

11 Broomhead Road
Wombell
Barnsley S73 0SA



Date 27/03/2025 13:52
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 : 7 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	57.467	0.517	0.0	18.9	18.9	8.6	O K
30 min Summer	57.595	0.645	0.0	18.9	18.9	10.7	O K
60 min Summer	57.513	0.563	0.0	18.9	18.9	9.4	O K
120 min Summer	57.204	0.254	0.0	18.9	18.9	4.2	O K
180 min Summer	57.029	0.079	0.0	18.5	18.5	1.3	O K
240 min Summer	56.981	0.031	0.0	16.3	16.3	0.5	O K
360 min Summer	56.950	0.000	0.0	12.6	12.6	0.0	O K
480 min Summer	56.950	0.000	0.0	10.3	10.3	0.0	O K
600 min Summer	56.950	0.000	0.0	8.8	8.8	0.0	O K
720 min Summer	56.950	0.000	0.0	7.7	7.7	0.0	O K
960 min Summer	56.950	0.000	0.0	6.1	6.1	0.0	O K
1440 min Summer	56.950	0.000	0.0	4.5	4.5	0.0	O K
2160 min Summer	56.950	0.000	0.0	3.3	3.3	0.0	O K
2880 min Summer	56.950	0.000	0.0	2.6	2.6	0.0	O K
4320 min Summer	56.950	0.000	0.0	1.9	1.9	0.0	O K
5760 min Summer	56.950	0.000	0.0	1.5	1.5	0.0	O K
7200 min Summer	56.950	0.000	0.0	1.3	1.3	0.0	O K
8640 min Summer	56.950	0.000	0.0	1.1	1.1	0.0	O K
10080 min Summer	56.950	0.000	0.0	1.0	1.0	0.0	O K
15 min Winter	57.613	0.663	0.0	18.9	18.9	11.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	125.746	0.0	25.8	20
30 min Summer	84.173	0.0	34.7	28
60 min Summer	53.779	0.0	44.8	44
120 min Summer	33.195	0.0	54.9	74
180 min Summer	24.676	0.0	61.1	100
240 min Summer	19.858	0.0	65.6	128
360 min Summer	14.561	0.0	72.1	0
480 min Summer	11.683	0.0	77.1	0
600 min Summer	9.841	0.0	81.2	0
720 min Summer	8.549	0.0	84.6	0
960 min Summer	6.841	0.0	90.3	0
1440 min Summer	4.987	0.0	98.7	0
2160 min Summer	3.628	0.0	107.8	0
2880 min Summer	2.892	0.0	114.5	0
4320 min Summer	2.096	0.0	124.5	0
5760 min Summer	1.667	0.0	132.0	0
7200 min Summer	1.394	0.0	138.0	0
8640 min Summer	1.205	0.0	143.1	0
10080 min Summer	1.066	0.0	147.7	0
15 min Winter	125.746	0.0	29.1	20

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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	57.719	0.769	0.0	18.9	18.9	12.8	O K
60 min Winter	57.546	0.596	0.0	18.9	18.9	9.9	O K
120 min Winter	57.069	0.119	0.0	18.7	18.7	2.0	O K
180 min Winter	56.974	0.024	0.0	15.6	15.6	0.4	O K
240 min Winter	56.950	0.000	0.0	12.7	12.7	0.0	O K
360 min Winter	56.950	0.000	0.0	9.4	9.4	0.0	O K
480 min Winter	56.950	0.000	0.0	7.6	7.6	0.0	O K
600 min Winter	56.950	0.000	0.0	6.4	6.4	0.0	O K
720 min Winter	56.950	0.000	0.0	5.5	5.5	0.0	O K
960 min Winter	56.950	0.000	0.0	4.4	4.4	0.0	O K
1440 min Winter	56.950	0.000	0.0	3.2	3.2	0.0	O K
2160 min Winter	56.950	0.000	0.0	2.4	2.4	0.0	O K
2880 min Winter	56.950	0.000	0.0	1.9	1.9	0.0	O K
4320 min Winter	56.950	0.000	0.0	1.4	1.4	0.0	O K
5760 min Winter	56.950	0.000	0.0	1.1	1.1	0.0	O K
7200 min Winter	56.950	0.000	0.0	0.9	0.9	0.0	O K
8640 min Winter	56.950	0.000	0.0	0.8	0.8	0.0	O K
10080 min Winter	56.950	0.000	0.0	0.7	0.7	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	84.173	0.0	39.1	29
60 min Winter	53.779	0.0	49.1	46
120 min Winter	33.195	0.0	61.3	72
180 min Winter	24.676	0.0	68.4	98
240 min Winter	19.858	0.0	73.4	0
360 min Winter	14.561	0.0	80.7	0
480 min Winter	11.683	0.0	86.4	0
600 min Winter	9.841	0.0	90.9	0
720 min Winter	8.549	0.0	94.8	0
960 min Winter	6.841	0.0	101.1	0
1440 min Winter	4.987	0.0	110.6	0
2160 min Winter	3.628	0.0	120.7	0
2880 min Winter	2.892	0.0	128.2	0
4320 min Winter	2.096	0.0	139.5	0
5760 min Winter	1.667	0.0	147.8	0
7200 min Winter	1.394	0.0	154.6	0
8640 min Winter	1.205	0.0	160.3	0
10080 min Winter	1.066	0.0	165.4	0

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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	0.359	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.110

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4	0.037	4	8	0.037
				8	12
					0.037

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Model Details

Storage is Online Cover Level (m) 58.500

Cellular Storage Structure

Invert Level (m) 56.950 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	17.5	17.5	0.900	0.0	32.7
0.800	17.5	32.7			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0194-1890-0950-1890
 Design Head (m) 0.950
 Design Flow (l/s) 18.9
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 194
 Invert Level (m) 56.800
 Minimum Outlet Pipe Diameter (mm) 225
 Suggested Manhole Diameter (mm) 1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.950	18.9
Flush-Flo™	0.327	18.9
Kick-Flo®	0.688	16.2
Mean Flow over Head Range	-	15.8

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	6.7	1.200	21.1	3.000	32.8	7.000	49.3
0.200	18.1	1.400	22.7	3.500	35.3	7.500	51.0
0.300	18.8	1.600	24.2	4.000	37.6	8.000	52.6
0.400	18.8	1.800	25.6	4.500	39.8	8.500	54.2
0.500	18.4	2.000	27.0	5.000	41.9	9.000	55.7
0.600	17.7	2.200	28.2	5.500	43.9	9.500	57.2
0.800	17.4	2.400	29.4	6.000	45.8		
1.000	19.4	2.600	30.6	6.500	47.6		