

PRP					Page 0	
Catherine House Old Harborough Road Brixworth NN6 9BX			82659 1 in 100 year storm + 40%CC			
Date 27/07/2023 File 82659 - ATTENUATION POND...			Designed by NN Checked by MS			
Micro Drainage			Source Control 2020.1.3			
<u>Summary of Results for 100 year Return Period (+40%)</u>						
	Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
	15 min Summer	99.369	0.845	3.0	136.9	O K
	30 min Summer	99.542	1.018	3.1	178.9	O K
	60 min Summer	99.699	1.175	3.3	221.7	O K
	120 min Summer	99.837	1.313	3.4	262.9	O K
	180 min Summer	99.904	1.380	3.5	284.6	O K
	240 min Summer	99.945	1.421	3.5	298.1	O K
	360 min Summer	99.996	1.472	3.6	315.4	O K
	480 min Summer	100.024	1.500	3.6	325.5	O K
	600 min Summer	100.040	1.516	3.6	331.2	O K
	720 min Summer	100.049	1.525	3.6	334.1	O K
	960 min Summer	100.050	1.526	3.6	334.5	O K
	1440 min Summer	100.023	1.499	3.6	325.2	O K
	2160 min Summer	99.971	1.447	3.6	307.0	O K
	2880 min Summer	99.926	1.402	3.5	292.0	O K
	4320 min Summer	99.853	1.329	3.4	268.2	O K
	5760 min Summer	99.788	1.264	3.4	248.0	O K
	7200 min Summer	99.726	1.202	3.3	229.4	O K
	8640 min Summer	99.667	1.143	3.3	212.5	O K
	10080 min Summer	99.610	1.086	3.2	196.7	O K
	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
	15 min Summer	140.425	0.0	227.5	19	
	30 min Summer	92.166	0.0	245.5	34	
	60 min Summer	57.587	0.0	480.8	64	
	120 min Summer	34.732	0.0	497.9	124	
	180 min Summer	25.480	0.0	513.0	184	
	240 min Summer	20.325	0.0	522.9	242	
	360 min Summer	14.772	0.0	536.1	362	
	480 min Summer	11.770	0.0	544.5	482	
	600 min Summer	9.861	0.0	550.2	602	
	720 min Summer	8.530	0.0	554.0	722	
	960 min Summer	6.780	0.0	558.3	960	
	1440 min Summer	4.898	0.0	559.3	1242	
	2160 min Summer	3.532	0.0	1020.0	1620	
	2880 min Summer	2.798	0.0	1023.3	2020	
	4320 min Summer	2.012	0.0	1015.3	2852	
	5760 min Summer	1.591	0.0	1510.0	3688	
	7200 min Summer	1.325	0.0	1534.6	4472	
	8640 min Summer	1.141	0.0	1555.3	5280	
	10080 min Summer	1.005	0.0	1573.5	6056	
©1982-2020 Innovyze						

PRP

Page 1

Catherine House Old Harborough Road Brixworth NN6 9BX	82659 1 in 100 year storm + 40%CC	
Date 27/07/2023 File 82659 - ATTENUATION POND...	Designed by NN Checked by MS	
Micro Drainage		

Source Control 2020.1.3

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

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Winter	99.440	0.916	3.0	153.5	O K
30 min Winter	99.624	1.100	3.2	200.6	O K
60 min Winter	99.790	1.266	3.4	248.6	O K
120 min Winter	99.938	1.414	3.5	295.7	O K
180 min Winter	100.011	1.487	3.6	320.8	O K
240 min Winter	100.055	1.531	3.6	336.3	O K
360 min Winter	100.111	1.587	3.7	356.9	O K
480 min Winter	100.144	1.620	3.7	369.4	O K
600 min Winter	100.164	1.640	3.7	377.1	O K
720 min Winter	100.176	1.652	3.7	381.7	O K
960 min Winter	100.185	1.661	3.7	385.2	O K
1440 min Winter	100.170	1.646	3.7	379.3	O K
2160 min Winter	100.121	1.597	3.7	360.9	O K
2880 min Winter	100.069	1.545	3.6	341.6	O K
4320 min Winter	99.970	1.446	3.6	306.7	O K
5760 min Winter	99.881	1.357	3.5	277.2	O K
7200 min Winter	99.795	1.271	3.4	250.1	O K
8640 min Winter	99.713	1.189	3.3	225.5	O K
10080 min Winter	99.634	1.110	3.2	203.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	140.425	0.0	234.9	19
30 min Winter	92.166	0.0	253.4	34
60 min Winter	57.587	0.0	489.7	64
120 min Winter	34.732	0.0	516.9	122
180 min Winter	25.480	0.0	532.9	180
240 min Winter	20.325	0.0	542.8	240
360 min Winter	14.772	0.0	556.0	356
480 min Winter	11.770	0.0	564.2	474
600 min Winter	9.861	0.0	569.5	590
720 min Winter	8.530	0.0	573.0	702
960 min Winter	6.780	0.0	576.5	930
1440 min Winter	4.898	0.0	575.2	1356
2160 min Winter	3.532	0.0	1054.9	1708
2880 min Winter	2.798	0.0	1062.6	2164
4320 min Winter	2.012	0.0	1053.8	3072
5760 min Winter	1.591	0.0	1582.1	3976
7200 min Winter	1.325	0.0	1610.0	4824
8640 min Winter	1.141	0.0	1633.0	5624
10080 min Winter	1.005	0.0	1653.9	6456

©1982-2020 Innovyze

PRP		Page 2
Catherine House Old Harborborough Road Brixworth NN6 9BX	82659 1 in 100 year storm + 40%CC	
Date 27/07/2023 File 82659 - ATTENUATION POND...	Designed by NN Checked by MS	
Micro Drainage Source Control 2020.1.3		

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)	20.300	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.526

Time (mins)	Area
From:	To: (ha)
0	4 0.526

©1982-2020 Innovyze

PRP		Page 3
Catherine House Old Harborough Road Brixworth NN6 9BX	82659 1 in 100 year storm + 40%CC	
Date 27/07/2023 File 82659 - ATTENUATION POND...	Designed by NN Checked by MS	
Micro Drainage Source Control 2020.1.3		

Model Details

Storage is Online Cover Level (m) 100.500

Tank or Pond Structure

Invert Level (m) 98.524

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	105.0	1.982	464.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0078-4000-2355-4000
Design Head (m)	2.355
Design Flow (l/s)	4.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	78
Invert Level (m)	98.145
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.355	4.0	Kick-Flo®	0.698	2.3
Flush-Flo™	0.343	2.8	Mean Flow over Head Range	-	3.0

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	2.2	1.200	2.9	3.000	4.5	7.000	6.7
0.200	2.7	1.400	3.1	3.500	4.8	7.500	6.9
0.300	2.8	1.600	3.3	4.000	5.1	8.000	7.1
0.400	2.8	1.800	3.5	4.500	5.4	8.500	7.3
0.500	2.8	2.000	3.7	5.000	5.7	9.000	7.5
0.600	2.6	2.200	3.9	5.500	5.9	9.500	7.7
0.800	2.4	2.400	4.0	6.000	6.2		
1.000	2.7	2.600	4.2	6.500	6.4		

©1982-2020 Innovyze