

Eastwood & Partners Ltd							Page 1																																																																																																																																																																																																																																																																																	
St Andrew's House 23 Kingfield Road Sheffield S11 9AS																																																																																																																																																																																																																																																																																								
Date 20/01/2023 16:20 File			Designed by TBland Checked by																																																																																																																																																																																																																																																																																					
Micro Drainage			Source Control 2019.1																																																																																																																																																																																																																																																																																					
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 665 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Control (l/s)</th><th>Max Σ Outflow (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>-1.415</td><td>0.385</td><td>0.0</td><td>3.5</td><td>3.5</td><td>93.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>-1.268</td><td>0.532</td><td>0.0</td><td>3.5</td><td>3.5</td><td>128.8</td><td>O K</td></tr><tr><td>60 min Summer</td><td>-1.103</td><td>0.697</td><td>0.0</td><td>3.5</td><td>3.5</td><td>169.0</td><td>O K</td></tr><tr><td>120 min Summer</td><td>-0.927</td><td>0.873</td><td>0.0</td><td>3.5</td><td>3.5</td><td>211.5</td><td>O K</td></tr><tr><td>180 min Summer</td><td>-0.834</td><td>0.966</td><td>0.0</td><td>3.5</td><td>3.5</td><td>233.9</td><td>O K</td></tr><tr><td>240 min Summer</td><td>-0.781</td><td>1.019</td><td>0.0</td><td>3.5</td><td>3.5</td><td>246.8</td><td>O K</td></tr><tr><td>360 min Summer</td><td>-0.720</td><td>1.080</td><td>0.0</td><td>3.5</td><td>3.5</td><td>261.6</td><td>O K</td></tr><tr><td>480 min Summer</td><td>-0.692</td><td>1.108</td><td>0.0</td><td>3.5</td><td>3.5</td><td>268.4</td><td>O K</td></tr><tr><td>600 min Summer</td><td>-0.684</td><td>1.116</td><td>0.0</td><td>3.5</td><td>3.5</td><td>270.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>-0.684</td><td>1.116</td><td>0.0</td><td>3.5</td><td>3.5</td><td>270.4</td><td>O K</td></tr><tr><td>960 min Summer</td><td>-0.691</td><td>1.109</td><td>0.0</td><td>3.5</td><td>3.5</td><td>268.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>-0.722</td><td>1.078</td><td>0.0</td><td>3.5</td><td>3.5</td><td>261.2</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>-0.783</td><td>1.017</td><td>0.0</td><td>3.5</td><td>3.5</td><td>246.4</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>-0.850</td><td>0.950</td><td>0.0</td><td>3.5</td><td>3.5</td><td>230.2</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>-0.990</td><td>0.810</td><td>0.0</td><td>3.5</td><td>3.5</td><td>196.2</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>-1.156</td><td>0.644</td><td>0.0</td><td>3.5</td><td>3.5</td><td>155.9</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>-1.289</td><td>0.511</td><td>0.0</td><td>3.5</td><td>3.5</td><td>123.8</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>-1.391</td><td>0.409</td><td>0.0</td><td>3.5</td><td>3.5</td><td>99.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>-1.470</td><td>0.330</td><td>0.0</td><td>3.5</td><td>3.5</td><td>79.9</td><td>O K</td></tr><tr><td>15 min Winter</td><td>-1.415</td><td>0.385</td><td>0.0</td><td>3.5</td><td>3.5</td><td>93.3</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak 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Summer</td><td>5.553</td><td>0.0</td><td>462.5</td><td>1026</td></tr><tr><td>2160 min Summer</td><td>4.108</td><td>0.0</td><td>518.4</td><td>1448</td></tr><tr><td>2880 min Summer</td><td>3.310</td><td>0.0</td><td>556.9</td><td>1872</td></tr><tr><td>4320 min Summer</td><td>2.438</td><td>0.0</td><td>614.8</td><td>2720</td></tr><tr><td>5760 min Summer</td><td>1.965</td><td>0.0</td><td>661.8</td><td>3456</td></tr><tr><td>7200 min Summer</td><td>1.663</td><td>0.0</td><td>700.0</td><td>4112</td></tr><tr><td>8640 min Summer</td><td>1.451</td><td>0.0</td><td>732.9</td><td>4840</td></tr><tr><td>10080 min Summer</td><td>1.294</td><td>0.0</td><td>761.8</td><td>5456</td></tr><tr><td>15 min Winter</td><td>109.295</td><td>0.0</td><td>94.2</td><td>18</td></tr></table>								Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status	15 min Summer	-1.415	0.385	0.0	3.5	3.5	93.4	O K	30 min Summer	-1.268	0.532	0.0	3.5	3.5	128.8	O K	60 min Summer	-1.103	0.697	0.0	3.5	3.5	169.0	O K	120 min Summer	-0.927	0.873	0.0	3.5	3.5	211.5	O K	180 min Summer	-0.834	0.966	0.0	3.5	3.5	233.9	O K	240 min Summer	-0.781	1.019	0.0	3.5	3.5	246.8	O K	360 min Summer	-0.720	1.080	0.0	3.5	3.5	261.6	O K	480 min Summer	-0.692	1.108	0.0	3.5	3.5	268.4	O K	600 min Summer	-0.684	1.116	0.0	3.5	3.5	270.4	O K	720 min Summer	-0.684	1.116	0.0	3.5	3.5	270.4	O K	960 min Summer	-0.691	1.109	0.0	3.5	3.5	268.8	O K	1440 min Summer	-0.722	1.078	0.0	3.5	3.5	261.2	O K	2160 min Summer	-0.783	1.017	0.0	3.5	3.5	246.4	O K	2880 min Summer	-0.850	0.950	0.0	3.5	3.5	230.2	O K	4320 min Summer	-0.990	0.810	0.0	3.5	3.5	196.2	O K	5760 min Summer	-1.156	0.644	0.0	3.5	3.5	155.9	O K	7200 min Summer	-1.289	0.511	0.0	3.5	3.5	123.8	O K	8640 min Summer	-1.391	0.409	0.0	3.5	3.5	99.0	O K	10080 min Summer	-1.470	0.330	0.0	3.5	3.5	79.9	O K	15 min Winter	-1.415	0.385	0.0	3.5	3.5	93.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	109.295	0.0	94.2	19	30 min Summer	76.125	0.0	131.5	33	60 min Summer	50.812	0.0	177.5	64	120 min Summer	32.748	0.0	228.9	122	180 min Summer	24.897	0.0	261.0	182	240 min Summer	20.306	0.0	283.9	242	360 min Summer	15.215	0.0	319.0	362	480 min Summer	12.380	0.0	346.0	480	600 min Summer	10.539	0.0	368.1	594	720 min Summer	9.234	0.0	386.9	642	960 min Summer	7.485	0.0	417.7	762	1440 min Summer	5.553	0.0	462.5	1026	2160 min Summer	4.108	0.0	518.4	1448	2880 min Summer	3.310	0.0	556.9	1872	4320 min Summer	2.438	0.0	614.8	2720	5760 min Summer	1.965	0.0	661.8	3456	7200 min Summer	1.663	0.0	700.0	4112	8640 min Summer	1.451	0.0	732.9	4840	10080 min Summer	1.294	0.0	761.8	5456	15 min Winter	109.295	0.0	94.2	18
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Eastwood & Partners Ltd		Page 3
St Andrew's House 23 Kingfield Road Sheffield S11 9AS		
Date 20/01/2023 16:20 File	Designed by TBland Checked by	
Micro Drainage Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 0.000

Cellular Storage Structure

Invert Level (m) -1.800 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	255.0	0.0	1.201	0.0	0.0
1.200	255.0	0.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0086-3500-1200-3500
Design Head (m) 1.200
Design Flow (l/s) 3.5
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 86
Invert Level (m) -1.800
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	3.5
Flush-Flo™	0.367	3.5
Kick-Flo®	0.746	2.8
Mean Flow over Head Range	-	3.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	3.5	3.000	5.4	7.000	8.0
0.200	3.3	1.400	3.8	3.500	5.8	7.500	8.3
0.300	3.5	1.600	4.0	4.000	6.1	8.000	8.5
0.400	3.5	1.800	4.2	4.500	6.5	8.500	8.8
0.500	3.4	2.000	4.4	5.000	6.8	9.000	9.0
0.600	3.3	2.200	4.6	5.500	7.1	9.500	9.2
0.800	2.9	2.400	4.8	6.000	7.4		
1.000	3.2	2.600	5.0	6.500	7.7		

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