

Scott Hughes Design Ltd		Page 1					
The Flint Glass Works 64 Jersey Street Manchester M4 6JW		Goulden Street New Cross					
Date 23/08/2018 File Oldham Road Source Cont...		Designed by AB Checked by PG					
Micro Drainage		Source Control 2017.1					
Summary of Results for 30 year Return Period							
Half Drain Time : 10 minutes.							
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	7.670	0.170	0.0	10.1	10.1	7.3	O K
30 min Summer	7.711	0.211	0.0	10.6	10.6	9.0	O K
60 min Summer	7.718	0.218	0.0	10.7	10.7	9.3	O K
120 min Summer	7.689	0.189	0.0	10.4	10.4	8.1	O K
180 min Summer	7.661	0.161	0.0	9.7	9.7	6.9	O K
240 min Summer	7.644	0.144	0.0	8.7	8.7	6.1	O K
360 min Summer	7.621	0.121	0.0	7.1	7.1	5.2	O K
480 min Summer	7.607	0.107	0.0	5.9	5.9	4.6	O K
600 min Summer	7.598	0.098	0.0	5.2	5.2	4.2	O K
720 min Summer	7.590	0.090	0.0	4.5	4.5	3.9	O K
960 min Summer	7.580	0.080	0.0	3.7	3.7	3.4	O K
1440 min Summer	7.568	0.068	0.0	2.8	2.8	2.9	O K
2160 min Summer	7.558	0.058	0.0	2.1	2.1	2.5	O K
2880 min Summer	7.551	0.051	0.0	1.7	1.7	2.2	O K
4320 min Summer	7.544	0.044	0.0	1.2	1.2	1.9	O K
5760 min Summer	7.539	0.039	0.0	1.0	1.0	1.7	O K
7200 min Summer	7.536	0.036	0.0	0.8	0.8	1.5	O K
8640 min Summer	7.533	0.033	0.0	0.7	0.7	1.4	O K
10080 min Summer	7.531	0.031	0.0	0.7	0.7	1.3	O K
15 min Winter	7.692	0.192	0.0	10.4	10.4	8.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
15 min Summer	65.439	0.0	15.9	27			
30 min Summer	43.443	0.0	21.2	35			
60 min Summer	27.653	0.0	26.9	50			
120 min Summer	17.113	0.0	33.3	80			
180 min Summer	12.792	0.0	37.4	108			
240 min Summer	10.359	0.0	40.4	138			
360 min Summer	7.651	0.0	44.7	198			
480 min Summer	6.171	0.0	48.1	258			
600 min Summer	5.219	0.0	50.9	318			
720 min Summer	4.550	0.0	53.2	378			
960 min Summer	3.662	0.0	57.1	498			
1440 min Summer	2.694	0.0	63.0	738			
2160 min Summer	1.978	0.0	69.4	1104			
2880 min Summer	1.588	0.0	74.3	1472			
4320 min Summer	1.164	0.0	81.7	2176			
5760 min Summer	0.933	0.0	87.3	2936			
7200 min Summer	0.785	0.0	91.9	3672			
8640 min Summer	0.682	0.0	95.7	4400			
10080 min Summer	0.605	0.0	99.1	5024			
15 min Winter	65.439	0.0	17.8	27			
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Summary of Results for 30 year Return Period							
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
30 min Winter	7.741	0.241	0.0	10.9	10.9	10.3	O K
60 min Winter	7.738	0.238	0.0	10.9	10.9	10.2	O K
120 min Winter	7.679	0.179	0.0	10.2	10.2	7.6	O K
180 min Winter	7.645	0.145	0.0	8.7	8.7	6.2	O K
240 min Winter	7.625	0.125	0.0	7.4	7.4	5.4	O K
360 min Winter	7.604	0.104	0.0	5.7	5.7	4.4	O K
480 min Winter	7.591	0.091	0.0	4.6	4.6	3.9	O K
600 min Winter	7.583	0.083	0.0	3.9	3.9	3.5	O K
720 min Winter	7.577	0.077	0.0	3.5	3.5	3.3	O K
960 min Winter	7.568	0.068	0.0	2.8	2.8	2.9	O K
1440 min Winter	7.557	0.057	0.0	2.1	2.1	2.5	O K
2160 min Winter	7.549	0.049	0.0	1.5	1.5	2.1	O K
2880 min Winter	7.543	0.043	0.0	1.2	1.2	1.8	O K
4320 min Winter	7.537	0.037	0.0	0.9	0.9	1.6	O K
5760 min Winter	7.533	0.033	0.0	0.7	0.7	1.4	O K
7200 min Winter	7.530	0.030	0.0	0.6	0.6	1.3	O K
8640 min Winter	7.528	0.028	0.0	0.5	0.5	1.2	O K
10080 min Winter	7.526	0.026	0.0	0.5	0.5	1.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
30 min Winter	43.443	0.0	23.7	35			
60 min Winter	27.653	0.0	30.2	50			
120 min Winter	17.113	0.0	37.4	80			
180 min Winter	12.792	0.0	41.9	108			
240 min Winter	10.359	0.0	45.2	138			
360 min Winter	7.651	0.0	50.1	198			
480 min Winter	6.171	0.0	53.9	258			
600 min Winter	5.219	0.0	57.0	320			
720 min Winter	4.550	0.0	59.6	378			
960 min Winter	3.662	0.0	64.0	502			
1440 min Winter	2.694	0.0	70.6	746			
2160 min Winter	1.978	0.0	77.8	1092			
2880 min Winter	1.588	0.0	83.2	1468			
4320 min Winter	1.164	0.0	91.5	2168			
5760 min Winter	0.933	0.0	97.8	2864			
7200 min Winter	0.785	0.0	102.9	3600			
8640 min Winter	0.682	0.0	107.2	4408			
10080 min Winter	0.605	0.0	111.0	5080			
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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.357	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.130

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.025	8 12	0.025	16 20	0.030
4 8	0.025	12 16	0.025		

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 7.500 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	45.0	45.0	2.600	0.0	63.8
0.200	45.0	50.4	2.800	0.0	63.8
0.400	45.0	55.7	3.000	0.0	63.8
0.600	45.0	61.1	3.200	0.0	63.8
0.800	0.0	63.8	3.400	0.0	63.8
1.000	0.0	63.8	3.600	0.0	63.8
1.200	0.0	63.8	3.800	0.0	63.8
1.400	0.0	63.8	4.000	0.0	63.8
1.600	0.0	63.8	4.200	0.0	63.8
1.800	0.0	63.8	4.400	0.0	63.8
2.000	0.0	63.8	4.600	0.0	63.8
2.200	0.0	63.8	4.800	0.0	63.8
2.400	0.0	63.8	5.000	0.0	63.8

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0149-1170-1500-1170
Design Head (m) 1.500
Design Flow (l/s) 11.7
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 149
Invert Level (m) 7.500
Minimum Outlet Pipe Diameter (mm) 225
Suggested Manhole Diameter (mm) 1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	11.7
Flush-Flo™	0.440	11.6
Kick-Flo®	0.937	9.4
Mean Flow over Head Range	-	10.1

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

