

11 Broomhead Road
Wombell
Barnsley S73 0SA



Date 22/11/2024 11:53
File Attenuation calc.SRCX

Designed by shaun
Checked by

CADS Source Control 2020.1.3

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

Half Drain Time : 26 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	38.913	0.613	0.0	5.0	5.0	10.5	O K
30 min Summer	39.006	0.706	0.0	5.0	5.0	12.1	O K
60 min Summer	39.022	0.722	0.0	5.0	5.0	12.3	O K
120 min Summer	38.942	0.642	0.0	5.0	5.0	11.0	O K
180 min Summer	38.817	0.517	0.0	5.0	5.0	8.8	O K
240 min Summer	38.697	0.397	0.0	5.0	5.0	6.8	O K
360 min Summer	38.535	0.235	0.0	5.0	5.0	4.0	O K
480 min Summer	38.454	0.154	0.0	4.8	4.8	2.6	O K
600 min Summer	38.421	0.121	0.0	4.4	4.4	2.1	O K
720 min Summer	38.406	0.106	0.0	3.9	3.9	1.8	O K
960 min Summer	38.388	0.088	0.0	3.2	3.2	1.5	O K
1440 min Summer	38.372	0.072	0.0	2.3	2.3	1.2	O K
2160 min Summer	38.359	0.059	0.0	1.7	1.7	1.0	O K
2880 min Summer	38.352	0.052	0.0	1.4	1.4	0.9	O K
4320 min Summer	38.343	0.043	0.0	1.0	1.0	0.7	O K
5760 min Summer	38.338	0.038	0.0	0.8	0.8	0.7	O K
7200 min Summer	38.335	0.035	0.0	0.7	0.7	0.6	O K
8640 min Summer	38.332	0.032	0.0	0.6	0.6	0.5	O K
10080 min Summer	38.330	0.030	0.0	0.5	0.5	0.5	O K
15 min Winter	39.000	0.700	0.0	5.0	5.0	12.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	126.478	0.0	13.7	16
30 min Summer	84.424	0.0	18.4	26
60 min Summer	53.779	0.0	23.4	44
120 min Summer	33.103	0.0	28.8	78
180 min Summer	24.574	0.0	32.1	112
240 min Summer	19.761	0.0	34.4	140
360 min Summer	14.466	0.0	37.7	196
480 min Summer	11.596	0.0	40.3	252
600 min Summer	9.760	0.0	42.4	308
720 min Summer	8.474	0.0	44.2	368
960 min Summer	6.774	0.0	47.1	490
1440 min Summer	4.933	0.0	51.5	732
2160 min Summer	3.584	0.0	56.1	1096
2880 min Summer	2.854	0.0	59.6	1456
4320 min Summer	2.067	0.0	64.7	2144
5760 min Summer	1.642	0.0	68.6	2936
7200 min Summer	1.373	0.0	71.7	3664
8640 min Summer	1.186	0.0	74.3	4400
10080 min Summer	1.048	0.0	76.6	5000
15 min Winter	126.478	0.0	15.4	16

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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
30 min Winter	39.113	0.813	0.0	5.0	5.0	13.9	O K
60 min Winter	39.123	0.823	0.0	5.0	5.0	14.0	O K
120 min Winter	38.983	0.683	0.0	5.0	5.0	11.7	O K
180 min Winter	38.780	0.480	0.0	5.0	5.0	8.2	O K
240 min Winter	38.607	0.307	0.0	5.0	5.0	5.3	O K
360 min Winter	38.438	0.138	0.0	4.7	4.7	2.4	O K
480 min Winter	38.406	0.106	0.0	3.9	3.9	1.8	O K
600 min Winter	38.392	0.092	0.0	3.3	3.3	1.6	O K
720 min Winter	38.382	0.082	0.0	2.9	2.9	1.4	O K
960 min Winter	38.371	0.071	0.0	2.3	2.3	1.2	O K
1440 min Winter	38.359	0.059	0.0	1.7	1.7	1.0	O K
2160 min Winter	38.349	0.049	0.0	1.2	1.2	0.8	O K
2880 min Winter	38.343	0.043	0.0	1.0	1.0	0.7	O K
4320 min Winter	38.336	0.036	0.0	0.7	0.7	0.6	O K
5760 min Winter	38.332	0.032	0.0	0.6	0.6	0.5	O K
7200 min Winter	38.329	0.029	0.0	0.5	0.5	0.5	O K
8640 min Winter	38.327	0.027	0.0	0.4	0.4	0.5	O K
10080 min Winter	38.325	0.025	0.0	0.4	0.4	0.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	84.424	0.0	20.6	28
60 min Winter	53.779	0.0	26.2	46
120 min Winter	33.103	0.0	32.2	84
180 min Winter	24.574	0.0	35.9	118
240 min Winter	19.761	0.0	38.5	146
360 min Winter	14.466	0.0	42.3	194
480 min Winter	11.596	0.0	45.2	248
600 min Winter	9.760	0.0	47.5	308
720 min Winter	8.474	0.0	49.5	368
960 min Winter	6.774	0.0	52.8	490
1440 min Winter	4.933	0.0	57.7	716
2160 min Winter	3.584	0.0	62.9	1084
2880 min Winter	2.854	0.0	66.7	1448
4320 min Winter	2.067	0.0	72.5	2168
5760 min Winter	1.642	0.0	76.8	2880
7200 min Winter	1.373	0.0	80.3	3664
8640 min Winter	1.186	0.0	83.2	4384
10080 min Winter	1.048	0.0	85.8	5144

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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)	19.000	Shortest Storm (mins)	15
Ratio R	0.365	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.058

Time (mins)		Area
From:	To:	(ha)
0	4	0.058

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Model Details

Storage is Online Cover Level (m) 39.700

Cellular Storage Structure

Invert Level (m) 38.300 Safety Factor 1.0
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	18.0	18.0	0.900	0.0	32.4
0.800	18.0	32.4			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0108-5000-0850-5000
Design Head (m) 0.850
Design Flow (l/s) 5.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 108
Invert Level (m) 38.300
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.850	5.0
Flush-Flo™	0.255	5.0
Kick-Flo®	0.562	4.1
Mean Flow over Head Range	-	4.3

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	3.7	1.200	5.9	3.000	9.0	7.000	13.5
0.200	4.9	1.400	6.3	3.500	9.7	7.500	14.0
0.300	5.0	1.600	6.7	4.000	10.3	8.000	14.4
0.400	4.8	1.800	7.1	4.500	10.9	8.500	14.8
0.500	4.6	2.000	7.5	5.000	11.5	9.000	15.2
0.600	4.3	2.200	7.8	5.500	12.0	9.500	15.6
0.800	4.9	2.400	8.1	6.000	12.5		
1.000	5.4	2.600	8.4	6.500	13.0		