

Shaun Tonge Engineering							Page 1																																																																																																																																																																																																																																																																																		
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 19 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>52.203</td><td>0.603</td><td>0.0</td><td>4.4</td><td>4.4</td><td>6.9</td><td>O K</td></tr><tr><td>30 min Summer</td><td>52.277</td><td>0.677</td><td>0.0</td><td>4.4</td><td>4.4</td><td>7.7</td><td>O K</td></tr><tr><td>60 min Summer</td><td>52.267</td><td>0.667</td><td>0.0</td><td>4.4</td><td>4.4</td><td>7.6</td><td>O K</td></tr><tr><td>120 min Summer</td><td>52.149</td><td>0.549</td><td>0.0</td><td>4.4</td><td>4.4</td><td>6.3</td><td>O K</td></tr><tr><td>180 min Summer</td><td>51.989</td><td>0.389</td><td>0.0</td><td>4.4</td><td>4.4</td><td>4.4</td><td>O K</td></tr><tr><td>240 min Summer</td><td>51.873</td><td>0.273</td><td>0.0</td><td>4.4</td><td>4.4</td><td>3.1</td><td>O K</td></tr><tr><td>360 min Summer</td><td>51.748</td><td>0.148</td><td>0.0</td><td>4.2</td><td>4.2</td><td>1.7</td><td>O K</td></tr><tr><td>480 min Summer</td><td>51.710</td><td>0.110</td><td>0.0</td><td>3.8</td><td>3.8</td><td>1.3</td><td>O K</td></tr><tr><td>600 min Summer</td><td>51.695</td><td>0.095</td><td>0.0</td><td>3.2</td><td>3.2</td><td>1.1</td><td>O K</td></tr><tr><td>720 min Summer</td><td>51.685</td><td>0.085</td><td>0.0</td><td>2.8</td><td>2.8</td><td>1.0</td><td>O K</td></tr><tr><td>960 min Summer</td><td>51.673</td><td>0.073</td><td>0.0</td><td>2.3</td><td>2.3</td><td>0.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>51.660</td><td>0.060</td><td>0.0</td><td>1.7</td><td>1.7</td><td>0.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>51.650</td><td>0.050</td><td>0.0</td><td>1.2</td><td>1.2</td><td>0.6</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>51.644</td><td>0.044</td><td>0.0</td><td>1.0</td><td>1.0</td><td>0.5</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>51.637</td><td>0.037</td><td>0.0</td><td>0.7</td><td>0.7</td><td>0.4</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>51.632</td><td>0.032</td><td>0.0</td><td>0.6</td><td>0.6</td><td>0.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>51.629</td><td>0.029</td><td>0.0</td><td>0.5</td><td>0.5</td><td>0.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>51.627</td><td>0.027</td><td>0.0</td><td>0.4</td><td>0.4</td><td>0.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>51.626</td><td>0.026</td><td>0.0</td><td>0.4</td><td>0.4</td><td>0.3</td><td>O K</td></tr><tr><td>15 min Winter</td><td>52.293</td><td>0.693</td><td>0.0</td><td>4.4</td><td>4.4</td><td>7.9</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 (mins)</th></tr><tr><td>15 min 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Summer</td><td>3.584</td><td>0.0</td><td>39.7</td><td>1080</td></tr><tr><td>2880 min Summer</td><td>2.854</td><td>0.0</td><td>42.1</td><td>1428</td></tr><tr><td>4320 min Summer</td><td>2.067</td><td>0.0</td><td>45.8</td><td>2184</td></tr><tr><td>5760 min Summer</td><td>1.642</td><td>0.0</td><td>48.5</td><td>2904</td></tr><tr><td>7200 min Summer</td><td>1.373</td><td>0.0</td><td>50.7</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.186</td><td>0.0</td><td>52.5</td><td>4368</td></tr><tr><td>10080 min Summer</td><td>1.048</td><td>0.0</td><td>54.1</td><td>4968</td></tr><tr><td>15 min Winter</td><td>126.478</td><td>0.0</td><td>10.9</td><td>16</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	52.203	0.603	0.0	4.4	4.4	6.9	O K	30 min Summer	52.277	0.677	0.0	4.4	4.4	7.7	O K	60 min Summer	52.267	0.667	0.0	4.4	4.4	7.6	O K	120 min Summer	52.149	0.549	0.0	4.4	4.4	6.3	O K	180 min Summer	51.989	0.389	0.0	4.4	4.4	4.4	O K	240 min Summer	51.873	0.273	0.0	4.4	4.4	3.1	O K	360 min Summer	51.748	0.148	0.0	4.2	4.2	1.7	O K	480 min Summer	51.710	0.110	0.0	3.8	3.8	1.3	O K	600 min Summer	51.695	0.095	0.0	3.2	3.2	1.1	O K	720 min Summer	51.685	0.085	0.0	2.8	2.8	1.0	O K	960 min Summer	51.673	0.073	0.0	2.3	2.3	0.8	O K	1440 min Summer	51.660	0.060	0.0	1.7	1.7	0.7	O K	2160 min Summer	51.650	0.050	0.0	1.2	1.2	0.6	O K	2880 min Summer	51.644	0.044	0.0	1.0	1.0	0.5	O K	4320 min Summer	51.637	0.037	0.0	0.7	0.7	0.4	O K	5760 min Summer	51.632	0.032	0.0	0.6	0.6	0.4	O K	7200 min Summer	51.629	0.029	0.0	0.5	0.5	0.3	O K	8640 min Summer	51.627	0.027	0.0	0.4	0.4	0.3	O K	10080 min Summer	51.626	0.026	0.0	0.4	0.4	0.3	O K	15 min Winter	52.293	0.693	0.0	4.4	4.4	7.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	126.478	0.0	9.7	15	30 min Summer	84.424	0.0	13.0	24	60 min Summer	53.779	0.0	16.5	42	120 min Summer	33.103	0.0	20.4	76	180 min 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CADS		Source Control 2020.1.3

Model Details

Storage is Online Cover Level (m) 53.000

Cellular Storage Structure

Invert Level (m) 51.600 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	12.0	12.0	0.900	0.0	24.8
0.800	12.0	24.8			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0102-4400-0800-4400
Design Head (m) 0.800
Design Flow (l/s) 4.4
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 102
Invert Level (m) 51.600
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	4.4
Flush-Flo™	0.239	4.4
Kick-Flo®	0.529	3.6
Mean Flow over Head Range	-	3.8

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	3.4	1.200	5.3	3.000	8.2	7.000	12.2
0.200	4.4	1.400	5.7	3.500	8.8	7.500	12.6
0.300	4.3	1.600	6.1	4.000	9.3	8.000	13.0
0.400	4.2	1.800	6.4	4.500	9.9	8.500	13.4
0.500	3.9	2.000	6.7	5.000	10.4	9.000	13.7
0.600	3.9	2.200	7.0	5.500	10.9	9.500	14.1
0.800	4.4	2.400	7.3	6.000	11.3		
1.000	4.9	2.600	7.6	6.500	11.8		

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