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Ground Floor, 24 High Street Whittlesford Cambs, CB22 4LT	The Old Church, Albert Hill Street, Didsbury Attenuation Requirements	
Date 21/06/2021 14:45 File	Designed by SEC Checked by	

Innovyze

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 16 minutes.

	Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min	Summer	34.973	0.623	0.0	5.0	5.0	6.8	OK
30 min	Summer	35.042	0.692	0.0	5.0	5.0	7.6	OK
60 min	Summer	35.023	0.673	0.0	5.0	5.0	7.3	OK
120 min	Summer	34.882	0.532	0.0	5.0	5.0	5.8	OK
180 min	Summer	34.712	0.362	0.0	5.0	5.0	4.0	OK
240 min	Summer	34.595	0.245	0.0	5.0	5.0	2.7	OK
360 min	Summer	34.484	0.134	0.0	4.7	4.7	1.5	OK
480 min	Summer	34.457	0.107	0.0	4.0	4.0	1.2	OK
600 min	Summer	34.443	0.093	0.0	3.4	3.4	1.0	OK
720 min	Summer	34.434	0.084	0.0	3.0	3.0	0.9	OK
960 min	Summer	34.422	0.072	0.0	2.4	2.4	0.8	OK
1440 min	Summer	34.410	0.060	0.0	1.7	1.7	0.7	OK
2160 min	Summer	34.400	0.050	0.0	1.3	1.3	0.5	OK
2880 min	Summer	34.394	0.044	0.0	1.0	1.0	0.5	OK
4320 min	Summer	34.387	0.037	0.0	0.8	0.8	0.4	OK
5760 min	Summer	34.383	0.033	0.0	0.6	0.6	0.4	OK
7200 min	Summer	34.380	0.030	0.0	0.5	0.5	0.3	OK
8640 min	Summer	34.378	0.028	0.0	0.4	0.4	0.3	OK
10080 min	Summer	34.376	0.026	0.0	0.4	0.4	0.3	OK
15 min	Winter	35.066	0.716	0.0	5.0	5.0	7.8	OK

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	118.613	0.0	10.0	15
30 min Summer	79.413	0.0	13.4	24
60 min Summer	50.812	0.0	17.1	42
120 min Summer	31.468	0.0	21.2	76
180 min Summer	23.466	0.0	23.8	104
240 min Summer	18.940	0.0	25.6	132
360 min Summer	13.882	0.0	28.1	186
480 min Summer	11.143	0.0	30.1	246
600 min Summer	9.389	0.0	31.7	306
720 min Summer	8.158	0.0	33.0	366
960 min Summer	6.531	0.0	35.3	490
1440 min Summer	4.764	0.0	38.6	734
2160 min Summer	3.468	0.0	42.1	1084
2880 min Summer	2.766	0.0	44.8	1464
4320 min Summer	2.007	0.0	48.8	2160
5760 min Summer	1.596	0.0	51.7	2848
7200 min Summer	1.336	0.0	54.1	3584
8640 min Summer	1.154	0.0	56.1	4360
10080 min Summer	1.020	0.0	57.8	5136
15 min Winter	118.613	0.0	11.2	15

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Innovyze Source Control 2020.1		

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)	18.000	Shortest Storm (mins)	15
Ratio R	0.360	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.045

Time (mins)	Area
From:	To: (ha)
0	4 0.045

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Model Details Storage is Online Cover Level (m) 35.900 Cellular Storage Structure Invert Level (m) 34.350 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><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>11.5</td><td>11.5</td><td>1.300</td><td>11.5</td><td>29.1</td></tr><tr><td>0.100</td><td>11.5</td><td>12.9</td><td>1.400</td><td>11.5</td><td>30.5</td></tr><tr><td>0.200</td><td>11.5</td><td>14.2</td><td>1.500</td><td>11.5</td><td>31.8</td></tr><tr><td>0.300</td><td>11.5</td><td>15.6</td><td>1.600</td><td>11.5</td><td>33.2</td></tr><tr><td>0.400</td><td>11.5</td><td>16.9</td><td>1.700</td><td>11.5</td><td>34.6</td></tr><tr><td>0.500</td><td>11.5</td><td>18.3</td><td>1.800</td><td>11.5</td><td>35.9</td></tr><tr><td>0.600</td><td>11.5</td><td>19.6</td><td>1.900</td><td>11.5</td><td>37.3</td></tr><tr><td>0.700</td><td>11.5</td><td>21.0</td><td>2.000</td><td>11.5</td><td>38.6</td></tr><tr><td>0.800</td><td>11.5</td><td>22.4</td><td>2.100</td><td>11.5</td><td>40.0</td></tr><tr><td>0.900</td><td>11.5</td><td>23.7</td><td>2.200</td><td>11.5</td><td>41.3</td></tr><tr><td>1.000</td><td>11.5</td><td>25.1</td><td>2.300</td><td>11.5</td><td>42.7</td></tr><tr><td>1.100</td><td>11.5</td><td>26.4</td><td>2.400</td><td>11.5</td><td>44.1</td></tr><tr><td>1.200</td><td>11.5</td><td>27.8</td><td>2.500</td><td>11.5</td><td>45.4</td></tr></tbody></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SHE-0109-5000-0800-5000 Design Head (m) 0.800 Design Flow (l/s) 5.0 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 109 Invert Level (m) 34.350 Minimum Outlet Pipe Diameter (mm) 150 Suggested Manhole Diameter (mm) 1200 <table><thead><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>Design Point (Calculated)</td><td>0.800</td><td>5.0</td><td>Kick-Flo®</td><td>0.537</td><td>4.2</td></tr><tr><td>Flush-Flo™</td><td>0.241</td><td>5.0</td><td>Mean Flow over Head Range</td><td>-</td><td>4.3</td></tr></tbody></table> 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 <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>0.100</td><td>3.7</td><td>0.200</td><td>5.0</td><td>0.300</td><td>5.0</td><td>0.400</td><td>4.8</td></tr></tbody></table>						Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	11.5	11.5	1.300	11.5	29.1	0.100	11.5	12.9	1.400	11.5	30.5	0.200	11.5	14.2	1.500	11.5	31.8	0.300	11.5	15.6	1.600	11.5	33.2	0.400	11.5	16.9	1.700	11.5	34.6	0.500	11.5	18.3	1.800	11.5	35.9	0.600	11.5	19.6	1.900	11.5	37.3	0.700	11.5	21.0	2.000	11.5	38.6	0.800	11.5	22.4	2.100	11.5	40.0	0.900	11.5	23.7	2.200	11.5	41.3	1.000	11.5	25.1	2.300	11.5	42.7	1.100	11.5	26.4	2.400	11.5	44.1	1.200	11.5	27.8	2.500	11.5	45.4	Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	0.800	5.0	Kick-Flo®	0.537	4.2	Flush-Flo™	0.241	5.0	Mean Flow over Head Range	-	4.3	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	3.7	0.200	5.0	0.300	5.0	0.400	4.8
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