

11 Broomhead Road
Wombell
Barnsley S73 0SA



Date 13/05/2025 14:01
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	57.634	0.284	0.0	18.8	18.8	9.4	O K
30 min Summer	57.703	0.353	0.0	18.8	18.8	11.8	O K
60 min Summer	57.662	0.312	0.0	18.8	18.8	10.4	O K
120 min Summer	57.532	0.182	0.0	18.8	18.8	6.1	O K
180 min Summer	57.450	0.100	0.0	18.3	18.3	3.3	O K
240 min Summer	57.422	0.072	0.0	15.9	15.9	2.4	O K
360 min Summer	57.393	0.043	0.0	12.3	12.3	1.4	O K
480 min Summer	57.376	0.026	0.0	10.1	10.1	0.9	O K
600 min Summer	57.364	0.014	0.0	8.6	8.6	0.5	O K
720 min Summer	57.356	0.006	0.0	7.6	7.6	0.2	O K
960 min Summer	57.350	0.000	0.0	6.1	6.1	0.0	O K
1440 min Summer	57.350	0.000	0.0	4.5	4.5	0.0	O K
2160 min Summer	57.350	0.000	0.0	3.3	3.3	0.0	O K
2880 min Summer	57.350	0.000	0.0	2.6	2.6	0.0	O K
4320 min Summer	57.350	0.000	0.0	1.9	1.9	0.0	O K
5760 min Summer	57.350	0.000	0.0	1.5	1.5	0.0	O K
7200 min Summer	57.350	0.000	0.0	1.3	1.3	0.0	O K
8640 min Summer	57.350	0.000	0.0	1.1	1.1	0.0	O K
10080 min Summer	57.350	0.000	0.0	1.0	1.0	0.0	O K
15 min Winter	57.708	0.358	0.0	18.8	18.8	11.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	125.746	0.0	25.9	19
30 min Summer	84.173	0.0	34.7	28
60 min Summer	53.779	0.0	44.2	44
120 min Summer	33.195	0.0	54.8	74
180 min Summer	24.676	0.0	61.2	100
240 min Summer	19.858	0.0	65.6	130
360 min Summer	14.561	0.0	72.0	190
480 min Summer	11.683	0.0	77.1	250
600 min Summer	9.841	0.0	81.2	310
720 min Summer	8.549	0.0	84.6	370
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	57.778	0.428	0.0	18.8	18.8	14.0	O K
60 min Winter	57.682	0.332	0.0	18.8	18.8	11.1	O K
120 min Winter	57.472	0.122	0.0	18.6	18.6	4.1	O K
180 min Winter	57.418	0.068	0.0	15.4	15.4	2.2	O K
240 min Winter	57.395	0.045	0.0	12.6	12.6	1.5	O K
360 min Winter	57.370	0.020	0.0	9.3	9.3	0.7	O K
480 min Winter	57.356	0.006	0.0	7.6	7.6	0.2	O K
600 min Winter	57.350	0.000	0.0	6.4	6.4	0.0	O K
720 min Winter	57.350	0.000	0.0	5.5	5.5	0.0	O K
960 min Winter	57.350	0.000	0.0	4.4	4.4	0.0	O K
1440 min Winter	57.350	0.000	0.0	3.2	3.2	0.0	O K
2160 min Winter	57.350	0.000	0.0	2.4	2.4	0.0	O K
2880 min Winter	57.350	0.000	0.0	1.9	1.9	0.0	O K
4320 min Winter	57.350	0.000	0.0	1.4	1.4	0.0	O K
5760 min Winter	57.350	0.000	0.0	1.1	1.1	0.0	O K
7200 min Winter	57.350	0.000	0.0	0.9	0.9	0.0	O K
8640 min Winter	57.350	0.000	0.0	0.8	0.8	0.0	O K
10080 min Winter	57.350	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	38.9	29
60 min Winter	53.779	0.0	49.8	46
120 min Winter	33.195	0.0	61.3	74
180 min Winter	24.676	0.0	68.4	100
240 min Winter	19.858	0.0	73.4	130
360 min Winter	14.561	0.0	80.7	190
480 min Winter	11.683	0.0	86.4	250
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:	(ha)	From: To:	(ha)	From: To:	(ha)
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) 57.350 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	35.0	35.0	0.500	0.0	44.6
0.400	35.0	44.6			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0199-1890-0550-1890
 Design Head (m) 0.550
 Design Flow (l/s) 18.9
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 199
 Invert Level (m) 57.250
 Minimum Outlet Pipe Diameter (mm) 225
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.550	18.9
Flush-Flo™	0.285	18.8
Kick-Flo®	0.455	17.3
Mean Flow over Head Range	-	14.5

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	6.9	1.200	27.4	3.000	42.6	7.000	64.1
0.200	18.3	1.400	29.5	3.500	45.9	7.500	66.3
0.300	18.8	1.600	31.5	4.000	49.0	8.000	68.6
0.400	18.2	1.800	33.3	4.500	51.9	8.500	70.7
0.500	18.1	2.000	35.0	5.000	54.6	9.000	72.8
0.600	19.7	2.200	36.7	5.500	57.2	9.500	74.8
0.800	22.6	2.400	38.3	6.000	59.2		
1.000	25.1	2.600	39.8	6.500	61.7		