

Andrew Gough Development Consultant		Page 1
9 Joyce Way Whitchurch Shropshire SY13 1TZ	1 in 100 + 35% Simulation Phase 2 Penley	
Date 04/12/2019 14:18 File 1 in 1 year base design...	Designed by Owner Checked by	
Micro Drainage		Network 2017.1.2

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	7.473	0.094	79.5	0.034	2.00	0.600	o	150	Pipe/Conduit
2.000	8.978	0.127	70.7	0.059	2.00	0.600	o	150	Pipe/Conduit
3.000	9.452	0.296	31.9	0.033	2.00	0.600	o	150	Pipe/Conduit
1.001	13.499	0.443	30.5	0.000	0.00	0.600	o	150	Pipe/Conduit
1.002	8.033	0.100	80.3	0.000	0.00	0.600	o	150	Pipe/Conduit
1.003	27.716	0.214	129.5	0.000	0.00	0.600	o	150	Pipe/Conduit
1.004	7.017	0.047	149.3	0.000	0.00	0.600	o	150	Pipe/Conduit

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
1.000	1	65.657	64.268	1.239	65.424	64.174	1.100		900
2.000	2	65.344	64.301	0.893	65.424	64.174	1.100		900
3.000	3	65.851	64.470	1.231	65.424	64.174	1.100		900
1.001	4	65.424	64.174	1.100	65.750	63.731	1.869		1200
1.002	5	65.750	63.731	1.869	65.786	63.631	2.005	Hydro-Brake®	3000
1.003	6	65.786	63.631	2.005	64.500	63.417	0.933		1200
1.004	7	64.500	63.417	0.933	64.475	63.370	0.955		1200

Andrew Gough Development Consultant		Page 2
9 Joyce Way Whitchurch Shropshire SY13 1TZ	1 in 100 + 35% Simulation Phase 2 Penley	
Date 04/12/2019 14:18 File 1 in 1 year base design...	Designed by Owner Checked by	
Micro Drainage	Network 2017.1.2	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	65.657	1.389	Open Manhole	900	1.000	64.268	150				
2	65.344	1.043	Open Manhole	900	2.000	64.301	150				
3	65.851	1.381	Open Manhole	900	3.000	64.470	150				
4	65.424	1.250	Open Manhole	1200	1.001	64.174	150	1.000	64.174	150	
								2.000	64.174	150	
								3.000	64.174	150	
5	65.750	2.019	Open Manhole	3000	1.002	63.731	150	1.001	63.731	150	
6	65.786	2.155	Open Manhole	1200	1.003	63.631	150	1.002	63.631	150	
7	64.500	1.083	Open Manhole	1200	1.004	63.417	150	1.003	63.417	150	
	64.475	1.105	Open Manhole	0		OUTFALL		1.004	63.370	150	

Andrew Gough Development Consultant		Page 3
9 Joyce Way Whitchurch Shropshire SY13 1TZ	1 in 100 + 35% Simulation Phase 2 Penley	
Date 04/12/2019 14:18 File 1 in 1 year base design...	Designed by Owner Checked by	
Micro Drainage	Network 2017.1.2	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	o	150	1	65.657	64.268	1.239	Open Manhole		900
2.000	o	150	2	65.344	64.301	0.893	Open Manhole		900
3.000	o	150	3	65.851	64.470	1.231	Open Manhole		900
1.001	o	150	4	65.424	64.174	1.100	Open Manhole		1200
1.002	o	150	5	65.750	63.731	1.869	Open Manhole		3000
1.003	o	150	6	65.786	63.631	2.005	Open Manhole		1200
1.004	o	150	7	64.500	63.417	0.933	Open Manhole		1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	7.473	79.5	4	65.424	64.174	1.100	Open Manhole		1200
2.000	8.978	70.7	4	65.424	64.174	1.100	Open Manhole		1200
3.000	9.452	31.9	4	65.424	64.174	1.100	Open Manhole		1200
1.001	13.499	30.5	5	65.750	63.731	1.869	Open Manhole		3000
1.002	8.033	80.3	6	65.786	63.631	2.005	Open Manhole		1200
1.003	27.716	129.5	7	64.500	63.417	0.933	Open Manhole		1200
1.004	7.017	149.3		64.475	63.370	0.955	Open Manhole		0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.004		64.475	63.370	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	1	Number of Storage Structures	1

Andrew Gough Development Consultant		Page 4
9 Joyce Way Whitchurch Shropshire SY13 1TZ	1 in 100 + 35% Simulation Phase 2 Penley	
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Simulation Criteria for Storm

Number of Time/Area Diagrams 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.400		

Andrew Gough Development Consultant		Page 5
9 Joyce Way Whitchurch Shropshire SY13 1TZ	1 in 100 + 35% Simulation Phase 2 Penley	
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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 5, DS/PN: 1.002, Volume (m³): 14.5

Unit Reference	MD-SHE-0078-3200-1500-3200
Design Head (m)	1.500
Design Flow (l/s)	3.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	78
Invert Level (m)	63.731
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	3.2
Flush-Flo™	0.343	2.8
Kick-Flo®	0.697	2.3
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	2.2	1.200	2.9	3.000	4.4	7.000	6.6
0.200	2.7	1.400	3.1	3.500	4.7	7.500	6.8
0.300	2.8	1.600	3.3	4.000	5.0	8.000	7.0
0.400	2.8	1.800	3.5	4.500	5.3	8.500	7.2
0.500	2.7	2.000	3.7	5.000	5.6	9.000	7.4
0.600	2.6	2.200	3.8	5.500	5.9	9.500	7.6
0.800	2.4	2.400	4.0	6.000	6.1		
1.000	2.7	2.600	4.1	6.500	6.3		

Andrew Gough Development Consultant		Page 6
9 Joyce Way Whitchurch Shropshire SY13 1TZ	1 in 100 + 35% Simulation Phase 2 Penley	
Date 04/12/2019 14:18 File 1 in 1 year base design...	Designed by Owner Checked by	
Micro Drainage	Network 2017.1.2	

Storage Structures for Storm

Tank or Pond Manhole: 4, DS/PN: 1.001

Invert Level (m) 64.174

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	59.6	0.700	262.4	1.400	0.0	2.100	0.0
0.100	81.8	0.800	300.5	1.500	0.0	2.200	0.0
0.200	106.2	0.900	340.8	1.600	0.0	2.300	0.0
0.300	132.9	1.000	383.3	1.700	0.0	2.400	0.0
0.400	161.9	1.100	428.6	1.800	0.0	2.500	0.0
0.500	193.2	1.200	475.2	1.900	0.0		
0.600	226.7	1.300	524.6	2.000	0.0		

