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)	2	PIMP (%)	100
M5-60 (mm)	21.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
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 (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	2.964	4-8	6.933	8-12	1.352

Total Area Contributing (ha) = 11.250

Total Pipe Volume (m³) = 1685.231

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	90.000	0.180	500.0	0.796	4.00	0.0	0.600	o	1050	Pipe/Conduit	
1.001	90.000	0.180	500.0	1.526	0.00	0.0	0.600	o	1050	Pipe/Conduit	
2.000	24.000	0.060	400.0	0.138	4.00	0.0	0.600	o	450	Pipe/Conduit	
2.001	28.000	0.070	400.0	0.013	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)
1.000	50.00	4.98	153.665	0.796	0.0	0.0	0.0	1.53	1328.5	107.8
1.001	50.00	5.96	153.485	2.322	0.0	0.0	0.0	1.53	1328.5	314.4
2.000	50.00	4.40	156.000	0.138	0.0	0.0	0.0	1.01	160.7	18.7
2.001	50.00	4.86	155.940	0.151	0.0	0.0	0.0	1.01	160.7	20.4

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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	24.008	0.060	400.1	0.028	4.00	0.0	0.600	o	450	Pipe/Conduit	
2.002	75.000	1.974	38.0	0.075	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.002	22.000	0.044	500.0	0.303	0.00	0.0	0.600	o	1050	Pipe/Conduit	
1.003	70.000	0.354	197.7	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
4.000	65.000	0.650	100.0	0.096	4.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	90.000	0.529	170.1	0.092	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	11.498	0.068	169.1	0.050	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	57.000	0.570	100.0	0.113	4.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	90.000	0.535	168.2	0.136	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.003	18.451	0.098	188.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
6.000	65.000	0.673	96.6	0.039	4.00	0.0	0.600	o	100	Pipe/Conduit	
6.001	90.000	0.909	99.0	0.050	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.004	25.848	0.321	80.5	0.043	0.00	0.0	0.600	o	300	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	4.40	156.000	0.028	0.0	0.0	0.0	1.01	160.7	3.8
2.002	50.00	5.24	155.870	0.254	0.0	0.0	0.0	3.31	525.8	34.4
1.002	50.00	6.19	153.296	2.879	0.0	0.0	0.0	1.53	1328.5	389.9
1.003	50.00	6.67	153.252	2.879	0.0	0.0	0.0	2.45	2119.0	389.9
4.000	50.00	5.08	156.033	0.096	0.0	0.0	0.0	1.00	17.8	13.0
4.001	50.00	6.58	155.308	0.188	0.0	0.0	0.0	1.00	39.7	25.5
4.002	50.00	6.77	154.779	0.238	0.0	0.0	0.0	1.00	39.9	32.2
5.000	50.00	4.95	156.143	0.113	0.0	0.0	0.0	1.00	17.8	15.3
5.001	50.00	6.44	155.498	0.249	0.0	0.0	0.0	1.01	40.0	33.7
4.003	50.00	7.04	154.636	0.487	0.0	0.0	0.0	1.14	80.8	65.9
6.000	50.00	5.38	155.751	0.039	0.0	0.0	0.0	0.78	6.1	5.3
6.001	50.00	6.87	155.028	0.089	0.0	0.0	0.0	1.01	17.8	12.1
4.004	50.00	7.28	153.969	0.619	0.0	0.0	0.0	1.75	124.0	83.8

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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
1.004	67.000	0.134	500.0	0.131	0.00	0.0	0.600	o	1050	Pipe/Conduit	
1.005	24.000	0.048	500.0	0.147	0.00	0.0	0.600	o	1050	Pipe/Conduit	
7.000	19.000	0.038	500.0	0.330	4.00	0.0	0.600	o	1050	Pipe/Conduit	
1.006	32.598	0.235	138.7	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
8.000	15.000	0.030	500.0	0.310	4.00	0.0	0.600	o	1050	Pipe/Conduit	
8.001	22.000	0.044	500.0	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
8.002	90.000	0.180	500.0	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
8.003	50.000	0.100	500.0	1.055	0.00	0.0	0.600	o	1050	Pipe/Conduit	
9.000	27.817	0.056	496.7	0.294	4.00	0.0	0.600	o	1050	Pipe/Conduit	
9.001	70.000	0.140	500.0	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
10.000	25.649	0.051	502.9	0.484	4.00	0.0	0.600	o	1050	Pipe/Conduit	
9.002	29.923	0.060	500.0	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
11.000	29.014	0.058	500.2	0.515	4.00	0.0	0.600	o	1050	Pipe/Conduit	
9.003	46.356	0.093	500.0	0.000	0.00	0.0	0.600	o	1050	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)
1.004	50.00	8.01	152.898	3.629	0.0	0.0	0.0	1.53	1328.5	491.4
1.005	50.00	8.27	152.764	3.776	0.0	0.0	0.0	1.53	1328.5	511.3
7.000	50.00	4.21	152.500	0.330	0.0	0.0	0.0	1.53	1328.5	44.7
1.006	50.00	8.46	152.462	4.106	0.0	0.0	0.0	2.92	2532.2	556.0
8.000	50.00	4.16	153.250	0.310	0.0	0.0	0.0	1.53	1328.5	42.0
8.001	50.00	4.40	153.220	0.310	0.0	0.0	0.0	1.53	1328.5	42.0
8.002	50.00	5.38	153.176	0.310	0.0	0.0	0.0	1.53	1328.5	42.0
8.003	50.00	5.92	152.996	1.365	0.0	0.0	0.0	1.53	1328.5	184.8
9.000	50.00	4.30	153.500	0.294	0.0	0.0	0.0	1.54	1332.9	39.8
9.001	50.00	5.06	153.444	0.294	0.0	0.0	0.0	1.53	1328.5	39.8
10.000	50.00	4.28	153.355	0.484	0.0	0.0	0.0	1.53	1324.6	65.5
9.002	50.00	5.39	153.304	0.778	0.0	0.0	0.0	1.53	1328.5	105.4
11.000	50.00	4.32	153.282	0.515	0.0	0.0	0.0	1.53	1328.2	69.7
9.003	50.00	5.89	153.224	1.293	0.0	0.0	0.0	1.53	1328.5	175.1

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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
9.004	49.934	0.100	500.0	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
9.005	90.000	0.180	500.0	0.323	0.00	0.0	0.600	o	1050	Pipe/Conduit	
9.006	90.000	0.180	500.0	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
9.007	80.470	0.161	500.0	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
9.008	20.000	0.040	500.0	0.357	0.00	0.0	0.600	o	1050	Pipe/Conduit	
8.004	51.000	0.244	209.1	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
1.007	3.874	0.008	500.0	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
12.000	90.000	0.180	500.0	1.180	4.00	0.0	0.600	o	1050	Pipe/Conduit	
13.000	40.000	0.080	500.0	0.060	4.00	0.0	0.600	o	1050	Pipe/Conduit	
13.001	70.000	0.268	261.2	0.220	0.00	0.0	0.600	o	1050	Pipe/Conduit	
12.001	90.000	0.180	500.0	0.479	0.00	0.0	0.600	o	1050	Pipe/Conduit	
12.002	90.000	0.180	500.0	0.516	0.00	0.0	0.600	o	1050	Pipe/Conduit	
12.003	60.000	0.220	272.7	0.813	0.00	0.0	0.600	o	1050	Pipe/Conduit	
12.004	72.464	0.072	1006.4	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
12.005	107.000	0.214	500.0	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
12.006	36.000	0.072	500.0	0.000	0.00	0.0	0.600	o	1050	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)
9.004	50.00	6.43	153.131	1.293	0.0	0.0	0.0	1.53	1328.5	175.1
9.005	50.00	7.41	153.031	1.616	0.0	0.0	0.0	1.53	1328.5	218.8
9.006	50.00	8.39	152.851	1.616	0.0	0.0	0.0	1.53	1328.5	218.8
9.007	50.00	9.26	152.671	1.616	0.0	0.0	0.0	1.53	1328.5	218.8
9.008	50.00	9.48	152.510	1.973	0.0	0.0	0.0	1.53	1328.5	267.2
8.004	50.00	9.84	152.470	3.338	0.0	0.0	0.0	2.38	2060.5	452.0
1.007	50.00	9.88	152.227	7.444	0.0	0.0	0.0	1.53	1328.5	1008.0
12.000	50.00	4.98	153.832	1.180	0.0	0.0	0.0	1.53	1328.5	159.8
13.000	50.00	4.43	154.000	0.060	0.0	0.0	0.0	1.53	1328.5	8.1
13.001	50.00	4.98	153.920	0.280	0.0	0.0	0.0	2.13	1842.3	37.9
12.001	50.00	5.96	153.652	1.939	0.0	0.0	0.0	1.53	1328.5	262.6
12.002	50.00	6.94	153.472	2.455	0.0	0.0	0.0	1.53	1328.5	332.4
12.003	50.00	7.42	153.292	3.268	0.0	0.0	0.0	2.08	1802.7	442.5
12.004	50.00	8.54	153.072	3.268	0.0	0.0	0.0	1.08	933.3	442.5
12.005	50.00	9.70	153.000	3.268	0.0	0.0	0.0	1.53	1328.5	442.5
12.006	50.00	10.09	152.786	3.268	0.0	0.0	0.0	1.53	1328.5	442.5

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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
14.000	85.000	1.453	58.5	0.163	4.00	0.0	0.600	o	300	Pipe/Conduit	
14.001	60.000	1.147	52.3	0.099	0.00	0.0	0.600	o	300	Pipe/Conduit	
14.002	74.000	0.708	104.5	0.128	0.00	0.0	0.600	o	450	Pipe/Conduit	
14.003	69.067	0.750	92.1	0.148	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	23.772	3.087	7.7	0.000	0.00	0.0	0.600	o	300	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)
14.000	50.00	4.69	158.200	0.163	0.0	0.0	0.0	2.06	145.6	22.1
14.001	50.00	5.15	156.747	0.262	0.0	0.0	0.0	2.18	154.0	35.5
14.002	50.00	5.77	155.450	0.390	0.0	0.0	0.0	1.99	316.2	52.8
14.003	50.00	6.31	154.742	0.538	0.0	0.0	0.0	2.12	337.0	72.9
1.008	50.00	10.16	152.219	11.250	0.0	0.0	0.0	5.70	402.9«	1523.4

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	155.892	2.227	Open Manhole	2100	1.000	153.665	1050				
2	155.886	2.401	Open Manhole	2100	1.001	153.485	1050	1.000	153.485	1050	
3	157.893	1.893	Open Manhole	1350	2.000	156.000	450				
4	157.726	1.786	Open Manhole	1350	2.001	155.940	450	2.000	155.940	450	
5	157.875	1.875	Open Manhole	1350	3.000	156.000	450				
6	157.723	1.853	Open Manhole	1350	2.002	155.870	450	2.001	155.870	450	
								3.000	155.940	450	70
7	155.881	2.585	Open Manhole	2100	1.002	153.296	1050	1.001	153.305	1050	9
								2.002	153.896	450	
8	156.069	2.817	Open Manhole	2100	1.003	153.252	1050	1.002	153.252	1050	
9	158.000	1.967	Open Manhole	600	4.000	156.033	150				
10	156.147	0.839	Open Manhole	600	4.001	155.308	225	4.000	155.383	150	
11	156.360	1.581	Open Manhole	1200	4.002	154.779	225	4.001	154.779	225	
12	158.150	2.007	Open Manhole	600	5.000	156.143	150				
13	156.300	0.802	Open Manhole	600	5.001	155.498	225	5.000	155.573	150	
14	156.085	1.449	Open Manhole	1200	4.003	154.636	300	4.002	154.711	225	
								5.001	154.963	225	252
15	158.103	2.352	Open Manhole	600	6.000	155.751	100				
16	156.525	1.497	Open Manhole	600	6.001	155.028	150	6.000	155.078	100	
17	155.778	1.809	Open Manhole	1200	4.004	153.969	300	4.003	154.538	300	569
								6.001	154.119	150	
18	155.778	2.880	Open Manhole	2100	1.004	152.898	1050	1.003	152.898	1050	
								4.004	153.648	300	
19	155.793	3.029	Open Manhole	2100	1.005	152.764	1050	1.004	152.764	1050	
20	155.096	2.596	Open Manhole	2400	7.000	152.500	1050				
21	155.570	3.108	Open Manhole	2100	1.006	152.462	1050	1.005	152.716	1050	254
								7.000	152.462	1050	
22	155.863	2.613	Open Manhole	2100	8.000	153.250	1050				
23	155.747	2.527	Open Manhole	2100	8.001	153.220	1050	8.000	153.220	1050	
24	155.897	2.721	Open Manhole	2100	8.002	153.176	1050	8.001	153.176	1050	
25	155.747	2.751	Open Manhole	2100	8.003	152.996	1050	8.002	152.996	1050	
26	155.719	2.219	Open Manhole	1950	9.000	153.500	1050				
27	155.747	2.303	Open Manhole	1950	9.001	153.444	1050	9.000	153.444	1050	
28	155.689	2.334	Open Manhole	1950	10.000	153.355	1050				
29	155.724	2.420	Open Manhole	1950	9.002	153.304	1050	9.001	153.304	1050	
								10.000	153.304	1050	
30	155.741	2.459	Open Manhole	1950	11.000	153.282	1050				
31	155.369	2.145	Open Manhole	1950	9.003	153.224	1050	9.002	153.244	1050	20

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdr (mm)
								11.000	153.224	1050	
32	155.387	2.256	Open Manhole	1950	9.004	153.131	1050	9.003	153.131	1050	
33	155.833	2.802	Open Manhole	1950	9.005	153.031	1050	9.004	153.031	1050	
34	155.834	2.983	Open Manhole	1950	9.006	152.851	1050	9.005	152.851	1050	
35	155.831	3.160	Open Manhole	1950	9.007	152.671	1050	9.006	152.671	1050	
36	155.904	3.394	Open Manhole	2100	9.008	152.510	1050	9.007	152.510	1050	
37	155.918	3.448	Open Manhole	2100	8.004	152.470	1050	8.003	152.896	1050	4
								9.008	152.470	1050	
38	155.500	3.273	Open Manhole	2100	1.007	152.227	1050	1.006	152.227	1050	
								8.004	152.227	1050	
39	155.629	1.797	Open Manhole	2100	12.000	153.832	1050				
40	156.961	2.961	Open Manhole	2100	13.000	154.000	1050				
41	156.980	3.060	Open Manhole	2100	13.001	153.920	1050	13.000	153.920	1050	
42	154.952	1.300	Open Manhole	2100	12.001	153.652	1050	12.000	153.652	1050	
								13.001	153.652	1050	
43	155.369	1.897	Open Manhole	2100	12.002	153.472	1050	12.001	153.472	1050	
44	154.988	1.696	Open Manhole	2400	12.003	153.292	1050	12.002	153.292	1050	
headwall	155.000	1.928	Open Manhole	2400	12.004	153.072	1050	12.003	153.072	1050	
headwall	155.000	2.000	Open Manhole	2400	12.005	153.000	1050	12.004	153.000	1050	
45	155.187	2.401	Open Manhole	2400	12.006	152.786	1050	12.005	152.786	1050	
46	159.596	1.396	Open Manhole	1200	14.000	158.200	300				
47	158.294	1.547	Open Manhole	1200	14.001	156.747	300	14.000	156.747	300	
48	157.300	1.850	Open Manhole	1350	14.002	155.450	450	14.001	155.600	300	
49	156.592	1.850	Open Manhole	1350	14.003	154.742	450	14.002	154.742	450	
50	155.500	3.281	Open Manhole	2400	1.008	152.219	300	1.007	152.219	1050	
								12.006	152.714	1050	12
								14.003	153.992	450	19
	150.220	1.088	Open Manhole	0		OUTFALL		1.008	149.132	300	

No coordinates have been specified, layout information cannot be produced.

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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	1050	1	155.892	153.665	1.177	Open Manhole	2100
1.001	o	1050	2	155.886	153.485	1.351	Open Manhole	2100
2.000	o	450	3	157.893	156.000	1.443	Open Manhole	1350
2.001	o	450	4	157.726	155.940	1.336	Open Manhole	1350
3.000	o	450	5	157.875	156.000	1.425	Open Manhole	1350
2.002	o	450	6	157.723	155.870	1.403	Open Manhole	1350
1.002	o	1050	7	155.881	153.296	1.535	Open Manhole	2100
1.003	o	1050	8	156.069	153.252	1.767	Open Manhole	2100
4.000	o	150	9	158.000	156.033	1.817	Open Manhole	600
4.001	o	225	10	156.147	155.308	0.614	Open Manhole	600
4.002	o	225	11	156.360	154.779	1.356	Open Manhole	1200
5.000	o	150	12	158.150	156.143	1.857	Open Manhole	600
5.001	o	225	13	156.300	155.498	0.577	Open Manhole	600
4.003	o	300	14	156.085	154.636	1.149	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	90.000	500.0	2	155.886	153.485	1.351	Open Manhole	2100
1.001	90.000	500.0	7	155.881	153.305	1.526	Open Manhole	2100
2.000	24.000	400.0	4	157.726	155.940	1.336	Open Manhole	1350
2.001	28.000	400.0	6	157.723	155.870	1.403	Open Manhole	1350
3.000	24.008	400.1	6	157.723	155.940	1.333	Open Manhole	1350
2.002	75.000	38.0	7	155.881	153.896	1.535	Open Manhole	2100
1.002	22.000	500.0	8	156.069	153.252	1.767	Open Manhole	2100
1.003	70.000	197.7	18	155.778	152.898	1.830	Open Manhole	2100
4.000	65.000	100.0	10	156.147	155.383	0.614	Open Manhole	600
4.001	90.000	170.1	11	156.360	154.779	1.356	Open Manhole	1200
4.002	11.498	169.1	14	156.085	154.711	1.149	Open Manhole	1200
5.000	57.000	100.0	13	156.300	155.573	0.577	Open Manhole	600
5.001	90.000	168.2	14	156.085	154.963	0.897	Open Manhole	1200
4.003	18.451	188.3	17	155.778	154.538	0.940	Open Manhole	1200

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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)
6.000	o	100	15	158.103	155.751	2.252	Open Manhole	600
6.001	o	150	16	156.525	155.028	1.347	Open Manhole	600
4.004	o	300	17	155.778	153.969	1.509	Open Manhole	1200
1.004	o	1050	18	155.778	152.898	1.830	Open Manhole	2100
1.005	o	1050	19	155.793	152.764	1.979	Open Manhole	2100
7.000	o	1050	20	155.096	152.500	1.546	Open Manhole	2400
1.006	o	1050	21	155.570	152.462	2.058	Open Manhole	2100
8.000	o	1050	22	155.863	153.250	1.563	Open Manhole	2100
8.001	o	1050	23	155.747	153.220	1.477	Open Manhole	2100
8.002	o	1050	24	155.897	153.176	1.671	Open Manhole	2100
8.003	o	1050	25	155.747	152.996	1.701	Open Manhole	2100
9.000	o	1050	26	155.719	153.500	1.169	Open Manhole	1950
9.001	o	1050	27	155.747	153.444	1.253	Open Manhole	1950

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)
6.000	65.000	96.6	16	156.525	155.078	1.347	Open Manhole	600
6.001	90.000	99.0	17	155.778	154.119	1.509	Open Manhole	1200
4.004	25.848	80.5	18	155.778	153.648	1.830	Open Manhole	2100
1.004	67.000	500.0	19	155.793	152.764	1.979	Open Manhole	2100
1.005	24.000	500.0	21	155.570	152.716	1.804	Open Manhole	2100
7.000	19.000	500.0	21	155.570	152.462	2.058	Open Manhole	2100
1.006	32.598	138.7	38	155.500	152.227	2.223	Open Manhole	2100
8.000	15.000	500.0	23	155.747	153.220	1.477	Open Manhole	2100
8.001	22.000	500.0	24	155.897	153.176	1.671	Open Manhole	2100
8.002	90.000	500.0	25	155.747	152.996	1.701	Open Manhole	2100
8.003	50.000	500.0	37	155.918	152.896	1.972	Open Manhole	2100
9.000	27.817	496.7	27	155.747	153.444	1.253	Open Manhole	1950
9.001	70.000	500.0	29	155.724	153.304	1.370	Open Manhole	1950

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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)
10.000	o	1050	28	155.689	153.355	1.284	Open Manhole	1950
9.002	o	1050	29	155.724	153.304	1.370	Open Manhole	1950
11.000	o	1050	30	155.741	153.282	1.409	Open Manhole	1950
9.003	o	1050	31	155.369	153.224	1.095	Open Manhole	1950
9.004	o	1050	32	155.387	153.131	1.206	Open Manhole	1950
9.005	o	1050	33	155.833	153.031	1.752	Open Manhole	1950
9.006	o	1050	34	155.834	152.851	1.933	Open Manhole	1950
9.007	o	1050	35	155.831	152.671	2.110	Open Manhole	1950
9.008	o	1050	36	155.904	152.510	2.344	Open Manhole	2100
8.004	o	1050	37	155.918	152.470	2.398	Open Manhole	2100
1.007	o	1050	38	155.500	152.227	2.223	Open Manhole	2100
12.000	o	1050	39	155.629	153.832	0.747	Open Manhole	2100
13.000	o	1050	40	156.961	154.000	1.911	Open Manhole	2100
13.001	o	1050	41	156.980	153.920	2.010	Open Manhole	2100

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)
10.000	25.649	502.9	29	155.724	153.304	1.370	Open Manhole	1950
9.002	29.923	500.0	31	155.369	153.244	1.075	Open Manhole	1950
11.000	29.014	500.2	31	155.369	153.224	1.095	Open Manhole	1950
9.003	46.356	500.0	32	155.387	153.131	1.206	Open Manhole	1950
9.004	49.934	500.0	33	155.833	153.031	1.752	Open Manhole	1950
9.005	90.000	500.0	34	155.834	152.851	1.933	Open Manhole	1950
9.006	90.000	500.0	35	155.831	152.671	2.110	Open Manhole	1950
9.007	80.470	500.0	36	155.904	152.510	2.344	Open Manhole	2100
9.008	20.000	500.0	37	155.918	152.470	2.398	Open Manhole	2100
8.004	51.000	209.1	38	155.500	152.227	2.223	Open Manhole	2100
1.007	3.874	500.0	50	155.500	152.219	2.231	Open Manhole	2400
12.000	90.000	500.0	42	154.952	153.652	0.250	Open Manhole	2100
13.000	40.000	500.0	41	156.980	153.920	2.010	Open Manhole	2100
13.001	70.000	261.2	42	154.952	153.652	0.250	Open Manhole	2100

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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)
12.001	o	1050	42	154.952	153.652	0.250	Open Manhole	2100
12.002	o	1050	43	155.369	153.472	0.847	Open Manhole	2100
12.003	o	1050	44	154.988	153.292	0.646	Open Manhole	2400
12.004	o	1050	headwall	155.000	153.072	0.878	Open Manhole	2400
12.005	o	1050	headwall	155.000	153.000	0.950	Open Manhole	2400
12.006	o	1050	45	155.187	152.786	1.351	Open Manhole	2400
14.000	o	300	46	159.596	158.200	1.096	Open Manhole	1200
14.001	o	300	47	158.294	156.747	1.247	Open Manhole	1200
14.002	o	450	48	157.300	155.450	1.400	Open Manhole	1350
14.003	o	450	49	156.592	154.742	1.400	Open Manhole	1350
1.008	o	300	50	155.500	152.219	2.981	Open Manhole	2400

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)
12.001	90.000	500.0	43	155.369	153.472	0.847	Open Manhole	2100
12.002	90.000	500.0	44	154.988	153.292	0.646	Open Manhole	2400
12.003	60.000	272.7	headwall	155.000	153.072	0.878	Open Manhole	2400
12.004	72.464	1006.4	headwall	155.000	153.000	0.950	Open Manhole	2400
12.005	107.000	500.0	45	155.187	152.786	1.351	Open Manhole	2400
12.006	36.000	500.0	50	155.500	152.714	1.736	Open Manhole	2400
14.000	85.000	58.5	47	158.294	156.747	1.247	Open Manhole	1200
14.001	60.000	52.3	48	157.300	155.600	1.400	Open Manhole	1350
14.002	74.000	104.5	49	156.592	154.742	1.400	Open Manhole	1350
14.003	69.067	92.1	50	155.500	153.992	1.058	Open Manhole	2400
1.008	23.772	7.7		150.220	149.132	0.788	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)
1.008		150.220	149.132	0.000	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 * 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	12
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)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 50, DS/PN: 1.008, Volume (m³): 56.0

Unit Reference	MD-SHE-0286-5490-2500-5490
Design Head (m)	2.500
Design Flow (l/s)	54.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	286
Invert Level (m)	152.219
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.500	54.9
Flush-Flo™	0.738	54.9
Kick-Flo®	1.592	44.1
Mean Flow over Head Range	-	47.6

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	8.9	1.200	52.5	3.000	59.9	7.000	90.4
0.200	29.5	1.400	49.6	3.500	64.5	7.500	93.5
0.300	48.2	1.600	44.3	4.000	68.9	8.000	96.5
0.400	51.5	1.800	46.8	4.500	72.9	8.500	99.3
0.500	53.4	2.000	49.3	5.000	76.7	9.000	102.2
0.600	54.4	2.200	51.6	5.500	80.4	9.500	104.9
0.800	54.8	2.400	53.8	6.000	83.8		
1.000	54.0	2.600	55.9	6.500	87.2		

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Storage Structures for Storm

Porous Car Park Manhole: 9, DS/PN: 4.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	60.0
Max Percolation (l/s)	83.3	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	157.400	Membrane Depth (mm)	120

Porous Car Park Manhole: 10, DS/PN: 4.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	90.0
Max Percolation (l/s)	125.0	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	155.308	Membrane Depth (mm)	120

Porous Car Park Manhole: 12, DS/PN: 5.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	57.0
Max Percolation (l/s)	158.3	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	156.143	Membrane Depth (mm)	120

Porous Car Park Manhole: 13, DS/PN: 5.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	90.0
Max Percolation (l/s)	250.0	Slope (1:X)	120.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	155.498	Membrane Depth (mm)	120

Porous Car Park Manhole: 15, DS/PN: 6.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	57.0
Max Percolation (l/s)	79.2	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	155.751	Membrane Depth (mm)	110

Porous Car Park Manhole: 16, DS/PN: 6.001

Infiltration Coefficient Base (m/hr)	0.00000	Max Percolation (l/s)	125.0
Membrane Percolation (mm/hr)	1000	Safety Factor	2.0

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Porous Car Park Manhole: 16, DS/PN: 6.001

Porosity	0.30	Slope (1:X)	500.0
Invert Level (m)	155.078	Depression Storage (mm)	5
Width (m)	5.0	Evaporation (mm/day)	3
Length (m)	90.0	Membrane Depth (mm)	110

Cellular Storage Manhole: 20, DS/PN: 7.000

Invert Level (m) 152.500 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	280.0	280.0	1.501	0.0	380.4
1.500	280.0	380.4			

Cellular Storage Manhole: 38, DS/PN: 1.007

Invert Level (m) 152.227 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	1075.0	1075.0	1.501	0.0	1271.8
1.500	1075.0	1271.7			

Cellular Storage Manhole: 44, DS/PN: 12.003

Invert Level (m) 153.262 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	1600.0	1600.0	0.851	0.0	1736.1
0.850	1600.0	1736.0			

Tank or Pond Manhole: headwall, DS/PN: 12.005

Invert Level (m) 153.168

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	75.6	1.850	689.3

Cellular Storage Manhole: 45, DS/PN: 12.006

Invert Level (m) 152.786 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

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Cellular Storage Manhole: 45, DS/PN: 12.006

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	2400.0	2400.0	1.251	0.0	2645.0
1.250	2400.0	2644.9			

Cellular Storage Manhole: 50, DS/PN: 1.008

Invert Level (m) 152.219 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	160.0	160.0	1.001	0.0	210.6
1.000	160.0	210.6			

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Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	1	7.713	76.113	0.000	83.826
1.001	2	8.316	76.113	0.000	84.429
2.000	3	2.710	3.602	0.000	6.312
2.001	4	2.556	4.238	0.000	6.795
3.000	5	2.684	3.604	0.000	6.287
2.002	6	2.652	11.654	0.000	14.306
1.002	7	8.952	17.231	0.000	26.184
1.003	8	9.756	58.795	0.000	68.551
4.000	9	0.556	1.138	43.200	44.894
4.001	10	0.237	3.543	95.715	99.495
4.002	11	1.788	0.409	0.000	2.198
5.000	12	0.567	0.997	322.677	324.241
5.001	13	0.227	3.543	112.698	116.467
4.003	14	1.639	1.219	0.000	2.858
6.000	15	0.665	0.506	191.685	192.856
6.001	16	0.423	1.575	178.657	180.655
4.004	17	2.046	1.710	0.000	3.756
1.004	18	9.975	56.197	0.000	66.172
1.005	19	10.491	18.963	0.000	29.455
7.000	20	11.744	14.504	399.089	425.337
1.006	21	10.765	26.408	0.000	37.173
8.000	22	9.050	11.170	0.000	20.221
8.001	23	8.753	17.231	0.000	25.984
8.002	24	9.424	76.113	0.000	85.537
8.003	25	9.528	41.477	0.000	51.005
9.000	26	6.627	22.398	0.000	29.025
9.001	27	6.878	58.925	0.000	65.802
10.000	28	6.970	20.521	0.000	27.491
9.002	29	7.227	24.222	0.000	31.449
11.000	30	7.344	23.435	0.000	30.779
9.003	31	6.406	38.451	0.000	44.857
9.004	32	6.737	41.549	0.000	48.286
9.005	33	8.367	76.243	0.000	84.609
9.006	34	8.907	76.243	0.000	85.150
9.007	35	9.436	67.926	0.000	77.362
9.008	36	11.754	15.500	0.000	27.253
8.004	37	11.941	42.343	0.000	54.283
1.007	38	11.338	1.406	1532.215	1544.960
12.000	39	6.224	76.113	0.000	82.337
13.000	40	10.256	32.818	0.000	43.073
13.001	41	10.599	58.795	0.000	69.393
12.001	42	4.503	76.113	0.000	80.615
12.002	43	6.570	75.983	0.000	82.553
12.003	44	7.673	49.876	1292.507	1350.055
12.004	headwall	8.722	60.669	0.000	69.391
12.005	headwall	9.048	90.573	600.133	699.754
12.006	45	10.862	29.094	2850.760	2890.716
14.000	46	1.579	5.923	0.000	7.502

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Volume Summary (Static)

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
14.001	47	1.750	4.151	0.000	5.901
14.002	48	2.648	11.554	0.000	14.203
14.003	49	2.648	10.686	0.000	13.334
1.008	50	14.843	1.596	152.051	168.489
Total		341.075	1621.157	7771.387	9733.619

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1 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 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 12
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS 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) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	1	+0%	100/15 Summer				153.936
1.001	2	15 Winter	1	+0%	100/15 Summer				153.866
2.000	3	15 Winter	1	+0%					156.128
2.001	4	15 Winter	1	+0%					156.063
3.000	5	15 Winter	1	+0%					156.053
2.002	6	15 Winter	1	+0%					155.950
1.002	7	15 Winter	1	+0%	100/15 Summer				153.745
1.003	8	15 Winter	1	+0%	100/15 Winter				153.544
4.000	9	15 Winter	1	+0%	30/15 Summer				156.141
4.001	10	30 Winter	1	+0%	100/15 Summer				155.407
4.002	11	30 Winter	1	+0%	30/15 Summer				154.899
5.000	12	30 Winter	1	+0%	100/15 Summer				156.209
5.001	13	30 Winter	1	+0%	100/15 Summer				155.603
4.003	14	30 Winter	1	+0%	30/15 Summer				154.789
6.000	15	30 Winter	1	+0%	100/15 Summer				155.796
6.001	16	30 Winter	1	+0%	100/15 Summer				155.092
4.004	17	30 Winter	1	+0%	100/15 Summer				154.102
1.004	18	15 Winter	1	+0%	100/15 Summer				153.342
1.005	19	15 Winter	1	+0%	100/15 Summer				153.214

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.779	0.000	0.10			114.8	OK	
1.001	2	-0.669	0.000	0.22			257.5	OK	
2.000	3	-0.322	0.000	0.16			21.4	OK	
2.001	4	-0.327	0.000	0.16			22.4	OK	
3.000	5	-0.397	0.000	0.03			4.4	OK	
2.002	6	-0.370	0.000	0.07			35.7	OK	
1.002	7	-0.601	0.000	0.38			306.5	OK	
1.003	8	-0.758	0.000	0.17			303.5	OK	
4.000	9	-0.042	0.000	0.87		5	15.1	OK	
4.001	10	-0.126	0.000	0.39		9	15.1	OK	
4.002	11	-0.105	0.000	0.55			18.6	OK	
5.000	12	-0.084	0.000	0.39		13	6.8	OK	
5.001	13	-0.120	0.000	0.44		9	17.3	OK	
4.003	14	-0.147	0.000	0.51			35.7	OK	
6.000	15	-0.055	0.000	0.40		10	2.5	OK	
6.001	16	-0.086	0.000	0.38		5	6.7	OK	
4.004	17	-0.167	0.000	0.41			45.2	OK	
1.004	18	-0.606	0.000	0.30			331.8	OK	
1.005	19	-0.600	0.000	0.38			332.0	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.000	20	360 Winter	1	+0%	100/30 Summer			
1.006	21	360 Winter	1	+0%	100/30 Summer			
8.000	22	15 Winter	1	+0%	100/180 Winter			
8.001	23	15 Winter	1	+0%	100/180 Winter			
8.002	24	15 Winter	1	+0%	100/120 Winter			
8.003	25	15 Winter	1	+0%	100/60 Winter			
9.000	26	15 Winter	1	+0%	100/120 Winter			
9.001	27	15 Winter	1	+0%	100/120 Winter			
10.000	28	15 Winter	1	+0%	100/120 Winter			
9.002	29	15 Winter	1	+0%	100/120 Winter			
11.000	30	15 Winter	1	+0%	100/120 Winter			
9.003	31	15 Winter	1	+0%	100/120 Winter			
9.004	32	15 Winter	1	+0%	100/120 Winter			
9.005	33	15 Winter	1	+0%	100/120 Winter			
9.006	34	15 Winter	1	+0%	100/60 Winter			
9.007	35	15 Winter	1	+0%	100/60 Winter			
9.008	36	360 Winter	1	+0%	100/30 Winter			
8.004	37	360 Winter	1	+0%	100/30 Summer			
1.007	38	360 Winter	1	+0%	30/120 Winter			
12.000	39	15 Winter	1	+0%				
13.000	40	15 Winter	1	+0%				
13.001	41	15 Winter	1	+0%				
12.001	42	15 Winter	1	+0%				
12.002	43	15 Winter	1	+0%				
12.003	44	120 Winter	1	+0%	100/720 Winter			
12.004	headwall	120 Winter	1	+0%	100/480 Winter			
12.005	headwall	120 Winter	1	+0%	100/360 Winter			
12.006	45	360 Winter	1	+0%	100/180 Winter			
14.000	46	15 Winter	1	+0%				
14.001	47	15 Winter	1	+0%	100/15 Summer			
14.002	48	15 Winter	1	+0%				
14.003	49	15 Winter	1	+0%	100/15 Summer			
1.008	50	360 Winter	1	+0%	1/15 Summer			

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
7.000	20	152.888	-0.662	0.000	0.01		246	6.3	OK
1.006	21	152.889	-0.623	0.000	0.05			77.4	OK
8.000	22	153.450	-0.850	0.000	0.08			48.5	OK
8.001	23	153.397	-0.873	0.000	0.06			46.5	OK
8.002	24	153.343	-0.883	0.000	0.04			42.9	OK
8.003	25	153.269	-0.777	0.000	0.15			160.1	OK
9.000	26	153.676	-0.874	0.000	0.05			45.5	OK
9.001	27	153.625	-0.869	0.000	0.04			41.3	OK
10.000	28	153.601	-0.804	0.000	0.08			74.7	OK

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

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
9.002	29	153.573	-0.781	0.000	0.10			98.0	OK
11.000	30	153.548	-0.784	0.000	0.09			79.2	OK
9.003	31	153.523	-0.751	0.000	0.15			155.8	OK
9.004	32	153.421	-0.760	0.000	0.14			149.0	OK
9.005	33	153.307	-0.774	0.000	0.15			169.8	OK
9.006	34	153.123	-0.779	0.000	0.14			157.6	OK
9.007	35	152.960	-0.762	0.000	0.13			150.2	OK
9.008	36	152.891	-0.670	0.000	0.06			42.3	OK
8.004	37	152.888	-0.632	0.000	0.05			72.3	OK
1.007	38	152.883	-0.394	0.000	0.07		324	51.9	OK
12.000	39	154.127	-0.755	0.000	0.15			170.8	OK
13.000	40	154.085	-0.965	0.000	0.01			8.8	OK
13.001	41	154.050	-0.920	0.000	0.02			34.1	OK
12.001	42	153.981	-0.721	0.000	0.19			222.1	OK
12.002	43	153.818	-0.704	0.000	0.24			272.1	OK
12.003	44	153.450	-0.892	0.000	0.05		100	69.8	OK
12.004	headwall	153.295	-0.827	0.000	0.09			69.5	OK
12.005	headwall	153.165	-0.885	0.000	0.06			69.6	OK
12.006	45	152.919	-0.917	0.000	0.03		246	25.8	OK
14.000	46	158.286	-0.214	0.000	0.18			24.9	OK
14.001	47	156.850	-0.197	0.000	0.25			37.2	OK
14.002	48	155.578	-0.322	0.000	0.18			52.0	OK
14.003	49	154.886	-0.306	0.000	0.22			69.6	OK
1.008	50	152.880	0.361	0.000	0.15		330	54.7	SURCHARGED

PN	US/MH Name	Level Exceeded
7.000	20	
1.006	21	
8.000	22	
8.001	23	
8.002	24	
8.003	25	
9.000	26	
9.001	27	
10.000	28	
9.002	29	
11.000	30	
9.003	31	
9.004	32	
9.005	33	
9.006	34	
9.007	35	
9.008	36	
8.004	37	

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

PN	US/MH Name	Level Exceeded
1.007	38	
12.000	39	
13.000	40	
13.001	41	
12.001	42	
12.002	43	
12.003	44	
12.004	headwall	
12.005	headwall	
12.006	45	
14.000	46	
14.001	47	
14.002	48	
14.003	49	
1.008	50	

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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 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 12
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS 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) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	30	+0%	100/15 Summer				154.242
1.001	2	15 Winter	30	+0%	100/15 Summer				154.193
2.000	3	15 Winter	30	+0%					156.208
2.001	4	15 Winter	30	+0%					156.143
3.000	5	15 Winter	30	+0%					156.085
2.002	6	15 Winter	30	+0%					156.003
1.002	7	15 Winter	30	+0%	100/15 Summer				154.100
1.003	8	15 Winter	30	+0%	100/15 Winter				153.789
4.000	9	15 Winter	30	+0%	30/15 Summer				157.448
4.001	10	15 Winter	30	+0%	100/15 Summer				155.486
4.002	11	30 Winter	30	+0%	30/15 Summer				155.065
5.000	12	30 Winter	30	+0%	100/15 Summer				156.259
5.001	13	15 Winter	30	+0%	100/15 Summer				155.702
4.003	14	30 Winter	30	+0%	30/15 Summer				154.958
6.000	15	30 Winter	30	+0%	100/15 Summer				155.838
6.001	16	15 Winter	30	+0%	100/15 Summer				155.144
4.004	17	30 Winter	30	+0%	100/15 Summer				154.200
1.004	18	15 Winter	30	+0%	100/15 Summer				153.681
1.005	19	15 Winter	30	+0%	100/15 Summer				153.556

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.473	0.000	0.24			279.4	OK	
1.001	2	-0.342	0.000	0.55			630.8	OK	
2.000	3	-0.242	0.000	0.39			52.7	OK	
2.001	4	-0.247	0.000	0.41			56.2	OK	
3.000	5	-0.365	0.000	0.08			10.7	OK	
2.002	6	-0.317	0.000	0.19			92.7	OK	
1.002	7	-0.247	0.000	0.93			754.4	OK	
1.003	8	-0.513	0.000	0.42			738.1	OK	
4.000	9	1.265	0.000	1.71		3	29.7	SURCHARGED	
4.001	10	-0.047	0.000	0.90		6	35.1	OK	
4.002	11	0.061	0.000	1.25			42.5	SURCHARGED	
5.000	12	-0.034	0.000	0.95		12	16.5	OK	
5.001	13	-0.021	0.000	1.00		7	39.0	OK	
4.003	14	0.022	0.000	1.17			81.5	SURCHARGED	
6.000	15	-0.013	0.000	1.00		11	6.1	OK	
6.001	16	-0.034	0.000	0.91		5	16.1	OK	
4.004	17	-0.069	0.000	0.94			104.9	OK	
1.004	18	-0.267	0.000	0.73			799.6	OK	
1.005	19	-0.258	0.000	0.92			795.3	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.000	20	480 Winter	30	+0%	100/30 Summer			
1.006	21	480 Winter	30	+0%	100/30 Summer			
8.000	22	15 Winter	30	+0%	100/180 Winter			
8.001	23	15 Winter	30	+0%	100/180 Winter			
8.002	24	360 Winter	30	+0%	100/120 Winter			
8.003	25	360 Winter	30	+0%	100/60 Winter			
9.000	26	15 Winter	30	+0%	100/120 Winter			
9.001	27	15 Winter	30	+0%	100/120 Winter			
10.000	28	15 Winter	30	+0%	100/120 Winter			
9.002	29	15 Winter	30	+0%	100/120 Winter			
11.000	30	15 Winter	30	+0%	100/120 Winter			
9.003	31	15 Winter	30	+0%	100/120 Winter			
9.004	32	15 Winter	30	+0%	100/120 Winter			
9.005	33	360 Winter	30	+0%	100/120 Winter			
9.006	34	360 Winter	30	+0%	100/60 Winter			
9.007	35	360 Winter	30	+0%	100/60 Winter			
9.008	36	360 Winter	30	+0%	100/30 Winter			
8.004	37	360 Winter	30	+0%	100/30 Summer			
1.007	38	480 Winter	30	+0%	30/120 Winter			
12.000	39	15 Winter	30	+0%				
13.000	40	15 Winter	30	+0%				
13.001	41	15 Winter	30	+0%				
12.001	42	15 Winter	30	+0%				
12.002	43	15 Winter	30	+0%				
12.003	44	60 Winter	30	+0%	100/720 Winter			
12.004	headwall	60 Winter	30	+0%	100/480 Winter			
12.005	headwall	600 Winter	30	+0%	100/360 Winter			
12.006	45	600 Winter	30	+0%	100/180 Winter			
14.000	46	15 Winter	30	+0%				
14.001	47	15 Winter	30	+0%	100/15 Summer			
14.002	48	15 Winter	30	+0%				
14.003	49	15 Winter	30	+0%	100/15 Summer			
1.008	50	480 Winter	30	+0%	1/15 Summer			

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
7.000	20	153.487	-0.063	0.000	0.01		712	8.8	OK
1.006	21	153.486	-0.026	0.000	0.08			125.0	OK
8.000	22	153.573	-0.727	0.000	0.20			119.1	OK
8.001	23	153.526	-0.744	0.000	0.14			112.5	OK
8.002	24	153.491	-0.735	0.000	0.01			15.1	OK
8.003	25	153.491	-0.555	0.000	0.06			64.6	OK
9.000	26	153.806	-0.744	0.000	0.12			111.5	OK
9.001	27	153.777	-0.717	0.000	0.09			96.4	OK
10.000	28	153.771	-0.634	0.000	0.20			183.5	OK

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

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
9.002	29	153.747	-0.607	0.000	0.25			234.6	OK
11.000	30	153.725	-0.607	0.000	0.21			194.8	OK
9.003	31	153.702	-0.572	0.000	0.37			378.6	OK
9.004	32	153.597	-0.585	0.000	0.35			365.5	OK
9.005	33	153.563	-0.519	0.000	0.07			76.9	OK
9.006	34	153.549	-0.352	0.000	0.06			68.5	OK
9.007	35	153.535	-0.186	0.000	0.05			56.9	OK
9.008	36	153.517	-0.044	0.000	0.08			60.5	OK
8.004	37	153.487	-0.033	0.000	0.08			117.4	OK
1.007	38	153.422	0.145	0.000	0.21		864	147.4	SURCHARGED
12.000	39	154.332	-0.550	0.000	0.36			418.8	OK
13.000	40	154.248	-0.802	0.000	0.02			20.8	OK
13.001	41	154.245	-0.725	0.000	0.05			82.9	OK
12.001	42	154.208	-0.494	0.000	0.49			561.4	OK
12.002	43	154.055	-0.467	0.000	0.58			668.1	OK
12.003	44	153.614	-0.728	0.000	0.17		52	246.9	OK
12.004	headwall	153.479	-0.643	0.000	0.31			243.6	OK
12.005	headwall	153.418	-0.632	0.000	0.08			95.0	OK
12.006	45	153.411	-0.425	0.000	0.04		540	41.1	OK
14.000	46	158.340	-0.160	0.000	0.44			61.2	OK
14.001	47	156.930	-0.117	0.000	0.66			96.2	OK
14.002	48	155.675	-0.225	0.000	0.48			141.3	OK
14.003	49	155.001	-0.191	0.000	0.62			194.0	OK
1.008	50	153.429	0.910	0.000	0.15		896	54.9	SURCHARGED

PN	US/MH Name	Level Exceeded
7.000	20	
1.006	21	
8.000	22	
8.001	23	
8.002	24	
8.003	25	
9.000	26	
9.001	27	
10.000	28	
9.002	29	
11.000	30	
9.003	31	
9.004	32	
9.005	33	
9.006	34	
9.007	35	
9.008	36	
8.004	37	

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

PN	US/MH Name	Level Exceeded
1.007	38	
12.000	39	
13.000	40	
13.001	41	
12.001	42	
12.002	43	
12.003	44	
12.004	headwall	
12.005	headwall	
12.006	45	
14.000	46	
14.001	47	
14.002	48	
14.003	49	
1.008	50	

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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 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 12
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS 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) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	180 Winter	100	+40%	100/15 Summer				155.387
1.001	2	180 Winter	100	+40%	100/15 Summer				155.235
2.000	3	15 Winter	100	+40%					156.303
2.001	4	15 Winter	100	+40%					156.236
3.000	5	15 Winter	100	+40%					156.120
2.002	6	15 Winter	100	+40%					156.054
1.002	7	180 Winter	100	+40%	100/15 Summer				155.102
1.003	8	180 Winter	100	+40%	100/15 Winter				155.057
4.000	9	15 Winter	100	+40%	30/15 Summer				157.558
4.001	10	30 Winter	100	+40%	100/15 Summer				155.610
4.002	11	15 Winter	100	+40%	30/15 Summer				155.214
5.000	12	30 Winter	100	+40%	100/15 Summer				156.346
5.001	13	30 Winter	100	+40%	100/15 Summer				155.851
4.003	14	15 Winter	100	+40%	30/15 Summer				155.018
6.000	15	30 Winter	100	+40%	100/15 Summer				155.900
6.001	16	30 Winter	100	+40%	100/15 Summer				155.214
4.004	17	480 Winter	100	+40%	100/15 Summer				154.856
1.004	18	180 Winter	100	+40%	100/15 Summer				155.048
1.005	19	180 Winter	100	+40%	100/15 Summer				154.853

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.672	0.000	0.11			122.0	SURCHARGED	
1.001	2	0.700	0.000	0.31			353.0	SURCHARGED	
2.000	3	-0.147	0.000	0.72			95.9	OK	
2.001	4	-0.154	0.000	0.75			102.2	OK	
3.000	5	-0.330	0.000	0.15			19.4	OK	
2.002	6	-0.266	0.000	0.34			168.2	OK	
1.002	7	0.756	0.000	0.54			436.8	SURCHARGED	
1.003	8	0.755	0.000	0.25			433.7	SURCHARGED	
4.000	9	1.375	0.000	1.75		7	30.5	SURCHARGED	
4.001	10	0.077	0.000	1.00		11	38.6	SURCHARGED	
4.002	11	0.210	0.000	1.66			56.3	SURCHARGED	
5.000	12	0.053	0.000	1.00		19	17.4	SURCHARGED	
5.001	13	0.128	0.000	1.12		13	43.7	SURCHARGED	
4.003	14	0.082	0.000	1.41			98.1	SURCHARGED	
6.000	15	0.049	0.000	1.02		17	6.2	SURCHARGED	
6.001	16	0.036	0.000	1.01		10	17.8	SURCHARGED	
4.004	17	0.587	0.000	0.39			43.7	SURCHARGED	
1.004	18	1.100	0.000	0.48			527.0	SURCHARGED	
1.005	19	1.039	0.000	0.62			534.0	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.000	20	360 Winter	100	+40%	100/30 Summer			
1.006	21	240 Winter	100	+40%	100/30 Summer			
8.000	22	180 Winter	100	+40%	100/180 Winter			
8.001	23	180 Winter	100	+40%	100/180 Winter			
8.002	24	180 Winter	100	+40%	100/120 Winter			
8.003	25	180 Winter	100	+40%	100/60 Winter			
9.000	26	180 Winter	100	+40%	100/120 Winter			
9.001	27	180 Winter	100	+40%	100/120 Winter			
10.000	28	180 Winter	100	+40%	100/120 Winter			
9.002	29	180 Winter	100	+40%	100/120 Winter			
11.000	30	180 Winter	100	+40%	100/120 Winter			
9.003	31	180 Winter	100	+40%	100/120 Winter			
9.004	32	180 Winter	100	+40%	100/120 Winter			
9.005	33	180 Winter	100	+40%	100/120 Winter			
9.006	34	180 Winter	100	+40%	100/60 Winter			
9.007	35	180 Winter	100	+40%	100/60 Winter			
9.008	36	180 Winter	100	+40%	100/30 Winter			
8.004	37	180 Winter	100	+40%	100/30 Summer			
1.007	38	240 Winter	100	+40%	30/120 Winter			
12.000	39	15 Winter	100	+40%				
13.000	40	15 Winter	100	+40%				
13.001	41	15 Winter	100	+40%				
12.001	42	15 Winter	100	+40%				
12.002	43	720 Winter	100	+40%				
12.003	44	720 Winter	100	+40%	100/720 Winter			
12.004	headwall	720 Winter	100	+40%	100/480 Winter			
12.005	headwall	720 Winter	100	+40%	100/360 Winter			
12.006	45	720 Winter	100	+40%	100/180 Winter			
14.000	46	15 Winter	100	+40%				
14.001	47	15 Winter	100	+40%	100/15 Summer			
14.002	48	15 Winter	100	+40%				
14.003	49	15 Winter	100	+40%	100/15 Summer			
1.008	50	180 Winter	100	+40%	1/15 Summer			

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
7.000	20	154.592	1.042	0.000	0.02		1686	15.3	SURCHARGED
1.006	21	154.649	1.137	0.000	0.30			451.1	SURCHARGED
8.000	22	154.819	0.519	0.000	0.08			46.5	SURCHARGED
8.001	23	154.816	0.546	0.000	0.05			44.0	SURCHARGED
8.002	24	154.823	0.597	0.000	0.04			42.8	SURCHARGED
8.003	25	154.842	0.796	0.000	0.17			180.8	SURCHARGED
9.000	26	155.115	0.565	0.000	0.05			44.6	SURCHARGED
9.001	27	155.108	0.614	0.000	0.04			42.7	SURCHARGED
10.000	28	155.119	0.714	0.000	0.08			73.3	SURCHARGED

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

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
9.002	29	155.110	0.756	0.000	0.11			105.6	SURCHARGED
11.000	30	155.130	0.798	0.000	0.08			77.6	SURCHARGED
9.003	31	155.116	0.842	0.000	0.17			173.8	FLOOD RISK
9.004	32	155.127	0.946	0.000	0.16			164.6	FLOOD RISK
9.005	33	155.127	1.046	0.000	0.17			196.2	SURCHARGED
9.006	34	155.099	1.197	0.000	0.14			156.2	SURCHARGED
9.007	35	155.039	1.318	0.000	0.10			113.9	SURCHARGED
9.008	36	154.927	1.366	0.000	0.19			145.0	SURCHARGED
8.004	37	154.715	1.194	0.000	0.18			269.4	SURCHARGED
1.007	38	154.748	1.471	0.000	0.57		1908	408.1	SURCHARGED
12.000	39	154.583	-0.299	0.000	0.66			761.0	OK
13.000	40	154.576	-0.474	0.000	0.03			35.0	OK
13.001	41	154.555	-0.415	0.000	0.08			122.5	OK
12.001	42	154.494	-0.208	0.000	0.86			982.7	OK
12.002	43	154.380	-0.142	0.000	0.11			126.1	OK
12.003	44	154.372	0.030	0.000	0.10		1008	146.8	SURCHARGED
12.004	headwall	154.372	0.250	0.000	0.18			144.9	SURCHARGED
12.005	headwall	154.372	0.322	0.000	0.11			134.0	SURCHARGED
12.006	45	154.412	0.576	0.000	0.04		1524	41.4	SURCHARGED
14.000	46	158.406	-0.094	0.000	0.79			111.4	OK
14.001	47	157.402	0.355	0.000	1.14			166.4	SURCHARGED
14.002	48	155.770	-0.130	0.000	0.82			243.2	OK
14.003	49	155.226	0.034	0.000	1.03			323.5	SURCHARGED
1.008	50	154.492	1.973	0.000	0.15		1914	54.9	SURCHARGED

PN	US/MH Name	Level Exceeded
7.000	20	
1.006	21	
8.000	22	
8.001	23	
8.002	24	
8.003	25	
9.000	26	
9.001	27	
10.000	28	
9.002	29	
11.000	30	
9.003	31	
9.004	32	
9.005	33	
9.006	34	
9.007	35	
9.008	36	
8.004	37	

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

PN	US/MH Name	Level Exceeded
1.007	38	
12.000	39	
13.000	40	
13.001	41	
12.001	42	
12.002	43	
12.003	44	
12.004	headwall	
12.005	headwall	
12.006	45	
14.000	46	
14.001	47	
14.002	48	
14.003	49	
1.008	50	

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