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9 Joyce Way Whitchurch Shropshire SY13 1TZ	1 in 100 + 30% Simulation Highway Drainage	
Date 18.04.17 File 1 in 100 + 30% Simulati...	Designed by ag Checked by	
Micro Drainage	Network 2015.1	

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	18.237	16.812	1.200	Open Manhole	1200
1.001	oo	44	2	16.747	15.063	1.159	Open Manhole	1200
1.002	o	150	3	16.936	14.998	1.788	Open Manhole	1200
1.003	o	150	4	16.800	14.941	1.709	Open Manhole	1200
1.004	o	150	5	15.950	14.525	1.275	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	33.071	22.8	2	16.747	15.363	1.159	Open Manhole	1200
1.001	26.000	400.0	3	16.936	14.998	1.413	Open Manhole	1200
1.002	11.333	198.8	4	16.800	14.941	1.709	Open Manhole	1200
1.003	32.569	78.3	5	15.950	14.525	1.275	Open Manhole	1200
1.004	5.088	29.1		15.850	14.350	1.350	Open Manhole	1200

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		15.850	14.350	0.000	1200	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /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 Storage Structures	0
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	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	0.392		

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Online Controls for Storm

Hydro-Brake Optimum® Manhole: 3, DS/PN: 1.002, Volume (m³): 12.9

Unit Reference MD-SHE-0111-5000-0600-5000
Design Head (m) 0.600
Design Flow (l/s) 5.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 111
Invert Level (m) 14.998
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.600	5.0
Flush-Flo™	0.193	5.0
Kick-Flo®	0.428	4.3
Mean Flow over Head Range	–	4.2

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	3.9	1.200	6.9	3.000	10.6	7.000	15.9
0.200	5.0	1.400	7.4	3.500	11.4	7.500	16.5
0.300	4.9	1.600	7.9	4.000	12.2	8.000	17.0
0.400	4.5	1.800	8.4	4.500	12.9	8.500	17.6
0.500	4.6	2.000	8.8	5.000	13.6	9.000	18.1
0.600	5.0	2.200	9.2	5.500	14.2	9.500	18.6
0.800	5.7	2.400	9.6	6.000	14.8		
1.000	6.3	2.600	9.9	6.500	15.3		

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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 Coeffiecient 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 0
 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 0.392
 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) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 30, 30, 30

	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level
1.000	1	15 Summer	100	+30%					16.875
1.001	2	30 Winter	100	+30%	100/30 Winter				15.598
1.002	3	30 Winter	100	+30%	1/15 Winter				15.597
1.003	4	30 Winter	100	+30%					14.993
1.004	5	30 Winter	100	+30%					14.569

	US/MH	Depth	Volume	Flow / Overflow	Pipe		Level
PN	Name	(m)	(m³)	Cap. (l/s)	Flow (l/s)	Status	Exceeded
1.000	1	-0.162	0.000	0.17	17.9	OK	
1.001	2	0.010	0.000	0.06	24.4	SURCHARGED	
1.002	3	0.449	0.000	0.44	5.0	SURCHARGED	
1.003	4	-0.098	0.000	0.26	5.0	OK	
1.004	5	-0.106	0.000	0.19	5.0	OK	