STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 398031 338663 SJ 98031 38663
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
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

Time Area Diagram for Surface Network 1

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.860	4-8	2.463	8-12	0.415

Total Area Contributing (ha) = 3.739

Total Pipe Volume (m³) = 195.854

Network Design Table for Surface Network 1

« - 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	101.261	0.331	305.8	0.517	5.00	0.0	0.600	o	525	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	53.32	6.32	154.309	0.517	0.0	0.0	0.0	1.28	276.1	74.7

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Network Design Table for Surface Network 1

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
2.000	9.137	0.032	286.1	0.000	5.00	0.0	0.600	o	375	Pipe/Conduit	
1.001	54.711	0.176	310.8	0.288	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.002	38.668	0.125	310.1	0.140	0.00	0.0	0.600	o	525	Pipe/Conduit	
3.000	27.616	0.780	35.4	0.029	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	70.020	0.225	311.2	0.249	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.004	21.720	0.054	402.0	0.171	0.00	0.0	0.600	o	525	Pipe/Conduit	
4.000	69.277	0.292	237.0	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
4.001	12.862	0.054	237.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	20.699	0.048	431.2	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.006	39.760	0.076	523.2	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
5.000	36.412	0.154	237.0	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
5.001	31.480	0.133	237.0	0.136	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.002	14.447	0.061	237.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
6.000	19.111	0.115	166.1	0.000	5.00	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)
2.000	58.50	5.14	154.160	0.000	0.0	0.0	0.0	1.07	117.8	0.0
1.001	50.64	7.04	153.978	0.805	0.0	0.0	0.0	1.27	273.9	110.4
1.002	48.93	7.55	153.802	0.945	0.0	0.0	0.0	1.27	274.2	125.2
3.000	58.35	5.17	154.682	0.029	0.0	0.0	0.0	2.65	187.4	4.5
1.003	46.13	8.48	153.677	1.222	0.0	0.0	0.0	1.26	273.7	152.7
1.004	45.24	8.80	153.452	1.393	0.0	0.0	0.0	1.11	240.5	170.7
4.000	54.07	6.14	153.970	0.000	0.0	0.0	0.0	1.02	71.9	0.0
4.001	53.23	6.35	153.677	0.000	0.0	0.0	0.0	1.02	71.9	0.0
1.005	44.39	9.12	153.398	1.393	0.0	0.0	0.0	1.07	232.1	170.7
1.006	42.71	9.80	153.350	1.393	0.0	0.0	0.0	0.97	210.5	170.7
5.000	56.37	5.60	155.490	0.000	0.0	0.0	0.0	1.02	71.9	0.0
5.001	54.16	6.11	155.336	0.136	0.0	0.0	0.0	1.02	71.9	19.9
5.002	53.22	6.35	155.203	0.136	0.0	0.0	0.0	1.02	71.9	19.9
6.000	57.67	5.31	155.338	0.000	0.0	0.0	0.0	1.01	40.2	0.0

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Network Design Table for Surface Network 1

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
5.003	10.300	0.043	237.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.004	5.646	0.024	237.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.000	11.728	0.044	267.0	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
7.001	20.824	0.078	267.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.002	6.964	0.026	267.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.000	17.905	0.111	161.0	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
8.001	3.653	0.023	161.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
7.003	4.087	0.015	267.0	0.086	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.004	43.503	0.020	2175.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
9.000	9.577	0.031	313.0	0.366	5.00	0.0	0.600	o	375	Pipe/Conduit	
9.001	8.332	0.027	313.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
9.002	5.162	0.016	313.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.005	13.430	0.045	298.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.006	36.092	1.050	34.4	0.079	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.007	19.236	0.053	361.4	0.000	0.00	0.0	0.600	o	450	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)
5.003	52.56	6.52	155.142	0.136	0.0	0.0	0.0	1.02	71.9	19.9
5.004	52.21	6.61	155.099	0.136	0.0	0.0	0.0	1.02	71.9	19.9
7.000	58.20	5.20	155.258	0.000	0.0	0.0	0.0	0.96	67.7	0.0
7.001	56.51	5.57	155.214	0.000	0.0	0.0	0.0	0.96	67.7	0.0
7.002	55.97	5.69	155.136	0.000	0.0	0.0	0.0	0.96	67.7	0.0
8.000	57.79	5.29	155.288	0.000	0.0	0.0	0.0	1.03	40.9	0.0
8.001	57.51	5.35	155.176	0.000	0.0	0.0	0.0	1.03	40.9	0.0
7.003	55.66	5.76	155.110	0.086	0.0	0.0	0.0	0.96	67.7	12.9
7.004	48.55	7.67	155.020	0.086	0.0	0.0	0.0	0.38	41.9	12.9
9.000	58.43	5.16	155.074	0.366	0.0	0.0	0.0	1.02	112.5	58.0
9.001	57.78	5.29	155.043	0.366	0.0	0.0	0.0	1.02	112.5	58.0
9.002	57.38	5.38	155.016	0.366	0.0	0.0	0.0	1.02	112.5	58.0
5.005	47.88	7.88	155.000	0.588	0.0	0.0	0.0	1.04	115.3	76.2
5.006	47.29	8.08	154.955	0.667	0.0	0.0	0.0	3.10	342.4	85.4
5.007	46.41	8.38	153.829	0.667	0.0	0.0	0.0	1.06	169.2	85.4

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Network Design Table for Surface Network 1

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
10.000	11.786	0.262	45.0	0.040	5.00	0.0	0.600	o	225	Pipe/Conduit	
10.001	13.732	0.399	34.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.008	13.394	0.037	361.4	0.053	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.009	100.220	0.277	361.4	0.256	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.010	32.566	0.076	426.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
11.000	25.768	0.135	190.9	0.567	5.00	0.0	0.600	o	450	Pipe/Conduit	
11.001	39.769	0.207	192.1	0.223	0.00	0.0	0.600	o	600	Pipe/Conduit	
12.000	16.844	0.100	167.6	0.034	5.00	0.0	0.600	o	225	Pipe/Conduit	
13.000	6.558	0.039	167.0	0.036	5.00	0.0	0.600	o	225	Pipe/Conduit	
12.001	6.785	0.041	165.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.002	47.050	0.148	317.9	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
14.000	30.701	0.184	167.0	0.271	5.00	0.0	0.600	o	300	Pipe/Conduit	
14.001	14.629	0.088	167.0	0.119	0.00	0.0	0.600	o	375	Pipe/Conduit	
11.003	24.868	0.080	310.8	0.079	0.00	0.0	0.600	o	600	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)
10.000	58.71	5.10	154.662	0.040	0.0	0.0	0.0	1.96	77.7	6.4
10.001	58.21	5.20	154.400	0.040	0.0	0.0	0.0	2.24	89.0	6.4
5.008	45.81	8.59	153.776	0.760	0.0	0.0	0.0	1.06	169.2	94.3
5.009	41.89	10.16	153.739	1.016	0.0	0.0	0.0	1.06	169.2	115.3
5.010	40.68	10.72	153.461	1.016	0.0	0.0	0.0	0.98	155.5	115.3
11.000	57.78	5.29	154.105	0.567	0.0	0.0	0.0	1.47	233.5	88.7
11.001	56.04	5.67	153.820	0.790	0.0	0.0	0.0	1.75	495.8	119.9
12.000	57.84	5.28	154.129	0.034	0.0	0.0	0.0	1.01	40.0	5.3
13.000	58.67	5.11	154.068	0.036	0.0	0.0	0.0	1.01	40.1	5.7
12.001	57.32	5.39	154.029	0.070	0.0	0.0	0.0	1.01	40.3	10.9
11.002	53.62	6.25	153.613	0.860	0.0	0.0	0.0	1.36	384.6	124.8
14.000	57.17	5.42	154.036	0.271	0.0	0.0	0.0	1.21	85.8	42.0
14.001	56.38	5.60	153.778	0.390	0.0	0.0	0.0	1.40	154.5	59.6
11.003	52.45	6.55	153.465	1.329	0.0	0.0	0.0	1.38	389.0	188.8

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Network Design Table for Surface Network 1

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
5.011	7.672	0.035	219.2	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
5.012	16.879	0.076	222.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
15.000	12.872	0.050	257.4	0.000	5.00	0.0	0.600	o	600	Pipe/Conduit	
15.001	21.459	0.026	825.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.007	5.722	0.034	167.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.008	26.630	0.159	167.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.009	5.631	0.038	147.3	0.000	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)
5.011	40.52	10.79	153.385	2.345	0.0	0.0	0.0	1.64	463.9	257.4
5.012	40.16	10.97	153.350	2.345	0.0	0.0	0.0	1.63	460.9	257.4
15.000	58.51	5.14	153.350	0.000	0.0	0.0	0.0	1.51	427.8	0.0
15.001	56.50	5.57	153.300	0.000	0.0	0.0	0.0	0.84	237.4	0.0
1.007	40.06	11.02	153.274	3.739	0.0	0.0	0.0	1.88	532.0	405.6
1.008	39.19	11.46	153.240	3.739	0.0	0.0	0.0	1.01	40.1«	405.6
1.009	39.02	11.54	153.063	3.739	0.0	0.0	0.0	1.08	42.7«	405.6

Free Flowing Outfall Details for Surface Network 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.009	HW9	154.200	153.025	0.000	0	0

Simulation Criteria for Surface Network 1

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 Coeffiecient	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	4
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

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Simulation Criteria for Surface Network 1

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 398031 338663 SJ 98031 38663
Data Type	Point
Summer Storms	Yes
Winter Storms	No
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for Surface Network 1

Hydro-Brake® Optimum Manhole: S26, DS/PN: 5.006, Volume (m³): 11.6

Unit Reference	MD-SHE-0062-1500-0700-1500
Design Head (m)	0.700
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	62
Invert Level (m)	154.955
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.700	1.5
Flush-Flo™	0.211	1.5
Kick-Flo®	0.446	1.2
Mean Flow over Head Range	-	1.3

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	1.4	1.200	1.9	3.000	2.9	7.000	4.3
0.200	1.5	1.400	2.1	3.500	3.1	7.500	4.5
0.300	1.5	1.600	2.2	4.000	3.3	8.000	4.6
0.400	1.4	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.3	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.0		
1.000	1.8	2.600	2.7	6.500	4.2		

Hydro-Brake® Optimum Manhole: S23, DS/PN: 1.008, Volume (m³): 14.1

Unit Reference	MD-SHE-0119-7400-1500-7400
Design Head (m)	1.500
Design Flow (l/s)	7.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	119
Invert Level (m)	153.240
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

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Hydro-Brake® Optimum Manhole: S23, DS/PN: 1.008, Volume (m³): 14.1

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	7.4
Flush-Flo™	0.441	7.4
Kick-Flo®	0.920	5.9
Mean Flow over Head Range	-	6.5

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	4.2	1.200	6.7	3.000	10.3	7.000	15.3
0.200	6.7	1.400	7.2	3.500	11.0	7.500	15.9
0.300	7.2	1.600	7.6	4.000	11.8	8.000	16.4
0.400	7.4	1.800	8.1	4.500	12.4	8.500	16.8
0.500	7.4	2.000	8.5	5.000	13.1	9.000	17.3
0.600	7.3	2.200	8.9	5.500	13.7	9.500	17.8
0.800	6.7	2.400	9.2	6.000	14.3		
1.000	6.1	2.600	9.6	6.500	14.8		

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Storage Structures for Surface Network 1

Cellular Storage Manhole: S79, DS/PN: 2.000

Invert Level (m) 154.160 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	51.0	0.0	0.801	0.0	0.0
0.800	51.0	0.0			

Tank or Pond Manhole: HW4, DS/PN: 5.005

Invert Level (m) 155.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	0.0	0.301	1125.3	0.601	1170.3	0.901	1215.6
0.101	1095.4	0.401	1140.3	0.701	1185.4	1.000	1230.7
0.201	1110.3	0.501	1155.3	0.801	1200.5	1.001	1230.8

Cellular Storage Manhole: S27, DS/PN: 15.000

Invert Level (m) 153.350 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	2185.0	0.0	0.801	0.0	0.0
0.800	2185.0	0.0			

Tank or Pond Manhole: HW8, DS/PN: 1.007

Invert Level (m) 153.275

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	431.2	0.401	553.2	0.801	684.3	1.201	824.4
0.101	460.8	0.501	585.1	0.901	718.5	1.301	860.8
0.201	491.1	0.601	617.6	1.001	753.2	1.312	865.0
0.301	521.9	0.701	650.7	1.101	788.5		

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

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 4
Number of Online Controls 2 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 398031 338663 SJ 98031 38663
Data Type Point
Cv (Summer) 0.750
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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 30

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S9	15 Winter	2	+0%	100/15 Summer	100/15 Winter		
2.000	S79	15 Winter	2	+0%	100/15 Summer	100/15 Winter		
1.001	S8	15 Winter	2	+0%	30/15 Winter			
1.002	S16	15 Winter	2	+0%	30/15 Summer	100/30 Winter		
3.000	S67	15 Winter	2	+0%	100/15 Summer			
1.003	S68	15 Winter	2	+0%	30/15 Summer			
1.004	S3	15 Winter	2	+0%	30/15 Summer			
4.000	S24	15 Summer	2	+0%	100/15 Summer			
4.001	S25	180 Winter	2	+0%	30/15 Summer			
1.005	S42	180 Winter	2	+0%	30/15 Summer			
1.006	HW6	180 Winter	2	+0%	30/15 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S9	154.506	-0.328	0.000	0.28			71.6	OK	3
2.000	S79	154.164	-0.371	0.000	0.00		12	0.2	OK	2
1.001	S8	154.216	-0.286	0.000	0.41			101.8	OK	
1.002	S16	154.064	-0.262	0.000	0.48			114.3	OK	1
3.000	S67	154.714	-0.268	0.000	0.03			4.3	OK	
1.003	S68	153.959	-0.243	0.000	0.55			138.4	OK	
1.004	S3	153.820	-0.157	0.000	0.76			145.4	OK	
4.000	S24	153.970	-0.300	0.000	0.00			0.0	OK	
4.001	S25	153.797	-0.181	0.000	0.00			0.2	OK	
1.005	S42	153.797	-0.126	0.000	0.30			54.0	OK	
1.006	HW6	153.789	-0.086	0.000	0.29			52.6	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
5.000	S17	15 Summer	2	+0%	100/15 Winter			
5.001	S18	15 Winter	2	+0%	100/15 Summer			
5.002	S19	15 Winter	2	+0%	100/15 Summer			
6.000	S76	15 Summer	2	+0%				
5.003	S77	15 Winter	2	+0%	100/15 Summer			
5.004	HW3	15 Winter	2	+0%	100/15 Summer			
7.000	S70	15 Summer	2	+0%				
7.001	S71	15 Summer	2	+0%				
7.002	S72	15 Winter	2	+0%	100/240 Winter			
8.000	S74	15 Summer	2	+0%				
8.001	S78	15 Winter	2	+0%	100/180 Winter			
7.003	S73	15 Winter	2	+0%	100/180 Winter			
7.004	S75	600 Winter	2	+0%	100/120 Winter			
9.000	S21	15 Winter	2	+0%	30/15 Summer	100/15 Summer		
9.001	S63	15 Winter	2	+0%	30/15 Summer			
9.002	HW2	15 Winter	2	+0%	30/15 Summer			
5.005	HW4	600 Winter	2	+0%	100/120 Winter			
5.006	S26	600 Winter	2	+0%	30/15 Summer			
5.007	S12	15 Winter	2	+0%	30/15 Winter			
10.000	S59	15 Winter	2	+0%	100/15 Summer			
10.001	S60	15 Winter	2	+0%	100/15 Summer			
5.008	S61	15 Winter	2	+0%	30/15 Summer			
5.009	S13	15 Winter	2	+0%	30/15 Summer			
5.010	S14	180 Winter	2	+0%	30/15 Summer			
11.000	S35	15 Winter	2	+0%	100/15 Summer	100/15 Summer		
11.001	S36	15 Winter	2	+0%	30/15 Winter			
12.000	S39	15 Winter	2	+0%	30/15 Winter			
13.000	S65	15 Winter	2	+0%	30/15 Summer			
12.001	S64	15 Winter	2	+0%	30/15 Summer			
11.002	S40	15 Winter	2	+0%	30/15 Summer			
14.000	S66	15 Winter	2	+0%	30/15 Summer	100/15 Summer		
14.001	S41	15 Winter	2	+0%	30/15 Summer			
11.003	S37	15 Winter	2	+0%	30/15 Summer			
5.011	S38	180 Winter	2	+0%	30/15 Summer			
5.012	HW5	180 Winter	2	+0%	30/15 Summer			
15.000	S27	720 Winter	2	+0%	100/120 Winter			
15.001	HW7	180 Winter	2	+0%	30/30 Summer			
1.007	HW8	180 Winter	2	+0%	30/15 Winter			
1.008	S23	180 Winter	2	+0%	2/15 Summer			
1.009	S6	720 Summer	2	+0%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
5.000	S17	155.490	-0.300	0.000	0.00			0.0	OK
5.001	S18	155.441	-0.195	0.000	0.26			17.2	OK

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
5.002	S19	155.312	-0.191	0.000	0.28			17.0	OK
6.000	S76	155.338	-0.225	0.000	0.00			0.0	OK
5.003	S77	155.254	-0.188	0.000	0.30			17.0	OK
5.004	HW3	155.220	-0.179	0.000	0.34			16.8	OK
7.000	S70	155.258	-0.300	0.000	0.00			0.0	OK
7.001	S71	155.214	-0.300	0.000	0.00			0.0	OK
7.002	S72	155.197	-0.239	0.000	0.01			0.5	OK
8.000	S74	155.288	-0.225	0.000	0.00			0.0	OK
8.001	S78	155.189	-0.212	0.000	0.00			0.1	OK
7.003	S73	155.204	-0.206	0.000	0.21			10.2	OK
7.004	S75	155.180	-0.215	0.000	0.03			1.6	OK
9.000	S21	155.310	-0.139	0.000	0.68			54.9	OK
9.001	S63	155.280	-0.138	0.000	0.70			54.1	OK
9.002	HW2	155.253	-0.138	0.000	0.72			54.7	OK
5.005	HW4	155.180	-0.195	0.000	0.02			1.5	OK
5.006	S26	155.179	-0.151	0.000	0.00			1.5	OK
5.007	S12	153.917	-0.362	0.000	0.01			1.8	OK
10.000	S59	154.708	-0.179	0.000	0.09			6.1	OK
10.001	S60	154.442	-0.183	0.000	0.08			6.0	OK
5.008	S61	153.916	-0.309	0.000	0.12			13.9	OK
5.009	S13	153.902	-0.286	0.000	0.26			42.2	OK
5.010	S14	153.793	-0.119	0.000	0.10			13.8	OK
11.000	S35	154.313	-0.242	0.000	0.43			84.6	OK
11.001	S36	154.032	-0.388	0.000	0.27			112.7	OK
12.000	S39	154.186	-0.168	0.000	0.14			5.1	OK
13.000	S65	154.138	-0.155	0.000	0.18			5.4	OK
12.001	S64	154.122	-0.132	0.000	0.35			10.4	OK
11.002	S40	153.889	-0.324	0.000	0.35			116.6	OK
14.000	S66	154.192	-0.145	0.000	0.51			39.9	OK
14.001	S41	153.962	-0.190	0.000	0.48			55.5	OK
11.003	S37	153.816	-0.249	0.000	0.55			168.7	OK
5.011	S38	153.789	-0.196	0.000	0.24			63.1	OK
5.012	HW5	153.785	-0.165	0.000	0.19			62.5	OK
15.000	S27	153.584	-0.366	0.000	0.02			4.4	OK
15.001	HW7	153.685	-0.215	0.000	0.03			4.3	OK
1.007	HW8	153.780	-0.094	0.000	0.03			9.3	OK
1.008	S23	153.783	0.318	0.000	0.20			7.4	SURCHARGED
1.009	S6	153.139	-0.150	0.000	0.25			7.4	OK

PN	US/MH Name	Level Exceeded
5.000	S17	
5.001	S18	
5.002	S19	
6.000	S76	

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

PN	US/MH Name	Level Exceeded
5.003	S77	
5.004	HW3	
7.000	S70	
7.001	S71	
7.002	S72	
8.000	S74	
8.001	S78	
7.003	S73	
7.004	S75	
9.000	S21	2
9.001	S63	
9.002	HW2	
5.005	HW4	
5.006	S26	
5.007	S12	
10.000	S59	
10.001	S60	
5.008	S61	
5.009	S13	
5.010	S14	
11.000	S35	2
11.001	S36	
12.000	S39	
13.000	S65	
12.001	S64	
11.002	S40	
14.000	S66	2
14.001	S41	
11.003	S37	
5.011	S38	
5.012	HW5	
15.000	S27	
15.001	HW7	
1.007	HW8	
1.008	S23	
1.009	S6	

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

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	4
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 398031 338663 SJ 98031 38663
Data Type	Point
Cv (Summer)	0.750
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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 30

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S9	15 Winter	30	+0%	100/15 Summer	100/15 Winter		
2.000	S79	15 Winter	30	+0%	100/15 Summer	100/15 Winter		
1.001	S8	15 Winter	30	+0%	30/15 Winter			
1.002	S16	15 Winter	30	+0%	30/15 Summer	100/30 Winter		
3.000	S67	15 Winter	30	+0%	100/15 Summer			
1.003	S68	15 Winter	30	+0%	30/15 Summer			
1.004	S3	15 Winter	30	+0%	30/15 Summer			
4.000	S24	60 Winter	30	+0%	100/15 Summer			
4.001	S25	60 Winter	30	+0%	30/15 Summer			
1.005	S42	60 Winter	30	+0%	30/15 Summer			
1.006	HW6	60 Winter	30	+0%	30/15 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S9	154.636	-0.198	0.000	0.63			164.1	OK
2.000	S79	154.345	-0.189	0.000	0.32		6	27.6	OK
1.001	S8	154.540	0.038	0.000	0.76			187.1	SURCHARGED
1.002	S16	154.459	0.132	0.000	0.81			191.8	SURCHARGED
3.000	S67	154.729	-0.253	0.000	0.06			9.9	OK
1.003	S68	154.378	0.176	0.000	0.99			250.1	SURCHARGED
1.004	S3	154.161	0.184	0.000	1.45			277.2	SURCHARGED
4.000	S24	154.124	-0.145	0.000	0.00			0.2	OK
4.001	S25	154.124	0.147	0.000	0.04			2.6	SURCHARGED
1.005	S42	154.125	0.202	0.000	1.10			196.6	SURCHARGED
1.006	HW6	154.094	0.219	0.000	1.04			190.7	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	S9	3
2.000	S79	2
1.001	S8	
1.002	S16	1
3.000	S67	
1.003	S68	
1.004	S3	
4.000	S24	
4.001	S25	
1.005	S42	
1.006	HW6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
5.000	S17	15 Winter	30	+0%	100/15 Winter			
5.001	S18	15 Winter	30	+0%	100/15 Summer			
5.002	S19	15 Winter	30	+0%	100/15 Summer			
6.000	S76	15 Winter	30	+0%				
5.003	S77	15 Winter	30	+0%	100/15 Summer			
5.004	HW3	15 Winter	30	+0%	100/15 Summer			
7.000	S70	720 Winter	30	+0%				
7.001	S71	720 Winter	30	+0%				
7.002	S72	720 Winter	30	+0%	100/240 Winter			
8.000	S74	720 Winter	30	+0%				
8.001	S78	720 Winter	30	+0%	100/180 Winter			
7.003	S73	720 Winter	30	+0%	100/180 Winter			
7.004	S75	720 Winter	30	+0%	100/120 Winter			
9.000	S21	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
9.001	S63	15 Winter	30	+0%	30/15 Summer			
9.002	HW2	15 Winter	30	+0%	30/15 Summer			
5.005	HW4	720 Winter	30	+0%	100/120 Winter			
5.006	S26	15 Winter	30	+0%	30/15 Summer			
5.007	S12	15 Winter	30	+0%	30/15 Winter			
10.000	S59	15 Winter	30	+0%	100/15 Summer			
10.001	S60	15 Winter	30	+0%	100/15 Summer			
5.008	S61	15 Winter	30	+0%	30/15 Summer			
5.009	S13	15 Winter	30	+0%	30/15 Summer			
5.010	S14	15 Winter	30	+0%	30/15 Summer			
11.000	S35	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
11.001	S36	15 Winter	30	+0%	30/15 Winter			
12.000	S39	15 Winter	30	+0%	30/15 Winter			
13.000	S65	15 Winter	30	+0%	30/15 Summer			
12.001	S64	15 Winter	30	+0%	30/15 Summer			
11.002	S40	15 Winter	30	+0%	30/15 Summer			
14.000	S66	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
14.001	S41	15 Winter	30	+0%	30/15 Summer			
11.003	S37	15 Winter	30	+0%	30/15 Summer			
5.011	S38	15 Winter	30	+0%	30/15 Summer			
5.012	HW5	120 Winter	30	+0%	30/15 Summer			
15.000	S27	960 Winter	30	+0%	100/120 Winter			
15.001	HW7	120 Winter	30	+0%	30/30 Summer			
1.007	HW8	120 Winter	30	+0%	30/15 Winter			
1.008	S23	120 Winter	30	+0%	2/15 Summer			
1.009	S6	10080 Winter	30	+0%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
5.000	S17	155.525	-0.265	0.000	0.00			0.3	OK
5.001	S18	155.532	-0.104	0.000	0.73			48.0	OK

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
5.002	S19	155.407	-0.096	0.000	0.80			47.8	OK
6.000	S76	155.347	-0.216	0.000	0.00			0.1	OK
5.003	S77	155.361	-0.081	0.000	0.81			46.0	OK
5.004	HW3	155.329	-0.069	0.000	0.94			46.4	OK
7.000	S70	155.301	-0.257	0.000	0.00			0.0	OK
7.001	S71	155.301	-0.213	0.000	0.00			0.0	OK
7.002	S72	155.301	-0.135	0.000	0.00			0.0	OK
8.000	S74	155.301	-0.212	0.000	0.00			0.0	OK
8.001	S78	155.301	-0.101	0.000	0.00			0.0	OK
7.003	S73	155.301	-0.109	0.000	0.05			2.4	OK
7.004	S75	155.301	-0.094	0.000	0.04			2.4	OK
9.000	S21	155.673	0.224	0.000	1.53			123.3	SURCHARGED
9.001	S63	155.567	0.149	0.000	1.60			124.2	SURCHARGED
9.002	HW2	155.461	0.070	0.000	1.64			124.9	SURCHARGED
5.005	HW4	155.301	-0.074	0.000	0.02			1.5	OK
5.006	S26	155.342	0.012	0.000	0.00			1.5	SURCHARGED
5.007	S12	154.304	0.025	0.000	0.04			6.1	SURCHARGED
10.000	S59	154.732	-0.155	0.000	0.21			13.9	OK
10.001	S60	154.464	-0.161	0.000	0.18			13.7	OK
5.008	S61	154.305	0.079	0.000	0.23			26.1	SURCHARGED
5.009	S13	154.299	0.110	0.000	0.60			96.7	SURCHARGED
5.010	S14	154.239	0.328	0.000	0.57			77.1	SURCHARGED
11.000	S35	154.512	-0.043	0.000	0.98			192.5	OK
11.001	S36	154.428	0.008	0.000	0.61			257.5	SURCHARGED
12.000	S39	154.415	0.060	0.000	0.32			11.5	SURCHARGED
13.000	S65	154.406	0.113	0.000	0.41			12.2	SURCHARGED
12.001	S64	154.397	0.143	0.000	0.75			22.6	SURCHARGED
11.002	S40	154.378	0.165	0.000	0.67			224.3	SURCHARGED
14.000	S66	154.583	0.246	0.000	1.15			90.0	SURCHARGED
14.001	S41	154.375	0.223	0.000	1.06			122.3	SURCHARGED
11.003	S37	154.310	0.245	0.000	1.13			346.7	SURCHARGED
5.011	S38	154.203	0.218	0.000	1.56			418.8	SURCHARGED
5.012	HW5	154.080	0.130	0.000	0.47			155.4	SURCHARGED
15.000	S27	153.813	-0.137	0.000	0.01			4.3	OK
15.001	HW7	153.976	0.076	0.000	0.03			4.3	SURCHARGED
1.007	HW8	154.060	0.186	0.000	0.04			11.1	SURCHARGED
1.008	S23	154.079	0.614	0.000	0.20			7.4	SURCHARGED
1.009	S6	153.139	-0.150	0.000	0.25			7.4	OK

PN	US/MH Name	Level Exceeded
5.000	S17	
5.001	S18	
5.002	S19	
6.000	S76	

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

PN	US/MH Name	Level Exceeded
5.003	S77	
5.004	HW3	
7.000	S70	
7.001	S71	
7.002	S72	
8.000	S74	
8.001	S78	
7.003	S73	
7.004	S75	
9.000	S21	2
9.001	S63	
9.002	HW2	
5.005	HW4	
5.006	S26	
5.007	S12	
10.000	S59	
10.001	S60	
5.008	S61	
5.009	S13	
5.010	S14	
11.000	S35	2
11.001	S36	
12.000	S39	
13.000	S65	
12.001	S64	
11.002	S40	
14.000	S66	2
14.001	S41	
11.003	S37	
5.011	S38	
5.012	HW5	
15.000	S27	
15.001	HW7	
1.007	HW8	
1.008	S23	
1.009	S6	

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

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 4
Number of Online Controls 2 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 398031 338663 SJ 98031 38663
Data Type Point
Cv (Summer) 0.750
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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 30

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S9	15 Winter	100	+30%	100/15 Summer	100/15 Winter		
2.000	S79	30 Winter	100	+30%	100/15 Summer	100/15 Winter		
1.001	S8	30 Winter	100	+30%	30/15 Winter			
1.002	S16	30 Winter	100	+30%	30/15 Summer	100/30 Winter		
3.000	S67	30 Winter	100	+30%	100/15 Summer			
1.003	S68	30 Winter	100	+30%	30/15 Summer			
1.004	S3	30 Winter	100	+30%	30/15 Summer			
4.000	S24	30 Winter	100	+30%	100/15 Summer			
4.001	S25	30 Winter	100	+30%	30/15 Summer			
1.005	S42	30 Winter	100	+30%	30/15 Summer			
1.006	HW6	30 Winter	100	+30%	30/15 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S9	155.898	1.064	8.105	1.07			279.5	FLOOD
2.000	S79	155.742	1.207	7.506	0.76		12	64.8	FLOOD
1.001	S8	155.820	1.317	0.000	1.12			276.8	FLOOD RISK
1.002	S16	155.680	1.353	0.025	1.27			301.7	FLOOD
3.000	S67	155.540	0.558	0.000	0.08			13.0	SURCHARGED
1.003	S68	155.529	1.327	0.000	1.48			373.4	SURCHARGED
1.004	S3	155.063	1.086	0.000	2.19			418.0	FLOOD RISK
4.000	S24	154.785	0.515	0.000	0.02			1.6	FLOOD RISK
4.001	S25	154.787	0.810	0.000	0.06			3.7	SURCHARGED
1.005	S42	154.792	0.869	0.000	2.30			411.0	SURCHARGED
1.006	HW6	154.551	0.676	0.000	2.20			403.6	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	S9	3
2.000	S79	2
1.001	S8	
1.002	S16	1
3.000	S67	
1.003	S68	
1.004	S3	
4.000	S24	
4.001	S25	
1.005	S42	
1.006	HW6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
5.000	S17	15 Winter	100	+30%	100/15 Winter			
5.001	S18	15 Winter	100	+30%	100/15 Summer			
5.002	S19	15 Winter	100	+30%	100/15 Summer			
6.000	S76	15 Winter	100	+30%				
5.003	S77	15 Winter	100	+30%	100/15 Summer			
5.004	HW3	960 Winter	100	+30%	100/15 Summer			
7.000	S70	960 Winter	100	+30%				
7.001	S71	960 Winter	100	+30%				
7.002	S72	960 Winter	100	+30%	100/240 Winter			
8.000	S74	960 Winter	100	+30%				
8.001	S78	960 Winter	100	+30%	100/180 Winter			
7.003	S73	960 Winter	100	+30%	100/180 Winter			
7.004	S75	960 Winter	100	+30%	100/120 Winter			
9.000	S21	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
9.001	S63	15 Summer	100	+30%	30/15 Summer			
9.002	HW2	15 Summer	100	+30%	30/15 Summer			
5.005	HW4	960 Winter	100	+30%	100/120 Winter			
5.006	S26	960 Winter	100	+30%	30/15 Summer			
5.007	S12	15 Winter	100	+30%	30/15 Winter			
10.000	S59	15 Winter	100	+30%	100/15 Summer			
10.001	S60	15 Winter	100	+30%	100/15 Summer			
5.008	S61	15 Winter	100	+30%	30/15 Summer			
5.009	S13	15 Winter	100	+30%	30/15 Summer			
5.010	S14	15 Winter	100	+30%	30/15 Summer			
11.000	S35	15 Winter	100	+30%	100/15 Summer	100/15 Summer		
11.001	S36	15 Winter	100	+30%	30/15 Winter			
12.000	S39	15 Winter	100	+30%	30/15 Winter			
13.000	S65	15 Winter	100	+30%	30/15 Summer			
12.001	S64	15 Winter	100	+30%	30/15 Summer			
11.002	S40	15 Winter	100	+30%	30/15 Summer			
14.000	S66	15 Winter	100	+30%	30/15 Summer	100/15 Summer		
14.001	S41	15 Winter	100	+30%	30/15 Summer			
11.003	S37	15 Winter	100	+30%	30/15 Summer			
5.011	S38	15 Winter	100	+30%	30/15 Summer			
5.012	HW5	30 Winter	100	+30%	30/15 Summer			
15.000	S27	960 Winter	100	+30%	100/120 Winter			
15.001	HW7	960 Winter	100	+30%	30/30 Summer			
1.007	HW8	60 Winter	100	+30%	30/15 Winter			
1.008	S23	60 Winter	100	+30%	2/15 Summer			
1.009	S6	8640 Winter	100	+30%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
5.000	S17	155.792	0.002	0.000	0.03			1.8	SURCHARGED
5.001	S18	155.793	0.157	0.000	1.20			78.6	SURCHARGED

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
5.002	S19	155.621	0.118	0.000	1.23			73.5	SURCHARGED
6.000	S76	155.521	-0.042	0.000	0.03			1.1	OK
5.003	S77	155.526	0.084	0.000	1.28			72.3	SURCHARGED
5.004	HW3	155.496	0.097	0.000	0.10			5.0	SURCHARGED
7.000	S70	155.495	-0.063	0.000	0.00			0.0	OK
7.001	S71	155.495	-0.019	0.000	0.00			0.0	OK
7.002	S72	155.495	0.059	0.000	0.00			0.0	SURCHARGED
8.000	S74	155.495	-0.017	0.000	0.00			0.0	OK
8.001	S78	155.495	0.094	0.000	0.00			0.0	SURCHARGED
7.003	S73	155.496	0.085	0.000	0.06			2.9	SURCHARGED
7.004	S75	155.496	0.101	0.000	0.05			2.9	SURCHARGED
9.000	S21	156.251	0.802	0.955	2.66			213.8	FLOOD
9.001	S63	155.954	0.536	0.000	2.74			212.7	FLOOD RISK
9.002	HW2	155.655	0.264	0.000	2.79			213.1	SURCHARGED
5.005	HW4	155.496	0.121	0.000	0.01			1.3	SURCHARGED
5.006	S26	155.495	0.165	0.000	0.00			1.5	SURCHARGED
5.007	S12	155.435	1.156	0.000	0.15			20.8	SURCHARGED
10.000	S59	155.486	0.599	0.000	0.35			22.9	SURCHARGED
10.001	S60	155.459	0.834	0.000	0.32			24.5	SURCHARGED
5.008	S61	155.439	1.213	0.000	0.46			52.7	SURCHARGED
5.009	S13	155.430	1.242	0.000	0.88			141.5	SURCHARGED
5.010	S14	155.165	1.253	0.000	1.05			141.4	FLOOD RISK
11.000	S35	156.105	1.550	5.568	1.60			313.5	FLOOD
11.001	S36	155.919	1.499	0.000	1.01			424.1	FLOOD RISK
12.000	S39	155.851	1.497	0.000	0.49			17.6	SURCHARGED
13.000	S65	155.836	1.543	0.000	0.64			19.2	SURCHARGED
12.001	S64	155.817	1.563	0.000	1.27			37.9	FLOOD RISK
11.002	S40	155.762	1.549	0.000	1.25			418.9	FLOOD RISK
14.000	S66	156.202	1.866	2.272	1.84			143.4	FLOOD
14.001	S41	155.768	1.616	0.000	1.76			204.4	SURCHARGED
11.003	S37	155.526	1.461	0.000	2.11			648.2	SURCHARGED
5.011	S38	155.084	1.099	0.000	2.94			787.2	FLOOD RISK
5.012	HW5	154.504	0.554	0.000	2.10			701.1	FLOOD RISK
15.000	S27	154.261	0.311	0.000	0.01			3.6	SURCHARGED
15.001	HW7	154.261	0.361	0.000	0.03			3.6	SURCHARGED
1.007	HW8	154.365	0.491	0.000	0.05			15.1	SURCHARGED
1.008	S23	154.390	0.925	0.000	0.20			7.4	SURCHARGED
1.009	S6	153.139	-0.150	0.000	0.25			7.4	OK

PN	US/MH Name	Level Exceeded
5.000	S17	
5.001	S18	
5.002	S19	
6.000	S76	

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