

Infrastructure Design Limited							Page 1																																																																																																																																																																																																																																																																																														
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 119 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>0.340</td><td>0.340</td><td>0.0</td><td>5.0</td><td>5.0</td><td>39.3</td><td>0 K</td></tr><tr><td>30 min Summer</td><td>0.431</td><td>0.431</td><td>0.0</td><td>5.0</td><td>5.0</td><td>49.8</td><td>0 K</td></tr><tr><td>60 min Summer</td><td>0.504</td><td>0.504</td><td>0.0</td><td>5.0</td><td>5.0</td><td>58.2</td><td>0 K</td></tr><tr><td>120 min Summer</td><td>0.528</td><td>0.528</td><td>0.0</td><td>5.0</td><td>5.0</td><td>61.0</td><td>0 K</td></tr><tr><td>180 min Summer</td><td>0.521</td><td>0.521</td><td>0.0</td><td>5.0</td><td>5.0</td><td>60.2</td><td>0 K</td></tr><tr><td>240 min Summer</td><td>0.505</td><td>0.505</td><td>0.0</td><td>5.0</td><td>5.0</td><td>58.3</td><td>0 K</td></tr><tr><td>360 min Summer</td><td>0.461</td><td>0.461</td><td>0.0</td><td>5.0</td><td>5.0</td><td>53.3</td><td>0 K</td></tr><tr><td>480 min Summer</td><td>0.413</td><td>0.413</td><td>0.0</td><td>5.0</td><td>5.0</td><td>47.7</td><td>0 K</td></tr><tr><td>600 min Summer</td><td>0.369</td><td>0.369</td><td>0.0</td><td>5.0</td><td>5.0</td><td>42.6</td><td>0 K</td></tr><tr><td>720 min Summer</td><td>0.329</td><td>0.329</td><td>0.0</td><td>5.0</td><td>5.0</td><td>38.0</td><td>0 K</td></tr><tr><td>960 min Summer</td><td>0.260</td><td>0.260</td><td>0.0</td><td>5.0</td><td>5.0</td><td>30.0</td><td>0 K</td></tr><tr><td>1440 min Summer</td><td>0.168</td><td>0.168</td><td>0.0</td><td>4.9</td><td>4.9</td><td>19.4</td><td>0 K</td></tr><tr><td>2160 min Summer</td><td>0.115</td><td>0.115</td><td>0.0</td><td>4.4</td><td>4.4</td><td>13.3</td><td>0 K</td></tr><tr><td>2880 min Summer</td><td>0.096</td><td>0.096</td><td>0.0</td><td>3.6</td><td>3.6</td><td>11.1</td><td>0 K</td></tr><tr><td>4320 min Summer</td><td>0.077</td><td>0.077</td><td>0.0</td><td>2.7</td><td>2.7</td><td>8.9</td><td>0 K</td></tr><tr><td>5760 min Summer</td><td>0.067</td><td>0.067</td><td>0.0</td><td>2.1</td><td>2.1</td><td>7.7</td><td>0 K</td></tr><tr><td>7200 min Summer</td><td>0.060</td><td>0.060</td><td>0.0</td><td>1.8</td><td>1.8</td><td>6.9</td><td>0 K</td></tr><tr><td>8640 min Summer</td><td>0.055</td><td>0.055</td><td>0.0</td><td>1.5</td><td>1.5</td><td>6.4</td><td>0 K</td></tr><tr><td>10080 min Summer</td><td>0.051</td><td>0.051</td><td>0.0</td><td>1.4</td><td>1.4</td><td>5.9</td><td>0 K</td></tr><tr><td>15 min Winter</td><td>0.383</td><td>0.383</td><td>0.0</td><td>5.0</td><td>5.0</td><td>44.3</td><td>0 K</td></tr><tr><td>30 min Winter</td><td>0.489</td><td>0.489</td><td>0.0</td><td>5.0</td><td>5.0</td><td>56.5</td><td>0 K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain 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Summer</td><td>6.389</td><td>0.0</td><td>134.0</td><td>552</td></tr><tr><td>1440 min Summer</td><td>4.620</td><td>0.0</td><td>145.3</td><td>778</td></tr><tr><td>2160 min Summer</td><td>3.335</td><td>0.0</td><td>157.5</td><td>1108</td></tr><tr><td>2880 min Summer</td><td>2.644</td><td>0.0</td><td>166.5</td><td>1472</td></tr><tr><td>4320 min Summer</td><td>1.904</td><td>0.0</td><td>179.7</td><td>2204</td></tr><tr><td>5760 min Summer</td><td>1.506</td><td>0.0</td><td>189.8</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.256</td><td>0.0</td><td>197.7</td><td>3640</td></tr><tr><td>8640 min Summer</td><td>1.082</td><td>0.0</td><td>204.3</td><td>4344</td></tr><tr><td>10080 min Summer</td><td>0.953</td><td>0.0</td><td>210.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>129.843</td><td>0.0</td><td>47.4</td><td>18</td></tr><tr><td>30 min Winter</td><td>85.337</td><td>0.0</td><td>62.4</td><td>32</td></tr></table>								Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration 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Winter	0.383	0.383	0.0	5.0	5.0	44.3	0 K	30 min Winter	0.489	0.489	0.0	5.0	5.0	56.5	0 K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	129.843	0.0	42.3	18	30 min Summer	85.337	0.0	55.7	32	60 min Summer	53.483	0.0	70.1	62	120 min Summer	32.428	0.0	85.0	108	180 min Summer	23.896	0.0	93.9	140	240 min Summer	19.136	0.0	100.3	172	360 min Summer	13.890	0.0	109.2	242	480 min Summer	11.074	0.0	116.1	306	600 min Summer	9.283	0.0	121.7	370	720 min Summer	8.033	0.0	126.4	434	960 min Summer	6.389	0.0	134.0	552	1440 min Summer	4.620	0.0	145.3	778	2160 min Summer	3.335	0.0	157.5	1108	2880 min Summer	2.644	0.0	166.5	1472	4320 min Summer	1.904	0.0	179.7	2204	5760 min Summer	1.506	0.0	189.8	2936	7200 min Summer	1.256	0.0	197.7	3640	8640 min Summer	1.082	0.0	204.3	4344	10080 min Summer	0.953	0.0	210.0	5136	15 min Winter	129.843	0.0	47.4	18	30 min Winter	85.337	0.0	62.4	32
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Micro Drainage Source Control 2014.1.1

Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 0.000 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	121.6	121.6	1.300	0.0	150.3
0.100	121.6	126.0	1.400	0.0	150.3
0.200	121.6	130.4	1.500	0.0	150.3
0.300	121.6	134.8	1.600	0.0	150.3
0.400	121.6	139.2	1.700	0.0	150.3
0.500	121.6	143.7	1.800	0.0	150.3
0.600	121.6	148.1	1.900	0.0	150.3
0.700	0.0	150.3	2.000	0.0	150.3
0.800	0.0	150.3	2.100	0.0	150.3
0.900	0.0	150.3	2.200	0.0	150.3
1.000	0.0	150.3	2.300	0.0	150.3
1.100	0.0	150.3	2.400	0.0	150.3
1.200	0.0	150.3	2.500	0.0	150.3

Hydro-Brake Optimum® Outflow Control

Unit Reference MD-SHE-0110-5000-0660-5000
Design Head (m) 0.660
Design Flow (l/s) 5.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 110
Invert Level (m) 0.000
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.660	5.0	Kick-Flo®	0.459	4.2
Flush-Flo™	0.205	5.0	Mean Flow over Head Range	-	4.2

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	3.8	1.000	6.0	2.400	9.1	5.500	13.5
0.200	5.0	1.200	6.6	2.600	9.5	6.000	14.1
0.300	4.9	1.400	7.1	3.000	10.1	6.500	14.6
0.400	4.6	1.600	7.5	3.500	10.9	7.000	15.1
0.500	4.4	1.800	8.0	4.000	11.6	7.500	15.7
0.600	4.8	2.000	8.4	4.500	12.3	8.000	16.2
0.800	5.4	2.200	8.7	5.000	12.9	8.500	16.7

Infrastructure Design Limited		Page 5																
33 The Point Rockingham Road Market Harborough Leicestershire LE16 7QU	Crave Road, Reading Cellular Storage 1 in 100 yr + 40%																	
Date Oct 2011 File Cellular Storage.srcx	Designed by IDL Checked by PT																	
Micro Drainage																		
Source Control 2014.1.1																		
Hydro-Brake Optimum® Outflow Control <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>9.000</td><td>17.2</td><td>9.500</td><td>17.6</td><td></td><td></td><td></td><td></td></tr></tbody></table>			Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	9.000	17.2	9.500	17.6				
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