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9 Joyce Way Whitchurch Shropshire SY13 1TZ	Willington Grange 1 in 1 year nase design	
Date 01.09.14 File 1 in 1 year base...	Designed by ag Checked by	
Micro Drainage		Network W.12.6.1

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)	1	Add Flow / Climate Change (%)	0
M5-60 (mm)	18.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.363	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	100	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500
PIMP (%)	100		

Designed with Level Soffits

Time Area Diagram for Storm

Time Area
(mins) (ha)

0-4 0.033

Total Area Contributing (ha) = 0.033

Total Pipe Volume (m³) = 5.294

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)
1.000	14.000	0.035	400.0	0.011	2.00	0.0	0.600	o	450
2.000	19.000	0.047	404.3	0.022	2.00	0.0	0.600	o	450
1.001	2.577	0.032	80.5	0.000	0.00	0.0	0.600	o	150

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	61.86	2.23	97.913	0.011	0.0	0.0	0.0	1.01	160.7	1.8
2.000	61.25	2.32	97.925	0.022	0.0	0.0	0.0	1.00	159.8	3.6
1.001	63.30	2.04	97.878	0.000	5.0	0.0	0.0	1.12	19.8	5.0

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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	450	1	98.950	97.913	0.587	Open Manhole	900
2.000	o	450	2	98.875	97.925	0.500	Open Manhole	900
1.001	o	150	3	98.850	97.878	0.822	Open Manhole	900

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	14.000	400.0	3	98.850	97.878	0.522	Open Manhole	900
2.000	19.000	404.3	3	98.850	97.878	0.522	Open Manhole	900
1.001	2.577	80.5		98.850	97.846	0.854	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)
1.001		98.850	97.846	0.000	0	0