

11 Broomhead Road
Wombell
Barnsley S73 0SA



Date 19/10/2020 10:47
File Storage calc.SRCX

Designed by Shaun
Checked by

CADS Source Control 2019.1

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 38 minutes.

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
15 min Summer	9.227	0.727	0.0	13.3	13.3	38.7	O K
30 min Summer	9.438	0.938	0.0	13.3	13.3	49.9	O K
60 min Summer	9.538	1.038	0.0	13.3	13.3	54.6	O K
120 min Summer	9.492	0.992	0.0	13.3	13.3	52.8	O K
180 min Summer	9.403	0.903	0.0	13.3	13.3	48.1	O K
240 min Summer	9.282	0.782	0.0	13.3	13.3	41.6	O K
360 min Summer	9.069	0.569	0.0	13.3	13.3	30.3	O K
480 min Summer	8.913	0.413	0.0	13.3	13.3	22.0	O K
600 min Summer	8.806	0.306	0.0	13.2	13.2	16.3	O K
720 min Summer	8.737	0.237	0.0	12.8	12.8	12.6	O K
960 min Summer	8.671	0.171	0.0	11.7	11.7	9.1	O K
1440 min Summer	8.632	0.132	0.0	8.8	8.8	7.0	O K
2160 min Summer	8.607	0.107	0.0	6.5	6.5	5.7	O K
2880 min Summer	8.593	0.093	0.0	5.1	5.1	5.0	O K
4320 min Summer	8.578	0.078	0.0	3.8	3.8	4.1	O K
5760 min Summer	8.568	0.068	0.0	3.0	3.0	3.6	O K
7200 min Summer	8.562	0.062	0.0	2.5	2.5	3.3	O K
8640 min Summer	8.557	0.057	0.0	2.2	2.2	3.0	O K
10080 min Summer	8.554	0.054	0.0	1.9	1.9	2.8	O K
15 min Winter	9.225	0.725	0.0	13.3	13.3	38.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	116.307	0.0	50.8	22
30 min Summer	78.003	0.0	68.2	33
60 min Summer	49.937	0.0	87.4	54
120 min Summer	30.882	0.0	108.1	88
180 min Summer	22.977	0.0	120.6	122
240 min Summer	18.500	0.0	129.5	154
360 min Summer	13.580	0.0	142.6	216
480 min Summer	10.904	0.0	152.6	272
600 min Summer	9.189	0.0	160.8	328
720 min Summer	7.986	0.0	167.7	384
960 min Summer	6.394	0.0	179.0	496
1440 min Summer	4.665	0.0	195.9	736
2160 min Summer	3.397	0.0	214.0	1100
2880 min Summer	2.709	0.0	227.5	1468
4320 min Summer	1.965	0.0	247.6	2200
5760 min Summer	1.563	0.0	262.6	2936
7200 min Summer	1.308	0.0	274.6	3672
8640 min Summer	1.131	0.0	285.0	4320
10080 min Summer	1.001	0.0	294.2	5112
15 min Winter	116.307	0.0	50.8	22

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Summary of Results for 100 year Return Period (+30%)

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	9.435	0.935	0.0	13.3	13.3	49.7	O K
60 min Winter	9.521	1.021	0.0	13.3	13.3	54.1	O K
120 min Winter	9.437	0.937	0.0	13.3	13.3	49.8	O K
180 min Winter	9.263	0.763	0.0	13.3	13.3	40.6	O K
240 min Winter	9.088	0.588	0.0	13.3	13.3	31.3	O K
360 min Winter	8.833	0.333	0.0	13.2	13.2	17.7	O K
480 min Winter	8.704	0.204	0.0	12.4	12.4	10.9	O K
600 min Winter	8.663	0.163	0.0	11.1	11.1	8.6	O K
720 min Winter	8.644	0.144	0.0	9.7	9.7	7.6	O K
960 min Winter	8.622	0.122	0.0	7.8	7.8	6.5	O K
1440 min Winter	8.600	0.100	0.0	5.8	5.8	5.3	O K
2160 min Winter	8.583	0.083	0.0	4.2	4.2	4.4	O K
2880 min Winter	8.573	0.073	0.0	3.3	3.3	3.9	O K
4320 min Winter	8.561	0.061	0.0	2.4	2.4	3.2	O K
5760 min Winter	8.554	0.054	0.0	1.9	1.9	2.9	O K
7200 min Winter	8.549	0.049	0.0	1.6	1.6	2.6	O K
8640 min Winter	8.545	0.045	0.0	1.4	1.4	2.4	O K
10080 min Winter	8.543	0.043	0.0	1.3	1.3	2.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	78.003	0.0	68.2	34
60 min Winter	49.937	0.0	87.4	56
120 min Winter	30.882	0.0	108.1	94
180 min Winter	22.977	0.0	120.6	128
240 min Winter	18.500	0.0	129.5	160
360 min Winter	13.580	0.0	142.6	216
480 min Winter	10.904	0.0	152.6	266
600 min Winter	9.189	0.0	160.8	316
720 min Winter	7.986	0.0	167.7	376
960 min Winter	6.394	0.0	179.0	494
1440 min Winter	4.665	0.0	195.9	736
2160 min Winter	3.397	0.0	214.0	1100
2880 min Winter	2.709	0.0	227.5	1468
4320 min Winter	1.965	0.0	247.6	2200
5760 min Winter	1.563	0.0	262.6	2936
7200 min Winter	1.308	0.0	274.6	3672
8640 min Winter	1.131	0.0	285.0	4256
10080 min Winter	1.001	0.0	294.2	5024

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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)	19.000	Shortest Storm (mins)	15
Ratio R	0.355	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.175

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0	4 0.058	4	8 0.058	8	12 0.058

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 8.500 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	56.0	56.0	1.100	0.0	116.0
1.000	56.0	116.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0161-1330-1300-1330
Design Head (m) 1.300
Design Flow (l/s) 13.3
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 161
Invert Level (m) 8.500
Minimum Outlet Pipe Diameter (mm) 225
Suggested Manhole Diameter (mm) 1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	13.3
Flush-Flo™	0.385	13.3
Kick-Flo®	0.846	10.9
Mean Flow over Head Range	-	11.5

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	5.8	1.200	12.8	3.000	19.8	7.000	29.7
0.200	12.4	1.400	13.8	3.500	21.3	7.500	30.7
0.300	13.2	1.600	14.7	4.000	22.7	8.000	31.7
0.400	13.3	1.800	15.5	4.500	24.0	8.500	32.6
0.500	13.2	2.000	16.3	5.000	25.3	9.000	33.5
0.600	12.9	2.200	17.1	5.500	26.4	9.500	34.4
0.800	11.5	2.400	17.8	6.000	27.6		
1.000	11.7	2.600	18.5	6.500	28.7		