td><td>9.609</td><td>0.0</td><td>362</td></tr><tr><td>600 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Summer	94.453	0.953	1.0	18.1	O K	60 min Summer	94.735	1.235	1.0	23.5	O K	120 min Summer	94.986	1.486	1.0	28.2	O K	180 min Summer	95.072	1.572	1.0	29.9	O K	240 min Summer	95.092	1.592	1.0	30.2	O K	360 min Summer	95.089	1.589	1.0	30.2	O K	480 min Summer	95.073	1.573	1.0	29.9	O K	600 min Summer	95.050	1.550	1.0	29.4	O K	720 min Summer	95.021	1.521	1.0	28.9	O K	960 min Summer	94.951	1.451	1.0	27.6	O K	1440 min Summer	94.787	1.287	1.0	24.5	O K	2160 min Summer	94.527	1.027	1.0	19.5	O K	2880 min Summer	94.286	0.786	1.0	14.9	O K	4320 min Summer	93.913	0.413	1.0	7.9	O K	5760 min Summer	93.678	0.178	1.0	3.4	O K	7200 min Summer	93.566	0.066	1.0	1.2	O K	8640 min Summer	93.546	0.046	0.9	0.9	O K	10080 min Summer	93.541	0.041	0.8	0.8	O K	15 min Winter	94.279	0.779	1.0	14.8	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	79.651	0.0	18	30 min Summer	56.360	0.0	33	60 min Summer	38.202	0.0	62	120 min Summer	24.903	0.0	122	180 min Summer	18.979	0.0	180	240 min 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Priestley Johnson Ltd				Page 2	
Bank House 105-109 New St, Blackrod Bolton BL6 5AG		LINCOLN WAY JAMES ALPE BUILDING 7			
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					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	94.580	1.080	1.0	20.5	O K
60 min Winter	94.909	1.409	1.0	26.8	O K
120 min Winter	95.217	1.717	1.0	32.6	O K
180 min Winter	95.339	1.839	1.0	34.9	O K
240 min Winter	95.387	1.887	1.0	35.9	O K
360 min Winter	95.394	1.894	1.0	36.0	O K
480 min Winter	95.354	1.854	1.0	35.2	O K
600 min Winter	95.319	1.819	1.0	34.6	O K
720 min Winter	95.272	1.772	1.0	33.7	O K
960 min Winter	95.156	1.656	1.0	31.5	O K
1440 min Winter	94.882	1.382	1.0	26.3	O K
2160 min Winter	94.465	0.965	1.0	18.3	O K
2880 min Winter	94.099	0.599	1.0	11.4	O K
4320 min Winter	93.614	0.114	1.0	2.2	O K
5760 min Winter	93.544	0.044	0.9	0.8	O K
7200 min Winter	93.538	0.038	0.8	0.7	O K
8640 min Winter	93.533	0.033	0.7	0.6	O K
10080 min Winter	93.530	0.030	0.6	0.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	56.360	0.0	32		
60 min Winter	38.202	0.0	62		
120 min Winter	24.903	0.0	120		
180 min Winter	18.979	0.0	176		
240 min Winter	15.559	0.0	232		
360 min Winter	11.753	0.0	340		
480 min Winter	9.609	0.0	388		
600 min Winter	8.209	0.0	464		
720 min Winter	7.212	0.0	542		
960 min Winter	5.870	0.0	694		
1440 min Winter	4.379	0.0	984		
2160 min Winter	3.254	0.0	1388		
2880 min Winter	2.634	0.0	1760		
4320 min Winter	1.959	0.0	2336		
5760 min Winter	1.590	0.0	2864		
7200 min Winter	1.353	0.0	3616		
8640 min Winter	1.187	0.0	4392		
10080 min Winter	1.064	0.0	4984		
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Bank House 105-109 New St, Blackrod Bolton BL6 5AG	LINCOLN WAY JAMES ALPE BUILDING 7	
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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)	18.900	Shortest Storm (mins)	15
Ratio R	0.259	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.094

Time (mins)	Area (ha)
From: 0	To: 4 0.094

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<u>Model Details</u> Storage is Online Cover Level (m) 96.450 <u>Cellular Storage Structure</u> 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 <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr><td>0.000</td><td>20.0</td><td>20.0</td><td>1.300</td><td>20.0</td><td>20.0</td></tr> <tr><td>0.100</td><td>20.0</td><td>20.0</td><td>1.400</td><td>20.0</td><td>20.0</td></tr> <tr><td>0.200</td><td>20.0</td><td>20.0</td><td>1.500</td><td>20.0</td><td>20.0</td></tr> <tr><td>0.300</td><td>20.0</td><td>20.0</td><td>1.600</td><td>20.0</td><td>20.0</td></tr> <tr><td>0.400</td><td>20.0</td><td>20.0</td><td>1.700</td><td>20.0</td><td>20.0</td></tr> <tr><td>0.500</td><td>20.0</td><td>20.0</td><td>1.800</td><td>20.0</td><td>20.0</td></tr> <tr><td>0.600</td><td>20.0</td><td>20.0</td><td>1.900</td><td>20.0</td><td>20.0</td></tr> <tr><td>0.700</td><td>20.0</td><td>20.0</td><td>2.000</td><td>20.0</td><td>20.0</td></tr> <tr><td>0.800</td><td>20.0</td><td>20.0</td><td>2.100</td><td>20.0</td><td>20.0</td></tr> <tr><td>0.900</td><td>20.0</td><td>20.0</td><td>2.200</td><td>20.0</td><td>20.0</td></tr> <tr><td>1.000</td><td>20.0</td><td>20.0</td><td>2.300</td><td>20.0</td><td>20.0</td></tr> <tr><td>1.100</td><td>20.0</td><td>20.0</td><td>2.400</td><td>20.0</td><td>20.0</td></tr> <tr><td>1.200</td><td>20.0</td><td>20.0</td><td>2.500</td><td>20.0</td><td>20.0</td></tr> </tbody> </table>			Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	20.0	20.0	1.300	20.0	20.0	0.100	20.0	20.0	1.400	20.0	20.0	0.200	20.0	20.0	1.500	20.0	20.0	0.300	20.0	20.0	1.600	20.0	20.0	0.400	20.0	20.0	1.700	20.0	20.0	0.500	20.0	20.0	1.800	20.0	20.0	0.600	20.0	20.0	1.900	20.0	20.0	0.700	20.0	20.0	2.000	20.0	20.0	0.800	20.0	20.0	2.100	20.0	20.0	0.900	20.0	20.0	2.200	20.0	20.0	1.000	20.0	20.0	2.300	20.0	20.0	1.100	20.0	20.0	2.400	20.0	20.0	1.200	20.0	20.0	2.500	20.0	20.0
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