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9 Joyce Way Whitchurch Shropshire SY13 1TZ	1 in 1 Year Base Design Phase 2 Penley	
Date 04/12/2019 14:16 File 1 in 1 year base design...	Designed by Owner Checked by	
Micro Drainage	Network 2017.1.2	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time Area
(mins) (ha)

0-4 0.126

Total Area Contributing (ha) = 0.126

Total Pipe Volume (m³) = 1.452

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	7.473	0.094	79.5	0.034	2.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	8.978	0.127	70.7	0.059	2.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	9.452	0.296	31.9	0.033	2.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	13.499	0.443	30.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	2.11	64.268	0.034	0.0	0.0	0.0	1.13	19.9	4.6
2.000	50.00	2.12	64.301	0.059	0.0	0.0	0.0	1.20	21.2	8.0
3.000	50.00	2.09	64.470	0.033	0.0	0.0	0.0	1.79	31.6	4.5
1.001	50.00	2.12	64.174	0.000	3.2	0.0	0.0	1.83	32.3	3.2

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PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.002	8.033	0.100	80.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.003	27.716	0.214	129.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	7.017	0.047	149.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.002	50.00	2.24	63.731	0.000	3.2	0.0	0.0	1.12	19.8	3.2
1.003	50.00	2.77	63.631	0.000	3.2	0.0	0.0	0.88	15.6	3.2
1.004	50.00	2.91	63.417	0.000	3.2	0.0	0.0	0.82	14.5	3.2

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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	

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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	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., L*W (mm)
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