

Andrew Gough Development Consultant		Page 2
9 Joyce Way Whitchurch Shropshire SY13 1TZ	Penley 2 1 in 100 + 35% Simulation	
Date 28/08/2019 File 1 in 100 + 35% Simulati...	Designed by ag Checked by	
Micro Drainage	Network 2018.1.1	

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., L*W (mm)
1.000	o	225	1	65.150	64.081	0.844	Open Manhole	1200
1.001	o	225	2	65.300	64.028	1.047	Open Manhole	1200
1.002	o	225	3	65.350	63.956	1.169	Open Manhole	1200
2.000	o	225	4	65.850	63.983	1.642	Open Manhole	1200
1.003	o	225	5	65.500	63.880	1.395	Open Manhole	1200
1.004	o	150	6	65.500	63.839	1.511	Open Manhole	3000
1.005	o	150	7	65.375	63.755	1.470	Open Manhole	1200
1.006	o	150	8	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., L*W (mm)
1.000	8.000	150.9	2	65.300	64.028	1.047	Open Manhole	1200
1.001	10.617	147.5	3	65.350	63.956	1.169	Open Manhole	1200
1.002	9.279	122.1	5	65.500	63.880	1.395	Open Manhole	1200
2.000	13.300	129.1	5	65.500	63.880	1.395	Open Manhole	1200
1.003	5.306	129.4	6	65.500	63.839	1.436	Open Manhole	3000
1.004	10.917	130.0	7	65.375	63.755	1.470	Open Manhole	1200
1.005	42.900	126.9	8	64.500	63.417	0.933	Open Manhole	1200
1.006	7.000	148.9		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)
1.006		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 3
9 Joyce Way Whitchurch Shropshire SY13 1TZ	Penley 2 1 in 100 + 35% Simulation	
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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	0.313		

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

Hydro-Brake® Optimum Manhole: 6, DS/PN: 1.004, Volume (m³): 11.9

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)	63.839
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 5
9 Joyce Way Whitchurch Shropshire SY13 1TZ	Penley 2 1 in 100 + 35% Simulation	
Date 28/08/2019 File 1 in 100 + 35% Simulati...	Designed by ag Checked by	
Micro Drainage	Network 2018.1.1	

Storage Structures for Storm

Tank or Pond Manhole: 5, DS/PN: 1.003

Invert Level (m) 63.880

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	66.0	0.700	158.7	1.400	251.1	2.100	0.0
0.100	79.2	0.800	172.0	1.500	264.7	2.200	0.0
0.200	92.5	0.900	185.2	1.600	278.0	2.300	0.0
0.300	105.7	1.000	198.5	1.700	0.0	2.400	0.0
0.400	119.0	1.100	211.7	1.800	0.0	2.500	0.0
0.500	132.5	1.200	225.0	1.900	0.0		
0.600	144.5	1.300	238.2	2.000	0.0		

Andrew Gough Development Consultant		Page 6	
9 Joyce Way Whitchurch Shropshire SY13 1TZ		Penley 2 1 in 100 + 35% Simulation	
Date 28/08/2019		Designed by ag	
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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.313
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	OFF		

Profile(s)

Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	35, 35, 35

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	480 Winter	100	+35%	30/30 Summer				64.796
1.001	2	480 Winter	100	+35%	30/15 Winter				64.796
1.002	3	480 Winter	100	+35%	30/15 Summer				64.796
2.000	4	480 Winter	100	+35%	30/15 Summer				64.798
1.003	5	480 Winter	100	+35%	1/60 Winter				64.795
1.004	6	360 Winter	100	+35%	1/15 Summer				64.784
1.005	7	240 Winter	1	+35%					63.798
1.006	8	240 Winter	1	+35%					63.465

Surcharged Flooded					Pipe		Level
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status Exceeded
1.000	1	0.490	0.000	0.05		1.6	SURCHARGED
1.001	2	0.543	0.000	0.06		2.1	SURCHARGED
1.002	3	0.615	0.000	0.09		3.4	SURCHARGED
2.000	4	0.590	0.000	0.26		10.3	SURCHARGED
1.003	5	0.690	0.000	0.12		3.7	SURCHARGED
1.004	6	0.795	0.000	0.20		2.8	SURCHARGED
1.005	7	-0.107	0.000	0.18		2.8	OK

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Andrew Gough Development Consultant		Page 7
9 Joyce Way Whitchurch Shropshire SY13 1TZ	Penley 2 1 in 100 + 35% Simulation	
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PN	US/MH Name	Surcharged Flooded		Pipe		Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Overflow Cap. (1/s)	Flow (1/s)		
1.006	8	-0.102	0.000	0.22	2.8	OK	