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1 The Grove Felpham West Sussex PO22 7EY			Barfoots SW Design					
Date 09/03/2021 14:38 File FC2846 SW design Rev B ...			Designed by MH Checked by					
Micro Drainage			Source Control 2019.1					
Summary of Results for 100 year Return Period (+40%)								
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status	
15 min Summer	2.583	0.283	5.0	0.0	5.0	16.2	0 K	
30 min Summer	2.635	0.335	5.0	0.0	5.0	20.1	0 K	
60 min Summer	2.659	0.359	5.0	0.0	5.0	21.9	0 K	
120 min Summer	2.655	0.355	5.0	0.0	5.0	21.6	0 K	
180 min Summer	2.633	0.333	5.0	0.0	5.0	19.9	0 K	
240 min Summer	2.605	0.305	5.0	0.0	5.0	17.8	0 K	
360 min Summer	2.546	0.246	5.0	0.0	5.0	13.6	0 K	
480 min Summer	2.497	0.197	5.0	0.0	5.0	10.4	0 K	
600 min Summer	2.459	0.159	5.0	0.0	5.0	8.1	0 K	
720 min Summer	2.433	0.133	4.9	0.0	4.9	6.6	0 K	
960 min Summer	2.409	0.109	4.4	0.0	4.4	5.3	0 K	
1440 min Summer	2.388	0.088	3.3	0.0	3.3	4.2	0 K	
2160 min Summer	2.372	0.072	2.5	0.0	2.5	3.4	0 K	
2880 min Summer	2.363	0.063	2.0	0.0	2.0	2.9	0 K	
4320 min Summer	2.353	0.053	1.5	0.0	1.5	2.4	0 K	
5760 min Summer	2.346	0.046	1.2	0.0	1.2	2.1	0 K	
7200 min Summer	2.342	0.042	1.0	0.0	1.0	1.9	0 K	
8640 min Summer	2.339	0.039	0.9	0.0	0.9	1.8	0 K	
10080 min Summer	2.337	0.037	0.8	0.0	0.8	1.7	0 K	
15 min Winter	2.614	0.314	5.0	0.0	5.0	18.5	0 K	
30 min Winter	2.671	0.371	5.0	0.0	5.0	22.9	0 K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
15 min Summer	124.633	0.0	19.4	0.0	17			
30 min Summer	83.789	0.0	26.0	0.0	30			
60 min Summer	53.779	0.0	33.5	0.0	48			
120 min Summer	33.337	0.0	41.5	0.0	82			
180 min Summer	24.832	0.0	46.4	0.0	116			
240 min Summer	20.006	0.0	49.8	0.0	150			
360 min Summer	14.706	0.0	54.9	0.0	212			
480 min Summer	11.818	0.0	58.8	0.0	270			
600 min Summer	9.966	0.0	62.0	0.0	326			
720 min Summer	8.665	0.0	64.7	0.0	378			
960 min Summer	6.943	0.0	69.1	0.0	494			
1440 min Summer	5.071	0.0	75.7	0.0	736			
2160 min Summer	3.696	0.0	82.8	0.0	1100			
2880 min Summer	2.949	0.0	88.1	0.0	1468			
4320 min Summer	2.142	0.0	96.0	0.0	2200			
5760 min Summer	1.705	0.0	101.8	0.0	2936			
7200 min Summer	1.427	0.0	106.6	0.0	3600			
8640 min Summer	1.235	0.0	110.7	0.0	4392			
10080 min Summer	1.093	0.0	114.3	0.0	5032			
15 min Winter	124.633	0.0	21.7	0.0	17			
30 min Winter	83.789	0.0	29.2	0.0	30			
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Micro Drainage							
Summary of Results for 100 year Return Period (+40%)							
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
60 min Winter	2.696	0.396	5.0	0.0	5.0	24.9	0 K
120 min Winter	2.685	0.385	5.0	0.0	5.0	24.1	0 K
180 min Winter	2.652	0.352	5.0	0.0	5.0	21.4	0 K
240 min Winter	2.608	0.308	5.0	0.0	5.0	18.0	0 K
360 min Winter	2.515	0.215	5.0	0.0	5.0	11.6	0 K
480 min Winter	2.448	0.148	5.0	0.0	5.0	7.5	0 K
600 min Winter	2.417	0.117	4.7	0.0	4.7	5.8	0 K
720 min Winter	2.404	0.104	4.1	0.0	4.1	5.0	0 K
960 min Winter	2.388	0.088	3.4	0.0	3.4	4.2	0 K
1440 min Winter	2.372	0.072	2.5	0.0	2.5	3.4	0 K
2160 min Winter	2.360	0.060	1.8	0.0	1.8	2.8	0 K
2880 min Winter	2.353	0.053	1.5	0.0	1.5	2.4	0 K
4320 min Winter	2.344	0.044	1.1	0.0	1.1	2.0	0 K
5760 min Winter	2.339	0.039	0.8	0.0	0.8	1.8	0 K
7200 min Winter	2.335	0.035	0.7	0.0	0.7	1.6	0 K
8640 min Winter	2.333	0.033	0.6	0.0	0.6	1.5	0 K
10080 min Winter	2.331	0.031	0.5	0.0	0.5	1.4	0 K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)		
60 min Winter	53.779	0.0	37.5	0.0	50		
120 min Winter	33.337	0.0	46.5	0.0	88		
180 min Winter	24.832	0.0	51.9	0.0	126		
240 min Winter	20.006	0.0	55.8	0.0	162		
360 min Winter	14.706	0.0	61.5	0.0	222		
480 min Winter	11.818	0.0	65.9	0.0	272		
600 min Winter	9.966	0.0	69.5	0.0	320		
720 min Winter	8.665	0.0	72.5	0.0	378		
960 min Winter	6.943	0.0	77.4	0.0	492		
1440 min Winter	5.071	0.0	84.8	0.0	738		
2160 min Winter	3.696	0.0	92.7	0.0	1108		
2880 min Winter	2.949	0.0	98.7	0.0	1448		
4320 min Winter	2.142	0.0	107.5	0.0	2180		
5760 min Winter	1.705	0.0	114.1	0.0	2936		
7200 min Winter	1.427	0.0	119.4	0.0	3672		
8640 min Winter	1.235	0.0	124.0	0.0	4296		
10080 min Winter	1.093	0.0	128.0	0.0	5112		
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Micro Drainage Source Control 2019.1		

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

Time Area Diagram

Total Area (ha) 0.083

Time (mins)	Area
From:	To: (ha)
0	4 0.083

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Model Details

Storage is Online Cover Level (m) 3.100

Tank or Pond Structure

Invert Level (m) 2.300

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	44.0	0.700	120.0	1.400	0.0	2.100	0.0
0.100	53.0	0.701	0.0	1.500	0.0	2.200	0.0
0.200	63.0	0.900	0.0	1.600	0.0	2.300	0.0
0.300	73.0	1.000	0.0	1.700	0.0	2.400	0.0
0.400	84.0	1.100	0.0	1.800	0.0	2.500	0.0
0.500	95.0	1.200	0.0	1.900	0.0		
0.600	107.0	1.300	0.0	2.000	0.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0114-5000-0400-5000
Design Head (m)	0.400
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	114
Invert Level (m)	2.300
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	5.0
Flush-Flo™	0.169	5.0
Kick-Flo®	0.312	4.5
Mean Flow over Head Range	-	4.0

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	4.0	1.200	8.3	3.000	12.9	7.000	19.5
0.200	5.0	1.400	9.0	3.500	13.9	7.500	20.2
0.300	4.6	1.600	9.6	4.000	14.8	8.000	20.9
0.400	5.0	1.800	10.1	4.500	15.6	8.500	21.5
0.500	5.5	2.000	10.6	5.000	16.4	9.000	22.1
0.600	6.0	2.200	11.1	5.500	17.3	9.500	22.7
0.800	6.9	2.400	11.6	6.000	18.0		
1.000	7.7	2.600	12.0	6.500	18.8		

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<u>Pipe Overflow Control</u> Diameter (m) 0.150 Entry Loss Coefficient 0.500 Slope (1:X) 100.0 Coefficient of Contraction 0.600 Length (m) 2.000 Upstream Invert Level (m) 2.700 Roughness k (mm) 0.600		
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