

2nd Floor, 296 St Vincent Street
Glasgow
G2 5RU



Date 01/02/2023 10:21
File 4488 SC B&C 01.SRCX

Designed by Alastair Tills
Checked by

Micro Drainage Source Control 2020.1.3

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

Half Drain Time : 53 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	9.308	0.758	0.0	11.8	11.8	43.2	O K
30 min Summer	9.459	0.909	0.0	11.8	11.8	51.8	O K
60 min Summer	9.516	0.966	0.0	11.8	11.8	55.1	O K
120 min Summer	9.398	0.848	0.0	11.8	11.8	48.3	O K
180 min Summer	9.276	0.726	0.0	11.8	11.8	41.4	O K
240 min Summer	9.168	0.618	0.0	11.8	11.8	35.2	O K
360 min Summer	8.997	0.447	0.0	11.6	11.6	25.5	O K
480 min Summer	8.882	0.332	0.0	11.1	11.1	18.9	O K
600 min Summer	8.805	0.255	0.0	10.5	10.5	14.6	O K
720 min Summer	8.755	0.205	0.0	9.9	9.9	11.7	O K
960 min Summer	8.704	0.154	0.0	8.7	8.7	8.8	O K
1440 min Summer	8.668	0.118	0.0	6.5	6.5	6.7	O K
2160 min Summer	8.645	0.095	0.0	4.7	4.7	5.4	O K
2880 min Summer	8.632	0.082	0.0	3.8	3.8	4.7	O K
4320 min Summer	8.619	0.069	0.0	2.8	2.8	3.9	O K
5760 min Summer	8.611	0.061	0.0	2.2	2.2	3.5	O K
7200 min Summer	8.606	0.056	0.0	1.9	1.9	3.2	O K
8640 min Summer	8.603	0.053	0.0	1.7	1.7	3.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	154.424	0.0	51.2	18
30 min Summer	101.444	0.0	67.3	32
60 min Summer	63.462	0.0	84.2	50
120 min Summer	36.383	0.0	96.6	82
180 min Summer	26.052	0.0	103.7	116
240 min Summer	20.493	0.0	108.8	148
360 min Summer	14.560	0.0	115.9	208
480 min Summer	11.414	0.0	121.2	266
600 min Summer	9.451	0.0	125.4	322
720 min Summer	8.102	0.0	129.0	380
960 min Summer	6.362	0.0	135.1	492
1440 min Summer	4.542	0.0	144.7	736
2160 min Summer	3.265	0.0	156.0	1100
2880 min Summer	2.598	0.0	165.5	1468
4320 min Summer	1.907	0.0	182.3	2184
5760 min Summer	1.547	0.0	197.1	2904
7200 min Summer	1.325	0.0	211.0	3672
8640 min Summer	1.173	0.0	224.2	4296

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m ³)	Status
10080 min Summer	8.600	0.050	0.0	1.5	1.5	2.8	O K
15 min Winter	9.413	0.863	0.0	11.8	11.8	49.2	O K
30 min Winter	9.600	1.050	0.0	11.8	11.8	59.9	O K
60 min Winter	9.679	1.129	0.0	11.8	11.8	64.4	O K
120 min Winter	9.505	0.955	0.0	11.8	11.8	54.5	O K
180 min Winter	9.322	0.772	0.0	11.8	11.8	44.0	O K
240 min Winter	9.161	0.611	0.0	11.8	11.8	34.8	O K
360 min Winter	8.928	0.378	0.0	11.4	11.4	21.6	O K
480 min Winter	8.795	0.245	0.0	10.4	10.4	14.0	O K
600 min Winter	8.724	0.174	0.0	9.4	9.4	9.9	O K
720 min Winter	8.697	0.147	0.0	8.3	8.3	8.4	O K
960 min Winter	8.669	0.119	0.0	6.6	6.6	6.8	O K
1440 min Winter	8.645	0.095	0.0	4.7	4.7	5.4	O K
2160 min Winter	8.628	0.078	0.0	3.4	3.4	4.4	O K
2880 min Winter	8.618	0.068	0.0	2.7	2.7	3.9	O K
4320 min Winter	8.607	0.057	0.0	2.0	2.0	3.3	O K
5760 min Winter	8.601	0.051	0.0	1.6	1.6	2.9	O K
7200 min Winter	8.597	0.047	0.0	1.4	1.4	2.7	O K
8640 min Winter	8.594	0.044	0.0	1.2	1.2	2.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
10080 min Summer	1.063	0.0	237.0	4984
15 min Winter	154.424	0.0	57.4	18
30 min Winter	101.444	0.0	75.4	32
60 min Winter	63.462	0.0	94.3	58
120 min Winter	36.383	0.0	108.2	90
180 min Winter	26.052	0.0	116.2	126
240 min Winter	20.493	0.0	121.8	158
360 min Winter	14.560	0.0	129.9	216
480 min Winter	11.414	0.0	135.7	272
600 min Winter	9.451	0.0	140.5	322
720 min Winter	8.102	0.0	144.5	376
960 min Winter	6.362	0.0	151.3	494
1440 min Winter	4.542	0.0	162.1	736
2160 min Winter	3.265	0.0	174.7	1084
2880 min Winter	2.598	0.0	185.4	1468
4320 min Winter	1.907	0.0	204.1	2204
5760 min Winter	1.547	0.0	220.8	2856
7200 min Winter	1.325	0.0	236.3	3664
8640 min Winter	1.173	0.0	251.1	4320

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

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
10080 min Winter	8.592	0.042	0.0	1.1	1.1	2.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	1.063	0.0	265.4	5136

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Micro Drainage	Source Control 2020.1.3
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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 460581 451568 SE 60581 51568
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.177

Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:
0	2 0.028	From:	To:
		2	4 0.149

Model Details

Storage is Online Cover Level (m) 10.800

Cellular Storage Structure

Invert Level (m) 8.550 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	60.0	0.0	1.201	0.0	0.0
1.200	60.0	0.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0142-1180-2000-1180
 Design Head (m) 2.000
 Design Flow (l/s) 11.8
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 142
 Invert Level (m) 8.550
 Minimum Outlet Pipe Diameter (mm) 225
 Suggested Manhole Diameter (mm) 1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	11.8	Kick-Flo®	1.213	9.3
Flush-Flo™	0.589	11.8	Mean Flow over Head Range	-	10.3

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	5.1	1.200	9.5	3.000	14.3	7.000	21.4
0.200	9.8	1.400	10.0	3.500	15.4	7.500	22.2
0.300	10.9	1.600	10.6	4.000	16.4	8.000	22.9
0.400	11.5	1.800	11.2	4.500	17.3	8.500	23.5
0.500	11.7	2.000	11.8	5.000	18.2	9.000	24.2
0.600	11.8	2.200	12.3	5.500	19.1	9.500	24.8
0.800	11.6	2.400	12.9	6.000	19.9		
1.000	10.9	2.600	13.4	6.500	20.7		