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20 East Sands	19700	
Burbage Marlborough	Hullavington	
Wiltshire SN8 3AN	SW NT1	
Date 25/02/2025	Designed by SMR	
File SW S104 V5.MDX	Checked by PS	
Micro Drainage	Network 2018.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes UKPartH Manhole Sizes UKPartH

FEH Rainfall Model	
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 389650 182600 ST 89650 82600
Data Type	Catchment
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	10
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

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	1.913	0.800	2.4	0.046	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	5.535	0.060	92.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	19.080	0.320	59.6	0.036	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	17.345	0.200	86.7	0.040	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	33.780	0.200	168.9	0.048	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	78.527	3.665	21.4	0.150	0.00	0.0	0.600	o	225	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	5.00	97.400	0.046	0.0	0.0	0.6	6.57	116.1	6.9
1.001	50.00	5.09	96.600	0.046	0.0	0.0	0.6	1.05	18.5	6.9
2.000	50.00	5.19	96.790	0.036	0.0	0.0	0.5	1.70	67.5	5.4
1.002	50.00	5.39	96.470	0.122	0.0	0.0	1.7	1.40	55.9	18.2
1.003	50.00	5.95	96.270	0.170	0.0	0.0	2.3	1.00	39.9	25.3
1.004	50.00	6.42	96.070	0.320	0.0	0.0	4.3	2.84	112.9	47.7

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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
3.000	56.266	1.675	33.6	0.049	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	10.405	0.135	77.1	0.135	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.002	39.001	0.490	79.6	0.116	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.003	30.197	0.520	58.1	0.109	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.004	6.653	0.400	16.6	0.010	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	16.373	0.410	39.9	0.146	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	34.424	0.880	39.1	0.060	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	30.729	2.060	14.9	0.038	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	54.721	3.690	14.8	0.175	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.001	12.554	0.390	32.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	26.580	0.385	69.0	0.066	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	15.190	0.260	58.4	0.089	5.00	0.0	0.600	o	150	Pipe/Conduit	
4.003	47.886	1.240	38.6	0.089	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.004	5.511	1.470	3.7	0.051	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	57.208	0.680	84.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	24.787	0.220	112.7	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)
3.000	50.00	5.54	95.700	0.049	0.0	0.0	0.7	1.74	30.8	7.3
3.001	50.00	5.65	93.950	0.184	0.0	0.0	2.5	1.49	59.3	27.4
3.002	50.00	6.02	93.740	0.300	0.0	0.0	4.1	1.76	124.7	44.7
3.003	50.00	6.27	93.250	0.409	0.0	0.0	5.5	2.07	146.1	60.9
3.004	50.00	6.29	92.730	0.419	0.0	0.0	5.7	3.87	273.8	62.4
1.005	50.00	6.52	92.330	0.885	0.0	0.0	12.0	2.50	176.4	131.8
1.006	49.55	6.75	91.920	0.945	0.0	0.0	12.7	2.52	178.2	139.5
1.007	49.12	6.88	91.040	0.983	0.0	0.0	13.1	4.09	289.2	143.9
4.000	50.00	5.27	96.230	0.175	0.0	0.0	2.4	3.42	135.8	26.1
4.001	50.00	5.36	92.540	0.175	0.0	0.0	2.4	2.31	92.0	26.1
4.002	50.00	5.64	92.150	0.241	0.0	0.0	3.3	1.58	62.7	35.9
5.000	50.00	5.19	92.100	0.089	0.0	0.0	1.2	1.32	23.3	13.3
4.003	50.00	5.95	91.690	0.419	0.0	0.0	5.7	2.54	179.4	62.4
4.004	50.00	5.96	90.450	0.470	0.0	0.0	6.4	8.17	577.8	70.0
1.008	47.71	7.31	88.830	1.453	0.0	0.0	18.8	2.22	352.7	206.5
1.009	46.36	7.74	88.050	1.453	0.0	0.0	18.8	0.95	16.7«	206.5

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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)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	98.000	0.600	Open Manhole	1200	1.000	97.400	150				
2	98.000	1.400	Open Manhole	1200	1.001	96.600	150	1.000	96.600	150	
3	97.680	0.890	Open Manhole	900 x 675	2.000	96.790	225				
4	97.900	1.430	Open Manhole	1350	1.002	96.470	225	1.001	96.540	150	
								2.000	96.470	225	
5	97.850	1.580	Open Manhole	1350	1.003	96.270	225	1.002	96.270	225	
6	97.500	1.430	Open Manhole	1350	1.004	96.070	225	1.003	96.070	225	
7	97.050	1.350	Open Manhole	1350	3.000	95.700	150				
8	95.380	1.430	Open Manhole	1350	3.001	93.950	225	3.000	94.025	150	
9	95.240	1.500	Open Manhole	1350	3.002	93.740	300	3.001	93.815	225	
10	94.750	1.500	Open Manhole	1350	3.003	93.250	300	3.002	93.250	300	
11	94.230	1.500	Open Manhole	1350	3.004	92.730	300	3.003	92.730	300	
12	94.350	2.020	Open Manhole	1500	1.005	92.330	300	1.004	92.405	225	
								3.004	92.330	300	
13	94.000	2.080	Open Manhole	1200	1.006	91.920	300	1.005	91.920	300	
14	93.000	1.960	Open Manhole	1200	1.007	91.040	300	1.006	91.040	300	
15	97.660	1.430	Open Manhole	1350	4.000	96.230	225				
16	94.740	2.200	Open Manhole	1200	4.001	92.540	225	4.000	92.540	225	
17	94.060	1.910	Open Manhole	1200	4.002	92.150	225	4.001	92.150	225	
18	93.450	1.350	Open Manhole	1350	5.000	92.100	150				
19	93.190	1.500	Open Manhole	1350	4.003	91.690	300	4.002	91.765	225	
								5.000	91.840	150	
20	91.950	1.500	Open Manhole	1350	4.004	90.450	300	4.003	90.450	300	
21	91.950	3.120	Open Manhole	1500	1.008	88.830	450	1.007	88.980	300	
								4.004	88.980	300	
22	90.100	2.050	Open Manhole	1850	1.009	88.050	150	1.008	88.150	450	400
	88.300	0.470	Open Manhole	0		OUTFALL		1.009	87.830	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	98.000	97.400	0.450	Open Manhole	1200
1.001	o	150	2	98.000	96.600	1.250	Open Manhole	1200
2.000	o	225	3	97.680	96.790	0.665	Open Manhole	900 x 675
1.002	o	225	4	97.900	96.470	1.205	Open Manhole	1350
1.003	o	225	5	97.850	96.270	1.355	Open Manhole	1350
1.004	o	225	6	97.500	96.070	1.205	Open Manhole	1350
3.000	o	150	7	97.050	95.700	1.200	Open Manhole	1350
3.001	o	225	8	95.380	93.950	1.205	Open Manhole	1350
3.002	o	300	9	95.240	93.740	1.200	Open Manhole	1350
3.003	o	300	10	94.750	93.250	1.200	Open Manhole	1350
3.004	o	300	11	94.230	92.730	1.200	Open Manhole	1350
1.005	o	300	12	94.350	92.330	1.720	Open Manhole	1500
1.006	o	300	13	94.000	91.920	1.780	Open Manhole	1200
1.007	o	300	14	93.000	91.040	1.660	Open Manhole	1200
4.000	o	225	15	97.660	96.230	1.205	Open Manhole	1350
4.001	o	225	16	94.740	92.540	1.975	Open Manhole	1200
4.002	o	225	17	94.060	92.150	1.685	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	1.913	2.4	2	98.000	96.600	1.250	Open Manhole	1200
1.001	5.535	92.3	4	97.900	96.540	1.210	Open Manhole	1350
2.000	19.080	59.6	4	97.900	96.470	1.205	Open Manhole	1350
1.002	17.345	86.7	5	97.850	96.270	1.355	Open Manhole	1350
1.003	33.780	168.9	6	97.500	96.070	1.205	Open Manhole	1350
1.004	78.527	21.4	12	94.350	92.405	1.720	Open Manhole	1500
3.000	56.266	33.6	8	95.380	94.025	1.205	Open Manhole	1350
3.001	10.405	77.1	9	95.240	93.815	1.200	Open Manhole	1350
3.002	39.001	79.6	10	94.750	93.250	1.200	Open Manhole	1350
3.003	30.197	58.1	11	94.230	92.730	1.200	Open Manhole	1350
3.004	6.653	16.6	12	94.350	92.330	1.720	Open Manhole	1500
1.005	16.373	39.9	13	94.000	91.920	1.780	Open Manhole	1200
1.006	34.424	39.1	14	93.000	91.040	1.660	Open Manhole	1200
1.007	30.729	14.9	21	91.950	88.980	2.670	Open Manhole	1500
4.000	54.721	14.8	16	94.740	92.540	1.975	Open Manhole	1200
4.001	12.554	32.2	17	94.060	92.150	1.685	Open Manhole	1200
4.002	26.580	69.0	19	93.190	91.765	1.200	Open Manhole	1350

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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)
5.000	o	150	18	93.450	92.100	1.200	Open Manhole	1350
4.003	o	300	19	93.190	91.690	1.200	Open Manhole	1350
4.004	o	300	20	91.950	90.450	1.200	Open Manhole	1350
1.008	o	450	21	91.950	88.830	2.670	Open Manhole	1500
1.009	o	150	22	90.100	88.050	1.900	Open Manhole	1850

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)
5.000	15.190	58.4	19	93.190	91.840	1.200	Open Manhole	1350
4.003	47.886	38.6	20	91.950	90.450	1.200	Open Manhole	1350
4.004	5.511	3.7	21	91.950	88.980	2.670	Open Manhole	1500
1.008	57.208	84.1	22	90.100	88.150	1.500	Open Manhole	1850
1.009	24.787	112.7		88.300	87.830	0.320	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)
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1.009		88.300	87.830	87.830	0	0
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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 Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Site Location GB 389650 182600 ST 89650 82600
Return Period (years) 2 Data Type Catchment
FEH Rainfall Version 2013 Summer Storms Yes

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Synthetic Rainfall Details

Winter Storms No Cv (Winter) 0.840
Cv (Summer) 0.750 Storm Duration (mins) 30

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Online Controls for Storm

Orifice Manhole: 2, DS/PN: 1.001, Volume (m³): 1.6

Diameter (m) 0.020 Discharge Coefficient 0.600 Invert Level (m) 96.600

Hydro-Brake® Optimum Manhole: 22, DS/PN: 1.009, Volume (m³): 14.3

Unit Reference	MD-SHE-0089-3900-1300-3900
Design Head (m)	1.300
Design Flow (l/s)	3.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	89
Invert Level (m)	88.050
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	3.9	Kick-Flo®	0.799	3.1
Flush-Flo™	0.392	3.9	Mean Flow over Head Range	-	3.4

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)	Depth (m)	Flow (l/s)
0.100	2.8	0.800	3.1	2.000	4.8	4.000	6.6	7.000	8.6
0.200	3.6	1.000	3.4	2.200	5.0	4.500	7.0	7.500	8.9
0.300	3.8	1.200	3.8	2.400	5.2	5.000	7.3	8.000	9.1
0.400	3.9	1.400	4.0	2.600	5.4	5.500	7.6	8.500	9.4
0.500	3.8	1.600	4.3	3.000	5.7	6.000	8.0	9.000	9.7
0.600	3.7	1.800	4.5	3.500	6.2	6.500	8.3	9.500	9.9

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Storage Structures for Storm

Porous Car Park Manhole: 2, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	18.2
Membrane Percolation (mm/hr)	1000	Length (m)	25.0
Max Percolation (l/s)	126.4	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	97.400	Cap Volume Depth (m)	0.370

Tank or Pond Manhole: 22, DS/PN: 1.009

Invert Level (m) 88.050

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	819.0	1.050	1002.0	1.051	1101.0	1.700	1218.0	1.701	0.0

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2 year Return Period 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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 389650 182600 ST 89650 82600 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status OFF
 Inertia 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) 2, 30, 100
 Climate Change (%) 0, 0, 40

										Water	Surcharged	
US/MH				Return	Climate	First (X)		First (Y)	First (Z)	Overflow	Level	
PN	Name	Storm		Period	Change	Surcharge		Flood	Overflow	Act.	(m)	Depth
1.000	1	15 Winter		2	+0%	100/15	Summer				97.434	-0.116
1.001	2	120 Winter		2	+0%	2/15	Summer				97.418	0.668
2.000	3	15 Winter		2	+0%	100/15	Summer	100/15	Summer		96.834	-0.181
1.002	4	15 Winter		2	+0%	100/15	Summer				96.541	-0.154
1.003	5	15 Winter		2	+0%	30/15	Summer				96.376	-0.119
1.004	6	15 Winter		2	+0%	100/15	Summer	100/15	Summer		96.157	-0.138
3.000	7	15 Winter		2	+0%	100/15	Summer				95.749	-0.101
3.001	8	15 Winter		2	+0%	30/15	Summer	100/15	Summer		94.060	-0.115
3.002	9	15 Winter		2	+0%	30/15	Summer	100/15	Summer		93.859	-0.181
3.003	10	15 Winter		2	+0%	30/15	Summer	100/15	Summer		93.379	-0.171
3.004	11	15 Winter		2	+0%	30/15	Summer	100/15	Summer		92.848	-0.182
1.005	12	15 Winter		2	+0%	30/15	Summer				92.515	-0.115
1.006	13	15 Winter		2	+0%	30/15	Summer				92.102	-0.118
1.007	14	15 Winter		2	+0%	100/15	Summer				91.179	-0.161
4.000	15	15 Winter		2	+0%	100/15	Summer				96.297	-0.158
4.001	16	15 Winter		2	+0%	30/15	Summer				92.628	-0.137
4.002	17	15 Winter		2	+0%	30/15	Summer	100/15	Summer		92.274	-0.101
5.000	18	15 Winter		2	+0%	30/15	Summer	100/15	Summer		92.184	-0.066
4.003	19	15 Winter		2	+0%	100/15	Summer				91.811	-0.179
4.004	20	15 Winter		2	+0%	100/15	Summer				90.542	-0.208
1.008	21	15 Winter		2	+0%	30/15	Summer				89.069	-0.211
1.009	22	960 Winter		2	+0%	2/60	Summer				88.401	0.201

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Micro Drainage	Network 2018.1	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Flow (l/s)			
1.000	1	0.000	0.12	6.7	OK		
1.001	2	0.000	0.05	0.8	SURCHARGED		
2.000	3	0.000	0.09	5.2	OK		4
1.002	4	0.000	0.22	10.8	OK		
1.003	5	0.000	0.44	16.6	OK		
1.004	6	0.000	0.31	34.6	OK		3
3.000	7	0.000	0.23	7.0	OK		
3.001	8	0.000	0.47	23.4	OK		5
3.002	9	0.000	0.33	37.7	OK		3
3.003	10	0.000	0.38	51.0	OK		5
3.004	11	0.000	0.33	52.3	OK		6
1.005	12	0.000	0.70	104.2	OK		
1.006	13	0.000	0.68	111.0	OK		
1.007	14	0.000	0.44	114.9	OK		
4.000	15	0.000	0.19	25.2	OK		
4.001	16	0.000	0.32	25.0	OK		
4.002	17	0.000	0.57	33.3	OK		2
5.000	18	0.000	0.60	12.9	OK		2
4.003	19	0.000	0.34	56.9	OK		
4.004	20	0.000	0.21	63.0	OK		
1.008	21	0.000	0.55	178.1	OK		
1.009	22	0.000	0.24	3.9	SURCHARGED		

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30 year Return Period 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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 389650 182600 ST 89650 82600 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status OFF
 Inertia 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) 2, 30, 100
 Climate Change (%) 0, 0, 40

					Water Surcharged	
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) First (Y) First (Z) Overflow Level	Depth
					Surcharge Flood Overflow Act. (m)	(m)
1.000	1	15 Winter	30	+0%	100/15 Summer	97.477 -0.073
1.001	2	120 Winter	30	+0%	2/15 Summer	97.463 0.713
2.000	3	15 Winter	30	+0%	100/15 Summer 100/15 Summer	96.857 -0.158
1.002	4	15 Winter	30	+0%	100/15 Summer	96.590 -0.105
1.003	5	15 Winter	30	+0%	30/15 Summer	96.536 0.041
1.004	6	15 Winter	30	+0%	100/15 Summer 100/15 Summer	96.233 -0.062
3.000	7	15 Winter	30	+0%	100/15 Summer	95.779 -0.071
3.001	8	15 Winter	30	+0%	30/15 Summer 100/15 Summer	94.790 0.615
3.002	9	15 Winter	30	+0%	30/15 Summer 100/15 Summer	94.673 0.633
3.003	10	15 Winter	30	+0%	30/15 Summer 100/15 Summer	94.473 0.923
3.004	11	15 Winter	30	+0%	30/15 Summer 100/15 Summer	94.180 1.150
1.005	12	15 Winter	30	+0%	30/15 Summer	94.028 1.398
1.006	13	15 Winter	30	+0%	30/15 Summer	93.143 0.923
1.007	14	15 Winter	30	+0%	100/15 Summer	91.274 -0.066
4.000	15	15 Winter	30	+0%	100/15 Summer	96.335 -0.120
4.001	16	15 Winter	30	+0%	30/15 Summer	92.832 0.067
4.002	17	15 Winter	30	+0%	30/15 Summer 100/15 Summer	92.637 0.262
5.000	18	15 Winter	30	+0%	30/15 Summer 100/15 Summer	92.445 0.195
4.003	19	15 Winter	30	+0%	100/15 Summer	91.893 -0.097
4.004	20	15 Winter	30	+0%	100/15 Summer	90.599 -0.151
1.008	21	15 Winter	30	+0%	30/15 Summer	89.539 0.259
1.009	22	960 Winter	30	+0%	2/60 Summer	88.783 0.583

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Pipe	Status	Level Exceeded	
		Volume (m³)	Flow / Cap.	Overflow (l/s)			Flow (l/s)
1.000	1	0.000	0.27		14.8	OK	
1.001	2	0.000	0.05		0.8	SURCHARGED	
2.000	3	0.000	0.19		11.8	OK	4
1.002	4	0.000	0.53		26.4	OK	
1.003	5	0.000	1.10		41.1	SURCHARGED	
1.004	6	0.000	0.81		88.7	OK	3
3.000	7	0.000	0.52		15.7	OK	
3.001	8	0.000	1.15		57.1	SURCHARGED	5
3.002	9	0.000	0.78		90.0	SURCHARGED	3
3.003	10	0.000	0.77		102.2	FLOOD RISK	5
3.004	11	0.000	0.77		122.5	FLOOD RISK	6
1.005	12	0.000	1.46		219.1	SURCHARGED	
1.006	13	0.000	1.43		233.6	SURCHARGED	
1.007	14	0.000	0.92		242.0	OK	
4.000	15	0.000	0.44		57.1	OK	
4.001	16	0.000	0.71		56.1	SURCHARGED	
4.002	17	0.000	1.30		75.7	SURCHARGED	2
5.000	18	0.000	1.32		28.4	SURCHARGED	2
4.003	19	0.000	0.78		131.2	OK	
4.004	20	0.000	0.48		146.9	OK	
1.008	21	0.000	1.18		383.9	SURCHARGED	
1.009	22	0.000	0.24		3.9	SURCHARGED	

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100 year Return Period 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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 389650 182600 ST 89650 82600 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status OFF
 Inertia 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) 2, 30, 100
 Climate Change (%) 0, 0, 40

US/MH		Return Climate		First (X)		First (Y)		First (Z)		Water	Surcharged
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Overflow	Act.	Level (m)	Depth (m)
1.000	1	15 Winter	100	+40%	100/15 Summer					97.631	0.081
1.001	2	240 Winter	100	+40%	2/15 Summer					97.556	0.806
2.000	3	15 Winter	100	+40%	100/15 Summer	100/15 Summer				97.685	0.670
1.002	4	15 Summer	100	+40%	100/15 Summer					97.763	1.068
1.003	5	15 Summer	100	+40%	30/15 Summer					97.753	1.258
1.004	6	15 Winter	100	+40%	100/15 Summer	100/15 Summer				97.502	1.207
3.000	7	15 Winter	100	+40%	100/15 Summer					96.550	0.700
3.001	8	15 Winter	100	+40%	30/15 Summer	100/15 Summer				95.390	1.215
3.002	9	15 Winter	100	+40%	30/15 Summer	100/15 Summer				95.241	1.201
3.003	10	15 Winter	100	+40%	30/15 Summer	100/15 Summer				94.760	1.210
3.004	11	30 Winter	100	+40%	30/15 Summer	100/15 Summer				94.268	1.238
1.005	12	15 Winter	100	+40%	30/15 Summer					94.251	1.621
1.006	13	15 Winter	100	+40%	30/15 Summer					93.572	1.352
1.007	14	15 Winter	100	+40%	100/15 Summer					91.837	0.497
4.000	15	15 Winter	100	+40%	100/15 Summer					96.637	0.182
4.001	16	15 Winter	100	+40%	30/15 Summer					94.633	1.868
4.002	17	15 Winter	100	+40%	30/15 Summer	100/15 Summer				94.061	1.686
5.000	18	15 Winter	100	+40%	30/15 Summer	100/15 Summer				93.451	1.201
4.003	19	15 Winter	100	+40%	100/15 Summer					92.586	0.596
4.004	20	15 Winter	100	+40%	100/15 Summer					90.827	0.077
1.008	21	15 Winter	100	+40%	30/15 Summer					90.015	0.735
1.009	22	1440 Winter	100	+40%	2/60 Summer					89.428	1.228

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded		Flow / Overflow (l/s)	Pipe	Status	Level
		Volume (m³)	Flow / Cap.		Flow (l/s)		Exceeded
1.000	1	0.000	0.48		26.6	SURCHARGED	
1.001	2	0.000	0.05		0.8	SURCHARGED	
2.000	3	5.365	0.86		52.0	FLOOD	4
1.002	4	0.000	1.13		56.3	FLOOD RISK	
1.003	5	0.000	1.75		65.8	FLOOD RISK	
1.004	6	2.330	0.95		104.2	FLOOD	3
3.000	7	0.000	0.82		24.6	SURCHARGED	
3.001	8	10.258	1.57		78.1	FLOOD	5
3.002	9	1.012	0.99		115.0	FLOOD	3
3.003	10	9.947	0.99		131.9	FLOOD	5
3.004	11	38.009	1.16		184.0	FLOOD	6
1.005	12	0.000	1.51		226.1	FLOOD RISK	
1.006	13	0.000	1.48		241.6	SURCHARGED	
1.007	14	0.000	0.95		249.5	SURCHARGED	
4.000	15	0.000	0.77		100.2	SURCHARGED	
4.001	16	0.000	1.20		95.3	FLOOD RISK	
4.002	17	1.100	2.08		121.0	FLOOD	2
5.000	18	0.837	2.03		43.6	FLOOD	2
4.003	19	0.000	1.19		201.2	SURCHARGED	
4.004	20	0.000	0.73		223.2	SURCHARGED	
1.008	21	0.000	1.45		470.0	SURCHARGED	
1.009	22	0.000	0.25		4.0	SURCHARGED	