

11 Broomhead Road  
Wombell  
Barnsley S73 0SA



Date 22/06/2026 16:05  
File Attenuation calculation...

Designed by shaun  
Checked by

CADS Source Control 2020.1.3

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 56 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max $\Sigma$ Outflow (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	161.320	0.470	0.0	3.0	3.0	11.6	O K
30 min Summer	161.468	0.618	0.0	3.0	3.0	15.3	O K
60 min Summer	161.557	0.707	0.0	3.0	3.0	17.5	O K
120 min Summer	161.567	0.717	0.0	3.0	3.0	17.7	O K
180 min Summer	161.535	0.685	0.0	3.0	3.0	16.9	O K
240 min Summer	161.492	0.642	0.0	3.0	3.0	15.9	O K
360 min Summer	161.403	0.553	0.0	3.0	3.0	13.7	O K
480 min Summer	161.292	0.442	0.0	3.0	3.0	10.9	O K
600 min Summer	161.195	0.345	0.0	3.0	3.0	8.5	O K
720 min Summer	161.117	0.267	0.0	3.0	3.0	6.6	O K
960 min Summer	161.010	0.160	0.0	3.0	3.0	3.9	O K
1440 min Summer	160.914	0.064	0.0	2.7	2.7	1.6	O K
2160 min Summer	160.882	0.032	0.0	2.1	2.1	0.8	O K
2880 min Summer	160.868	0.018	0.0	1.7	1.7	0.5	O K
4320 min Summer	160.855	0.005	0.0	1.2	1.2	0.1	O K
5760 min Summer	160.850	0.000	0.0	1.0	1.0	0.0	O K
7200 min Summer	160.850	0.000	0.0	0.8	0.8	0.0	O K
8640 min Summer	160.850	0.000	0.0	0.7	0.7	0.0	O K
10080 min Summer	160.850	0.000	0.0	0.6	0.6	0.0	O K
15 min Winter	161.320	0.470	0.0	3.0	3.0	11.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	127.128	0.0	14.9	23
30 min Summer	86.806	0.0	20.4	35
60 min Summer	56.615	0.0	26.6	60
120 min Summer	35.593	0.0	33.4	92
180 min Summer	26.672	0.0	37.6	128
240 min Summer	21.566	0.0	40.6	162
360 min Summer	16.005	0.0	45.2	232
480 min Summer	12.929	0.0	48.6	294
600 min Summer	10.946	0.0	51.4	352
720 min Summer	9.547	0.0	53.8	410
960 min Summer	7.687	0.0	57.8	520
1440 min Summer	5.651	0.0	63.7	744
2160 min Summer	4.143	0.0	70.1	1100
2880 min Summer	3.319	0.0	74.9	1468
4320 min Summer	2.423	0.0	82.0	2204
5760 min Summer	1.939	0.0	87.5	0
7200 min Summer	1.632	0.0	92.1	0
8640 min Summer	1.418	0.0	96.0	0
10080 min Summer	1.259	0.0	99.4	0
15 min Winter	127.128	0.0	14.9	23

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Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status
30 min Winter	161.470	0.620	0.0	3.0	3.0	15.3	O K
60 min Winter	161.561	0.711	0.0	3.0	3.0	17.6	O K
120 min Winter	161.555	0.705	0.0	3.0	3.0	17.4	O K
180 min Winter	161.500	0.650	0.0	3.0	3.0	16.1	O K
240 min Winter	161.427	0.577	0.0	3.0	3.0	14.3	O K
360 min Winter	161.251	0.401	0.0	3.0	3.0	9.9	O K
480 min Winter	161.107	0.257	0.0	3.0	3.0	6.4	O K
600 min Winter	161.008	0.158	0.0	3.0	3.0	3.9	O K
720 min Winter	160.947	0.097	0.0	2.9	2.9	2.4	O K
960 min Winter	160.899	0.049	0.0	2.5	2.5	1.2	O K
1440 min Winter	160.874	0.024	0.0	1.9	1.9	0.6	O K
2160 min Winter	160.859	0.009	0.0	1.4	1.4	0.2	O K
2880 min Winter	160.851	0.001	0.0	1.1	1.1	0.0	O K
4320 min Winter	160.850	0.000	0.0	0.8	0.8	0.0	O K
5760 min Winter	160.850	0.000	0.0	0.6	0.6	0.0	O K
7200 min Winter	160.850	0.000	0.0	0.5	0.5	0.0	O K
8640 min Winter	160.850	0.000	0.0	0.5	0.5	0.0	O K
10080 min Winter	160.850	0.000	0.0	0.4	0.4	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	86.806	0.0	20.4	35
60 min Winter	56.615	0.0	26.6	60
120 min Winter	35.593	0.0	33.4	98
180 min Winter	26.672	0.0	37.6	136
240 min Winter	21.566	0.0	40.6	174
360 min Winter	16.005	0.0	45.1	240
480 min Winter	12.929	0.0	48.6	298
600 min Winter	10.946	0.0	51.4	350
720 min Winter	9.547	0.0	53.8	400
960 min Winter	7.687	0.0	57.8	500
1440 min Winter	5.651	0.0	63.7	736
2160 min Winter	4.143	0.0	70.1	1096
2880 min Winter	3.319	0.0	74.9	1468
4320 min Winter	2.423	0.0	82.0	0
5760 min Winter	1.939	0.0	87.5	0
7200 min Winter	1.632	0.0	92.1	0
8640 min Winter	1.418	0.0	96.0	0
10080 min Winter	1.259	0.0	99.4	0

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	19.300	Shortest Storm (mins)	15
Ratio R	0.319	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.047

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0	4 0.016	4	8 0.016	8	12 0.016

Shaun Tonge Engineering		Page 4
11 Broomhead Road Wombell Barnsley S73 0SA		
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Model Details

Storage is Online Cover Level (m) 162.000

Cellular Storage Structure

Invert Level (m) 160.850 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 <sup>2</sup> )	Inf. Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf. Area (m <sup>2</sup> )
0.000	26.0	26.0	0.900	0.0	50.0
0.800	26.0	50.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0085-3000-0850-3000  
 Design Head (m) 0.850  
 Design Flow (l/s) 3.0  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 85  
 Invert Level (m) 160.800  
 Minimum Outlet Pipe Diameter (mm) 100  
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.850	3.0
Flush-Flo™	0.251	3.0
Kick-Flo®	0.541	2.4
Mean Flow over Head Range	-	2.6

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	2.5	1.200	3.5	3.000	5.4	7.000	8.0
0.200	3.0	1.400	3.8	3.500	5.8	7.500	8.3
0.300	3.0	1.600	4.0	4.000	6.2	8.000	8.6
0.400	2.9	1.800	4.2	4.500	6.5	8.500	8.8
0.500	2.6	2.000	4.5	5.000	6.8	9.000	9.0
0.600	2.6	2.200	4.7	5.500	7.2	9.500	9.3
0.800	2.9	2.400	4.8	6.000	7.5		
1.000	3.2	2.600	5.0	6.500	7.7		