


Woods Hardwick		Page 1
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 08/04/2021 15:44 File SW PH9 Proposed	Designed by a.tew Checked by	
XP Solutions		Network 2014.1.1

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD






FEH Rainfall Model

Return Period (years)	2
Site Location GB 450500 225250 SP 50500 25250	
C (1km)	-0.023
D1 (1km)	0.328
D2 (1km)	0.309
D3 (1km)	0.264
E (1km)	0.292
F (1km)	2.461
Maximum Rainfall (mm/hr)	0
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
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 length does not match coordinates















PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1.000	9.050	0.650	13.9	0.026	5.00	0.0	0.600	\	-1	
1.001	9.000	0.500	18.0	0.016	0.00	0.0	0.600	\	-1	
1.002	7.527	0.250	30.1	0.024	0.00	0.0	0.600	\	-1	
1.003	12.654	0.287	44.1	0.000	0.00	0.0	0.600	o	150	
1.004	45.169	0.115	392.8	0.053	0.00	0.0	0.600	o	450	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	0.00	5.01	123.850	0.026	0.0	0.0	0.0	14.05	50669.7	0.0
1.001	0.00	5.02	123.200	0.042	0.0	0.0	0.0	12.36	44557.7	0.0
1.002	0.00	5.04	122.700	0.066	0.0	0.0	0.0	9.55	34441.1	0.0
1.003	0.00	5.17	122.450	0.066	0.0	0.0	0.0	1.52	26.9	0.0
1.004	0.00	5.91	121.863	0.119	0.0	0.0	0.0	1.02	162.2	0.0

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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)	Auto Design
2.000	24.880	0.130	191.4	0.076	5.00	0.0	0.600	o	375	
2.001	6.893	0.027	255.3	0.000	0.00	0.0	0.600	o	375	
1.005	28.960	0.050	579.2	0.008	0.00	0.0	0.600	o	600	
3.000	25.800	0.112	230.4	0.028	5.00	0.0	0.600	oo	41	
1.006	10.020	0.017	589.4	0.049	0.00	0.0	0.600	o	600	
1.007	21.048	0.156	134.9	0.000	0.00	0.0	0.600	o	150	
1.008	16.030	0.300	53.4	0.000	0.00	0.0	0.600	o	150	
1.009	71.700	0.910	78.8	0.000	0.00	0.0	0.600	o	225	
4.000	42.980	0.233	184.5	0.500	5.00	0.0	0.600	o	225	
5.000	8.290	0.537	15.4	0.050	5.00	0.0	0.600	o	150	
4.001	7.220	0.030	240.7	0.000	0.00	0.0	0.600	o	300	
4.002	41.565	0.354	117.4	0.020	0.00	0.0	0.600	o	300	
6.000	17.914	0.241	74.3	0.020	5.00	0.0	0.600	o	100	
6.001	47.052	0.866	54.3	0.022	0.00	0.0	0.600	o	150	

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	0.00	5.32	121.980	0.076	0.0	0.0	0.0	1.31	144.3	0.0
2.001	0.00	5.42	121.850	0.076	0.0	0.0	0.0	1.13	124.7	0.0
1.005	0.00	6.39	121.598	0.203	0.0	0.0	0.0	1.00	284.1	0.0
3.000	0.00	5.42	121.660	0.028	0.0	0.0	0.0	1.03	145.2	0.0
1.006	0.00	6.56	121.548	0.280	0.0	0.0	0.0	1.00	281.6	0.0
1.007	0.00	6.97	121.531	0.280	0.0	0.0	0.0	0.86	15.3	0.0
1.008	0.00	7.16	121.375	0.280	0.0	0.0	0.0	1.38	24.4	0.0
1.009	0.00	7.97	121.000	0.280	0.0	0.0	0.0	1.47	58.6	0.0
4.000	0.00	5.75	121.507	0.500	0.0	0.0	0.0	0.96	38.1	0.0
5.000	0.00	5.05	121.961	0.050	0.0	0.0	0.0	2.58	45.5	0.0
4.001	0.00	5.87	121.274	0.550	0.0	0.0	0.0	1.01	71.3	0.0
4.002	0.00	6.34	121.244	0.570	0.0	0.0	0.0	1.45	102.5	0.0
6.000	0.00	5.33	123.132	0.020	0.0	0.0	0.0	0.89	7.0	0.0
6.001	0.00	5.91	122.891	0.042	0.0	0.0	0.0	1.37	24.2	0.0

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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)	Auto Design
6.002	64.199	0.985	65.2	0.000	0.00	0.0	0.600	o	150	
4.003	63.899	0.200	319.5	0.000	0.00	0.0	0.600	o	300	
7.000	128.657	0.762	168.8	0.250	5.00	0.0	0.600	o	300	
7.001	14.690	0.130	113.0	0.020	0.00	0.0	0.600	o	300	
4.004	17.440	0.150	116.3	0.000	0.00	0.0	0.600	oo	42	
4.005	36.660	0.120	305.5	0.000	0.00	0.0	0.600	o	525	
4.006	64.888	0.210	309.0	0.000	0.00	0.0	0.600	o	525	
4.007	49.402	0.160	308.8	0.000	0.00	0.0	0.600	o	525	
8.000	1.000	0.100	10.0	0.000	5.00	0.0	0.600	o	100	
9.000	30.130	0.690	43.7	0.221	5.00	0.0	0.600	o	300	
9.001	14.283	0.250	57.1	0.048	0.00	0.0	0.600	o	375	
9.002	39.587	1.390	28.5	0.055	0.00	0.0	0.600	o	375	
10.000	58.183	0.265	219.6	0.339	5.00	0.0	0.600	o	450	
9.003	43.381	0.280	154.9	0.137	0.00	0.0	0.600	o	525	
9.004	10.311	0.170	60.7	0.000	0.00	0.0	0.600	o	525	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
6.002	0.00	6.77	122.025	0.042	0.0	0.0	0.0	1.25	22.0	0.0
4.003	0.00	7.98	120.890	0.612	0.0	0.0	0.0	0.87	61.8	0.0
7.000	0.00	6.78	121.882	0.250	0.0	0.0	0.0	1.21	85.3	0.0
7.001	0.00	6.94	121.120	0.270	0.0	0.0	0.0	1.48	104.5	0.0
4.004	0.00	8.16	120.690	0.882	0.0	0.0	0.0	1.68	371.3	0.0
4.005	0.00	8.64	120.540	0.882	0.0	0.0	0.0	1.28	276.3	0.0
4.006	0.00	9.49	120.420	0.882	0.0	0.0	0.0	1.27	274.7	0.0
4.007	0.00	10.14	120.210	0.882	0.0	0.0	0.0	1.27	274.8	0.0
8.000	0.00	5.01	120.605	0.000	0.0	0.0	0.0	2.46	19.3	0.0
9.000	0.00	5.21	123.520	0.221	0.0	0.0	0.0	2.39	168.6	0.0
9.001	0.00	5.31	122.755	0.269	0.0	0.0	0.0	2.40	265.2	0.0
9.002	0.00	5.50	122.505	0.324	0.0	0.0	0.0	3.41	376.2	0.0
10.000	0.00	5.71	121.305	0.339	0.0	0.0	0.0	1.37	217.6	0.0
9.003	0.00	6.11	120.965	0.800	0.0	0.0	0.0	1.80	389.0	0.0
9.004	0.00	6.17	120.685	0.800	0.0	0.0	0.0	2.88	623.4	0.0

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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)	Auto Design
8.001	61.528	0.170	361.9	0.151	0.00	0.0	0.600	o	750	
11.000	49.643	0.380	130.6	0.098	5.00	0.0	0.600	o	300	
11.001	29.531	0.150	196.9	0.171	0.00	0.0	0.600	o	450	
11.002	56.417	0.325	173.6	0.314	0.00	0.0	0.600	o	525	
11.003	8.196	0.240	34.2	0.107	0.00	0.0	0.600	o	600	
12.000	24.053	0.555	43.3	0.000	5.00	0.0	0.600	o	750	
8.002	2.406	0.060	40.1	0.000	0.00	0.0	0.600	o	300	
4.008	36.168	0.120	301.4	0.000	0.00	0.0	0.600	o	525	
13.000	24.393	0.110	221.8	0.020	5.00	0.0	0.600	o	450	
13.001	40.256	0.150	268.4	0.067	0.00	0.0	0.600	o	600	
14.000	13.311	0.925	14.4	0.060	5.00	0.0	0.600	o	225	
13.002	8.528	0.145	58.8	0.000	0.00	0.0	0.600	o	150	
4.009	28.200	0.140	201.4	0.000	0.00	0.0	0.600	o	525	

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)
8.001	0.00	6.87	120.505	0.951	0.0	0.0	0.0	1.47	647.3	0.0
11.000	0.00	5.60	121.730	0.098	0.0	0.0	0.0	1.37	97.1	0.0
11.001	0.00	5.94	121.200	0.269	0.0	0.0	0.0	1.45	229.9	0.0
11.002	0.00	6.50	120.975	0.583	0.0	0.0	0.0	1.70	367.4	0.0
11.003	0.00	6.53	120.575	0.690	0.0	0.0	0.0	4.18	1180.9	0.0
12.000	0.00	5.09	120.890	0.000	0.0	0.0	0.0	4.26	1881.1	0.0
8.002	0.00	6.89	120.335	1.641	0.0	0.0	0.0	2.49	176.0	0.0
4.008	0.00	10.61	120.050	2.523	0.0	0.0	0.0	1.28	278.2	0.0
13.000	0.00	5.30	120.860	0.020	0.0	0.0	0.0	1.36	216.5	0.0
13.001	0.00	5.75	120.600	0.087	0.0	0.0	0.0	1.48	418.9	0.0
14.000	0.00	5.06	121.375	0.060	0.0	0.0	0.0	3.47	137.9	0.0
13.002	0.00	5.86	120.450	0.147	0.0	0.0	0.0	1.31	23.2	0.0
4.009	0.00	10.90	119.930	2.670	0.0	0.0	0.0	1.57	340.9	0.0

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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)	Auto Design
1.010	50.410	0.120	420.1	0.000	0.00	0.0	0.600	o	525	
1.011	10.500	0.030	350.0	0.000	0.00	0.0	0.600	o	525	
1.012	37.570	0.090	417.4	0.000	0.00	0.0	0.600	o	525	
1.013	9.819	0.032	305.0	0.000	0.00	0.0	0.600	o	525	
1.014	13.878	0.038	365.2	0.000	0.00	0.0	0.600	o	525	
1.015	42.621	0.510	83.6	0.000	0.00	0.0	0.600	o	525	
15.000	53.163	0.360	147.7	0.213	5.00	0.0	0.600	o	375	
16.000	15.820	0.210	75.3	0.064	5.00	0.0	0.600	o	150	
16.001	38.537	0.810	47.6	0.061	0.00	0.0	0.600	o	300	
15.001	7.739	0.290	26.7	0.009	0.00	0.0	0.600	o	375	
17.000	30.705	0.190	161.6	0.133	5.00	0.0	0.600	o	300	
15.002	40.050	0.200	200.3	0.105	0.00	0.0	0.600	o	450	
15.003	12.752	0.070	182.2	0.052	0.00	0.0	0.600	o	525	
18.000	54.226	0.860	63.1	0.152	5.00	0.0	0.600	o	300	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.010	0.00	11.68	119.790	2.950	0.0	0.0	0.0	1.09	235.2	0.0
1.011	0.00	11.82	119.670	2.950	0.0	0.0	0.0	1.19	257.9	0.0
1.012	0.00	12.40	119.640	2.950	0.0	0.0	0.0	1.09	236.0	0.0
1.013	0.00	12.53	119.550	2.950	0.0	0.0	0.0	1.28	276.5	0.0
1.014	0.00	12.72	119.518	2.950	0.0	0.0	0.0	1.17	252.4	0.0
1.015	0.00	13.01	119.480	2.950	0.0	0.0	0.0	2.45	530.7	0.0
15.000	0.00	5.60	123.005	0.213	0.0	0.0	0.0	1.49	164.4	0.0
16.000	0.00	5.23	123.890	0.064	0.0	0.0	0.0	1.16	20.5	0.0
16.001	0.00	5.51	123.530	0.125	0.0	0.0	0.0	2.29	161.5	0.0
15.001	0.00	5.63	122.645	0.347	0.0	0.0	0.0	3.52	388.7	0.0
17.000	0.00	5.41	122.620	0.133	0.0	0.0	0.0	1.23	87.2	0.0
15.002	0.00	6.10	122.280	0.585	0.0	0.0	0.0	1.43	227.9	0.0
15.003	0.00	6.23	122.005	0.637	0.0	0.0	0.0	1.66	358.6	0.0
18.000	0.00	5.46	123.020	0.152	0.0	0.0	0.0	1.98	140.2	0.0

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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)	Auto Design
15.004	19.449	0.300	64.8	0.069	0.00	0.0	0.600	o	525	
15.005	11.031	0.060	183.9	0.012	0.00	0.0	0.600	o	600	
15.006	60.371	0.300	201.2	0.087	0.00	0.0	0.600	o	750	
19.000	19.311	0.130	148.5	0.045	5.00	0.0	0.600	o	150	
19.001	7.717	0.060	128.6	0.000	0.00	0.0	0.600	o	225	
19.002	36.223	0.250	144.9	0.040	0.00	0.0	0.600	o	300	
19.003	14.362	0.100	143.6	0.035	0.00	0.0	0.600	o	375	
19.004	26.956	0.130	207.4	0.031	0.00	0.0	0.600	o	750	
19.005	50.007	0.340	147.1	0.045	0.00	0.0	0.600	o	750	
15.007	21.961	0.320	68.6	0.190	0.00	0.0	0.600	o	750	
20.000	24.657	0.170	145.0	0.059	5.00	0.0	0.600	o	300	
20.001	11.150	0.050	223.0	0.000	0.00	0.0	0.600	o	375	
20.002	57.319	0.250	229.3	0.100	0.00	0.0	0.600	o	375	
20.003	57.682	0.250	230.7	0.209	0.00	0.0	0.600	o	525	
15.008	53.514	0.270	198.2	0.060	0.00	0.0	0.600	o	750	
21.000	26.369	1.060	24.9	0.100	5.00	0.0	0.600	o	225	
21.001	26.368	1.360	19.4	0.032	0.00	0.0	0.600	o	225	

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)
15.004	0.00	6.34	121.935	0.858	0.0	0.0	0.0	2.79	602.9	0.0
15.005	0.00	6.44	121.560	0.870	0.0	0.0	0.0	1.79	506.9	0.0
15.006	0.00	6.96	121.350	0.957	0.0	0.0	0.0	1.97	869.9	0.0
19.000	0.00	5.39	122.660	0.045	0.0	0.0	0.0	0.82	14.5	0.0
19.001	0.00	5.50	122.455	0.045	0.0	0.0	0.0	1.15	45.8	0.0
19.002	0.00	5.97	122.320	0.085	0.0	0.0	0.0	1.30	92.2	0.0
19.003	0.00	6.12	121.995	0.120	0.0	0.0	0.0	1.51	166.8	0.0
19.004	0.00	6.36	121.520	0.151	0.0	0.0	0.0	1.94	856.9	0.0
19.005	0.00	6.72	121.390	0.196	0.0	0.0	0.0	2.31	1018.5	0.0
15.007	0.00	7.06	121.050	1.343	0.0	0.0	0.0	3.38	1493.7	0.0
20.000	0.00	5.32	121.900	0.059	0.0	0.0	0.0	1.30	92.1	0.0
20.001	0.00	5.47	121.655	0.059	0.0	0.0	0.0	1.21	133.6	0.0
20.002	0.00	6.27	121.605	0.159	0.0	0.0	0.0	1.19	131.7	0.0
20.003	0.00	6.92	121.205	0.368	0.0	0.0	0.0	1.47	318.3	0.0
15.008	0.00	7.51	120.730	1.771	0.0	0.0	0.0	1.98	876.6	0.0
21.000	0.00	5.17	123.405	0.100	0.0	0.0	0.0	2.63	104.7	0.0
21.001	0.00	5.31	122.345	0.132	0.0	0.0	0.0	2.99	118.7	0.0

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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)	Auto Design
15.009	47.191	0.440	107.3	0.110	0.00	0.0	0.600	o	750	
15.010	41.163	0.210	196.0	0.238	0.00	0.0	0.600	o	900	
22.000	39.777	0.370	107.5	0.211	5.00	0.0	0.600	o	300	
22.001	55.655	2.340	23.8	0.079	0.00	0.0	0.600	o	375	
15.011	26.994	0.153	176.4	0.045	0.00	0.0	0.600	o	900	
15.012	26.010	0.147	176.9	0.040	0.00	0.0	0.600	o	900	
23.000	22.710	0.560	40.6	0.235	5.00	0.0	0.600	o	300	
23.001	10.044	0.070	143.5	0.000	0.00	0.0	0.600	o	300	
23.002	67.567	0.770	87.7	0.109	0.00	0.0	0.600	o	375	
23.003	55.711	0.190	293.2	0.119	0.00	0.0	0.600	o	375	
23.004	55.725	1.555	35.8	0.050	0.00	0.0	0.600	o	375	
15.013	19.547	0.040	488.7	0.145	0.00	0.0	0.600	o	1050	
15.014	25.868	0.050	517.4	0.027	0.00	0.0	0.600	o	1050	
24.000	21.406	0.680	31.5	0.164	5.00	0.0	0.600	o	225	
24.001	36.607	0.250	146.4	0.019	0.00	0.0	0.600	o	300	
24.002	21.558	0.400	53.9	0.056	0.00	0.0	0.600	o	300	

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)
15.009	0.00	7.80	120.460	2.013	0.0	0.0	0.0	2.70	1193.7	0.0
15.010	0.00	8.11	119.870	2.251	0.0	0.0	0.0	2.23	1421.5	0.0
22.000	0.00	5.44	122.970	0.211	0.0	0.0	0.0	1.52	107.2	0.0
22.001	0.00	5.69	122.525	0.290	0.0	0.0	0.0	3.73	411.8	0.0
15.011	0.00	8.30	119.660	2.586	0.0	0.0	0.0	2.36	1498.8	0.0
15.012	0.00	8.49	119.507	2.626	0.0	0.0	0.0	2.35	1496.6	0.0
23.000	0.00	5.15	123.105	0.235	0.0	0.0	0.0	2.48	175.0	0.0
23.001	0.00	5.28	122.545	0.235	0.0	0.0	0.0	1.31	92.6	0.0
23.002	0.00	5.86	122.400	0.344	0.0	0.0	0.0	1.94	213.7	0.0
23.003	0.00	6.74	121.630	0.463	0.0	0.0	0.0	1.05	116.3	0.0
23.004	0.00	7.05	121.440	0.513	0.0	0.0	0.0	3.04	335.2	0.0
15.013	0.00	8.70	119.210	3.284	0.0	0.0	0.0	1.55	1344.0	0.0
15.014	0.00	8.98	119.170	3.311	0.0	0.0	0.0	1.51	1305.9	0.0
24.000	0.00	5.15	123.125	0.164	0.0	0.0	0.0	2.34	93.0	0.0
24.001	0.00	5.62	122.370	0.183	0.0	0.0	0.0	1.30	91.7	0.0
24.002	0.00	5.79	122.120	0.239	0.0	0.0	0.0	2.15	151.7	0.0

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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)	Auto Design
24.003	29.650	1.850	16.0	0.076	0.00	0.0	0.600	o	300	
15.015	31.230#	0.090	347.0	0.100	0.00	0.0	0.600	o	1050	
15.016	3.227	0.020	161.4	0.000	0.00	0.0	0.600	o	225	
1.016	12.868	0.040	321.7	0.000	0.00	0.0	0.600	o	525	
1.017	4.635	0.020	231.8	0.000	0.00	0.0	0.600	o	525	
1.018	7.557	0.040	188.9	0.000	0.00	0.0	0.600	o	525	
1.019	3.323	0.030	110.8	0.000	0.00	0.0	0.600	o	525	

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)
24.003	0.00	5.92	121.720	0.315	0.0	0.0	0.0	3.95	279.0	0.0
15.015	0.00	9.26	119.120	3.726	0.0	0.0	0.0	1.84	1596.9	0.0
15.016	0.00	9.32	118.990	3.726	0.0	0.0	0.0	1.03	40.8	0.0
1.016	0.00	13.19	118.970	6.676	0.0	0.0	0.0	1.24	269.1	0.0
1.017	0.00	13.24	118.930	6.676	0.0	0.0	0.0	1.47	317.6	0.0
1.018	0.00	13.32	118.710	6.676	0.0	0.0	0.0	1.63	352.0	0.0
1.019	0.00	13.34	118.670	6.676	0.0	0.0	0.0	2.13	460.6	0.0

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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1.019	HW01	119.770	118.640	0.000	0	0
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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /ha Storage	1.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	4
Number of Online Controls	6	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details



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Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location	GB 450500 225250 SP 50500 25250
C (1km)	-0.023
D1 (1km)	0.328
D2 (1km)	0.309
D3 (1km)	0.264
E (1km)	0.292
F (1km)	2.461
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	15

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Online Controls for Storm

Orifice Manhole: Swale, DS/PN: 1.001, Volume (m<sup>3</sup>): 32.6

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 123.200

Orifice Manhole: Swale, DS/PN: 1.002, Volume (m<sup>3</sup>): 32.5

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 122.700

Hydro-Brake® Manhole: B1- 9, DS/PN: 1.007, Volume (m<sup>3</sup>): 5.6

Design Head (m) 1.200 Hydro-Brake® Type Md5 SW Only Invert Level (m) 121.531  
Design Flow (l/s) 15.0 Diameter (mm) 150

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.0	1.200	14.8	3.000	23.5	7.000	35.8
0.200	9.8	1.400	16.0	3.500	25.3	7.500	37.1
0.300	10.9	1.600	17.1	4.000	27.1	8.000	38.3
0.400	10.8	1.800	18.2	4.500	28.7	8.500	39.5
0.500	10.8	2.000	19.2	5.000	30.3	9.000	40.6
0.600	11.1	2.200	20.1	5.500	31.8	9.500	41.7
0.800	12.3	2.400	21.0	6.000	33.2		
1.000	13.6	2.600	21.8	6.500	34.5		

Complex Manhole: 243a (HB), DS/PN: 8.002, Volume (m<sup>3</sup>): 49.5

Hydro-Brake Optimum®

Unit Reference MD-SHE-0045-1400-2400-1400  
Design Head (m) 2.400  
Design Flow (l/s) 1.4  
Flush-Flo™ Calculated  
Objective Minimise upstream storage  
Diameter (mm) 45  
Invert Level (m) 120.335  
Minimum Outlet Pipe Diameter (mm) 75  
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.400	1.4	Kick-Flo®	0.404	0.6
Flush-Flo™	0.200	0.8	Mean Flow over Head Range	-	1.0

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

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Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.7	1.200	1.0	3.000	1.5	7.000	2.3
0.200	0.8	1.400	1.1	3.500	1.7	7.500	2.4
0.300	0.7	1.600	1.2	4.000	1.8	8.000	2.4
0.400	0.6	1.800	1.2	4.500	1.9	8.500	2.5
0.500	0.7	2.000	1.3	5.000	2.0	9.000	2.6
0.600	0.8	2.200	1.3	5.500	2.0	9.500	2.6
0.800	0.9	2.400	1.4	6.000	2.1		
1.000	0.9	2.600	1.4	6.500	2.2		

Hydro-Brake Optimum®

Unit Reference MD-SHE-0070-2100-0900-2100  
 Design Head (m) 0.900  
 Design Flow (l/s) 2.1  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Diameter (mm) 70  
 Invert Level (m) 121.835  
 Minimum Outlet Pipe Diameter (mm) 100  
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	2.1	Kick-Flo®	0.563	1.7
Flush-Flo™	0.271	2.1	Mean Flow over Head Range	-	1.8

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	1.8	1.200	2.4	3.000	3.6	7.000	5.4
0.200	2.1	1.400	2.6	3.500	3.9	7.500	5.6
0.300	2.1	1.600	2.7	4.000	4.2	8.000	5.8
0.400	2.0	1.800	2.9	4.500	4.4	8.500	5.9
0.500	1.9	2.000	3.0	5.000	4.6	9.000	6.1
0.600	1.7	2.200	3.2	5.500	4.8	9.500	6.3
0.800	2.0	2.400	3.3	6.000	5.0		
1.000	2.2	2.600	3.4	6.500	5.2		

Hydro-Brake Optimum® Manhole: 234 (HB), DS/PN: 13.002, Volume (m³): 18.0

Unit Reference MD-SHE-0074-3000-1600-3000  
 Design Head (m) 1.600  
 Design Flow (l/s) 3.0  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage

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Hydro-Brake Optimum® Manhole: 234 (HB), DS/PN: 13.002, Volume (m³): 18.0

Diameter (mm) 74  
 Invert Level (m) 120.450  
 Minimum Outlet Pipe Diameter (mm) 100  
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	3.0	Kick-Flo®	0.661	2.0
Flush-Flo™	0.323	2.5	Mean Flow over Head Range	-	2.4

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)
0.100	2.0	1.200	2.6	3.000	4.0	7.000	6.0
0.200	2.4	1.400	2.8	3.500	4.3	7.500	6.2
0.300	2.5	1.600	3.0	4.000	4.6	8.000	6.4
0.400	2.5	1.800	3.2	4.500	4.9	8.500	6.5
0.500	2.4	2.000	3.3	5.000	5.1	9.000	6.7
0.600	2.2	2.200	3.5	5.500	5.3	9.500	6.9
0.800	2.2	2.400	3.6	6.000	5.6		
1.000	2.4	2.600	3.8	6.500	5.8		

Complex Manhole: 256 (HB), DS/PN: 15.016, Volume (m³): 38.0

Hydro-Brake Optimum®

Unit Reference MD-SCL-0042-1300-2400-1300  
 Design Head (m) 2.400  
 Design Flow (l/s) 1.3  
 Flush-Flo™ Calculated  
 Objective Minimise blockage risk  
 Diameter (mm) 42  
 Invert Level (m) 118.990  
 Minimum Outlet Pipe Diameter (mm) 75  
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.400	1.3	Kick-Flo®	0.372	0.6
Flush-Flo™	0.170	0.7	Mean Flow over Head Range	-	0.9

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

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Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.7	1.200	1.0	3.000	1.4	7.000	2.1
0.200	0.7	1.400	1.0	3.500	1.5	7.500	2.2
0.300	0.7	1.600	1.1	4.000	1.6	8.000	2.2
0.400	0.6	1.800	1.1	4.500	1.7	8.500	2.3
0.500	0.7	2.000	1.2	5.000	1.8	9.000	2.4
0.600	0.7	2.200	1.2	5.500	1.9	9.500	2.4
0.800	0.8	2.400	1.3	6.000	2.0		
1.000	0.9	2.600	1.3	6.500	2.0		

Hydro-Brake Optimum®

Unit Reference MD-SHE-0107-4900-0820-4900  
 Design Head (m) 0.820  
 Design Flow (l/s) 4.9  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Diameter (mm) 107  
 Invert Level (m) 120.560  
 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)	0.820	4.9	Kick-Flo®	0.545	4.1
Flush-Flo™	0.245	4.9	Mean Flow over Head Range	-	4.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.7	1.200	5.8	3.000	9.0	7.000	13.5
0.200	4.9	1.400	6.3	3.500	9.7	7.500	13.9
0.300	4.9	1.600	6.7	4.000	10.3	8.000	14.3
0.400	4.7	1.800	7.1	4.500	10.9	8.500	14.7
0.500	4.4	2.000	7.4	5.000	11.5	9.000	15.2
0.600	4.2	2.200	7.8	5.500	12.0	9.500	15.6
0.800	4.8	2.400	8.1	6.000	12.5		
1.000	5.4	2.600	8.4	6.500	13.0		

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Storage Structures for Storm

Complex Manhole: SW MH, DS/PN: 2.001

Tank or Pond

Invert Level (m) 121.840

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	69.0	0.401	0.0	0.403	7.0	0.704	0.0
0.400	69.0	0.402	0.0	0.703	7.0		

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.7
Membrane Percolation (mm/hr)	1000	Length (m)	60.0
Max Percolation (l/s)	145.0	Slope (1:X)	80.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	5
Invert Level (m)	122.630	Cap Volume Depth (m)	0.000

Complex Manhole: Pond, DS/PN: 12.000

Tank or Pond

Invert Level (m) 120.890

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	337.7	2.200	1044.5

Trench Soakaway

Infiltration Coefficient Base (m/hr)	0.12564	Trench Width (m)	10.0
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	22.0
Safety Factor	1.0	Slope (1:X)	0.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	120.890	Cap Infiltration Depth (m)	0.000

Tank or Pond Manhole: 232, DS/PN: 13.000

Invert Level (m) 120.860

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	60.0	0.500	60.0	0.501	0.0

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Complex Manhole: 256 (HB), DS/PN: 15.016

Trench Soakaway

Infiltration Coefficient Base (m/hr) 0.02707	Trench Width (m) 6.8
Infiltration Coefficient Side (m/hr) 0.00000	Trench Length (m) 62.8
Safety Factor 1.0	Slope (1:X) 0.0
Porosity 0.30	Cap Volume Depth (m) 0.000
Invert Level (m) 118.990	Cap Infiltration Depth (m) 0.000

Tank or Pond

Invert Level (m) 119.020

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	445.0	2.800	1965.9	2.801	0.0

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

Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0      MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
 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 Storage Structures 4  
 Number of Online Controls 6      Number of Time/Area Diagrams 0  
 Number of Offline Controls 0      Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model      FEH  
 Site Location GB 450500 225250 SP 50500 25250  
 C (1km)      -0.023  
 D1 (1km)      0.328  
 D2 (1km)      0.309  
 D3 (1km)      0.264  
 E (1km)      0.292  
 F (1km)      2.461  
 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      ON  
     DVD Status      ON  
     Inertia Status      ON

Profile(s)      Summer and Winter  
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440  
 Return Period(s) (years)      1  
 Climate Change (%)      0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	1	0%					
1.001	15 Winter	1	0%					
1.002	30 Winter	1	0%					
1.003	30 Winter	1	0%					
1.004	15 Winter	1	0%					
2.000	15 Winter	1	0%					
2.001	60 Winter	1	0%					
1.005	30 Winter	1	0%					
3.000	30 Winter	1	0%					
1.006	30 Winter	1	0%					
1.007	30 Winter	1	0%	1/15 Summer				
1.008	30 Winter	1	0%					
1.009	30 Winter	1	0%					
4.000	15 Winter	1	0%	1/15 Summer				



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

PN	Storm	Return Climate Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
5.000	15	Winter	1	0%				
4.001	15	Winter	1	0%	1/15	Summer		
4.002	15	Winter	1	0%				
6.000	15	Winter	1	0%				
6.001	15	Winter	1	0%				
6.002	15	Winter	1	0%				
4.003	15	Winter	1	0%	1/15	Winter		
7.000	15	Winter	1	0%				
7.001	15	Winter	1	0%				
4.004	15	Winter	1	0%				
4.005	15	Winter	1	0%				
4.006	15	Winter	1	0%				
4.007	15	Winter	1	0%				
8.000	60	Winter	1	0%				
9.000	15	Winter	1	0%				
9.001	15	Winter	1	0%				
9.002	15	Winter	1	0%				
10.000	30	Winter	1	0%				
9.003	30	Winter	1	0%				
9.004	30	Winter	1	0%	1/15	Summer		
8.001	240	Summer	1	0%				
11.000	15	Winter	1	0%				
11.001	30	Winter	1	0%				
11.002	30	Winter	1	0%				
11.003	30	Winter	1	0%	1/15	Summer		
12.000	360	Winter	1	0%				
8.002	30	Winter	1	0%	1/15	Summer		
4.008	15	Winter	1	0%				
13.000	15	Winter	1	0%				
13.001	60	Winter	1	0%				
14.000	15	Winter	1	0%				
13.002	60	Winter	1	0%	1/15	Summer		
4.009	15	Winter	1	0%				
1.010	15	Winter	1	0%				
1.011	15	Winter	1	0%				
1.012	15	Winter	1	0%				
1.013	15	Winter	1	0%				
1.014	15	Winter	1	0%				
1.015	15	Winter	1	0%				
15.000	15	Winter	1	0%				
16.000	15	Winter	1	0%				
16.001	15	Winter	1	0%				
15.001	15	Winter	1	0%				
17.000	15	Winter	1	0%				
15.002	15	Winter	1	0%				
15.003	15	Winter	1	0%				
18.000	15	Winter	1	0%				
15.004	15	Winter	1	0%				
15.005	15	Winter	1	0%				
15.006	15	Winter	1	0%				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
19.000	15 Winter	1	0%					
19.001	15 Winter	1	0%					
19.002	15 Winter	1	0%					
19.003	15 Winter	1	0%					
19.004	15 Winter	1	0%					
19.005	15 Winter	1	0%					
15.007	15 Winter	1	0%					
20.000	15 Winter	1	0%					
20.001	15 Winter	1	0%					
20.002	15 Winter	1	0%					
20.003	15 Winter	1	0%					
15.008	15 Winter	1	0%					
21.000	15 Winter	1	0%					
21.001	15 Winter	1	0%					
15.009	15 Winter	1	0%					
15.010	15 Winter	1	0%					
22.000	15 Winter	1	0%					
22.001	15 Winter	1	0%					
15.011	15 Winter	1	0%					
15.012	1440 Winter	1	0%					
23.000	15 Winter	1	0%					
23.001	15 Winter	1	0%					
23.002	15 Winter	1	0%					
23.003	15 Winter	1	0%					
23.004	15 Winter	1	0%					
15.013	1440 Winter	1	0%					
15.014	1440 Winter	1	0%					
24.000	15 Winter	1	0%					
24.001	15 Winter	1	0%					
24.002	15 Winter	1	0%					
24.003	15 Winter	1	0%					
15.015	1440 Winter	1	0%					
15.016	1440 Winter	1	0%	1/15 Summer				
1.016	15 Winter	1	0%					
1.017	15 Winter	1	0%					
1.018	15 Winter	1	0%					
1.019	15 Winter	1	0%					

PN	US/MH Name	Water	Flooded		Pipe		Status	
		Level (m)	Surch'd Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	O'flow (l/s)		Flow (l/s)
1.000	Swale	123.851	-0.999	0.000	0.00	0.0	3.5	OK
1.001	Swale	123.513	-0.687	0.000	0.00	0.0	2.8	OK
1.002	Swale	123.033	-0.667	0.000	0.00	0.0	2.9	OK
1.003	Swale	122.484	-0.116	0.000	0.12	0.0	2.9	OK
1.004	B1- 5	121.932	-0.381	0.000	0.06	0.0	8.3	OK
2.000	SW MH	122.052	-0.303	0.000	0.08	0.0	10.0	OK
2.001	SW MH	121.896	-0.329	0.000	0.04	0.0	3.0	OK
1.005	B1- 6	121.762	-0.436	0.000	0.04	0.0	9.6	OK

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

PN	US/MH Name	Water		Flooded		Pipe		Status
		Level (m)	Surch'd Depth (m)	Volume (m³)	Flow / Cap.	O'flow (l/s)	Flow (l/s)	
3.000	B1- 13	121.758	-0.202	0.000	0.02	0.0	2.6	OK
1.006	B1- 8	121.758	-0.390	0.000	0.07	0.0	10.8	OK
1.007	B1- 9	121.755	0.074	0.000	0.71	0.0	10.2	SURCHARGED
1.008	Ex MH	121.446	-0.079	0.000	0.45	0.0	10.2	OK
1.009	Ex MH	121.064	-0.161	0.000	0.18	0.0	10.2	OK
4.000	Ex MH 1113	122.195	0.463	0.000	1.56	0.0	56.6	SURCHARGED
5.000	Ex MH 1109	122.002	-0.109	0.000	0.17	0.0	6.7	OK
4.001	Ex MH 1111	121.612	0.038	0.000	1.21	0.0	63.1	SURCHARGED
4.002	Ex MH 1110	121.425	-0.119	0.000	0.67	0.0	63.6	OK
6.000	Ex MH 1097	123.176	-0.056	0.000	0.39	0.0	2.6	OK
6.001	Ex MH 1115	122.939	-0.102	0.000	0.22	0.0	5.1	OK
6.002	Ex MH 1071	122.074	-0.101	0.000	0.23	0.0	4.9	OK
4.003	Ex MH 121.214	121.214	0.024	0.000	1.05	0.0	62.2	SURCHARGED
7.000	Ex MH 1112	122.015	-0.167	0.000	0.36	0.0	29.6	OK
7.001	Ex PI	121.236	-0.184	0.000	0.31	0.0	27.4	OK
4.004	Ex MH	120.824	-0.241	0.000	0.29	0.0	88.6	OK
4.005	Ex MH	120.761	-0.304	0.000	0.37	0.0	87.5	OK
4.006	100 (D)	120.633	-0.312	0.000	0.34	0.0	86.1	OK
4.007	101 (D)	120.424	-0.311	0.000	0.35	0.0	84.6	OK
8.000	Dummy	120.705	0.000	0.000	0.04	0.0	0.3	SURCHARGED*
9.000	237	123.609	-0.211	0.000	0.19	0.0	29.5	OK
9.001	238	122.862	-0.268	0.000	0.18	0.0	34.6	OK
9.002	239	122.592	-0.288	0.000	0.12	0.0	40.9	OK
10.000	240	121.492	-0.263	0.000	0.17	0.0	33.5	OK
9.003	241	121.484	-0.006	0.000	0.21	0.0	70.5	OK
9.004	242	121.375	0.165	0.000	0.13	0.0	40.0	SURCHARGED
8.001	243	121.255	0.000	0.000	0.06	0.0	33.4	OK
11.000	229	121.806	-0.224	0.000	0.14	0.0	13.0	OK
11.001	230	121.325	-0.325	0.000	0.13	0.0	25.6	OK
11.002	231	121.304	-0.196	0.000	0.15	0.0	50.8	OK
11.003	235	121.254	0.079	0.000	0.08	0.0	38.8	SURCHARGED
12.000	Pond	121.169	-0.471	0.000	0.00	0.0	0.3	OK
8.002	243a (HB)	121.227	0.592	0.000	0.01	0.0	0.9	SURCHARGED
4.008	102 (D)	120.266	-0.309	0.000	0.35	0.0	84.5	OK
13.000	232	120.873	-0.437	0.000	0.01	0.0	1.1	OK
13.001	233	120.828	-0.372	0.000	0.01	0.0	4.4	OK
14.000	234a	121.413	-0.187	0.000	0.07	0.0	8.0	OK
13.002	234 (HB)	120.828	0.228	0.000	0.12	0.0	2.5	SURCHARGED
4.009	103 (D)	120.133	-0.322	0.000	0.30	0.0	85.5	OK
1.010	Ex MH	120.051	-0.264	0.000	0.44	0.0	93.4	OK
1.011	Ex MH	119.957	-0.238	0.000	0.58	0.0	92.4	OK
1.012	Ex MH	119.907	-0.258	0.000	0.45	0.0	91.0	OK
1.013	Ex MH	119.824	-0.251	0.000	0.50	0.0	90.3	OK
1.014	104 (D)	119.795	-0.247	0.000	0.55	0.0	90.0	OK
1.015	105 (D)	119.636	-0.369	0.000	0.19	0.0	90.1	OK
15.000	200	123.115	-0.265	0.000	0.18	0.0	27.9	OK
16.000	201	123.961	-0.079	0.000	0.45	0.0	8.5	OK
16.001	202	123.595	-0.235	0.000	0.10	0.0	15.3	OK
15.001	203	122.762	-0.258	0.000	0.21	0.0	44.5	OK

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

PN	US/MH Name	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow	Pipe	Status
		Level (m)		Volume (m <sup>3</sup> )		Flow (l/s)	Flow (l/s)	
17.000	204	122.716	-0.204	0.000	0.22	0.0	17.5	OK
15.002	205	122.467	-0.263	0.000	0.36	0.0	72.7	OK
15.003	206	122.208	-0.322	0.000	0.31	0.0	77.9	OK
18.000	207	123.098	-0.222	0.000	0.15	0.0	20.1	OK
15.004	208	122.113	-0.347	0.000	0.25	0.0	104.4	OK
15.005	209	121.795	-0.365	0.000	0.32	0.0	106.6	OK
15.006	210	121.546	-0.554	0.000	0.15	0.0	113.9	OK
19.000	211	122.730	-0.080	0.000	0.44	0.0	5.9	OK
19.001	212	122.518	-0.162	0.000	0.17	0.0	6.0	OK
19.002	213	122.390	-0.230	0.000	0.12	0.0	10.5	OK
19.003	214	122.080	-0.290	0.000	0.12	0.0	14.3	OK
19.004	215	121.604	-0.666	0.000	0.03	0.0	17.6	OK
19.005	216	121.471	-0.669	0.000	0.03	0.0	22.3	OK
15.007	217	121.260	-0.540	0.000	0.17	0.0	153.7	OK
20.000	218	121.962	-0.238	0.000	0.09	0.0	7.8	OK
20.001	219	121.731	-0.299	0.000	0.08	0.0	7.8	OK
20.002	220	121.704	-0.276	0.000	0.15	0.0	19.0	OK
20.003	221	121.339	-0.391	0.000	0.15	0.0	41.8	OK
15.008	222	120.994	-0.486	0.000	0.27	0.0	199.6	OK
21.000	223	123.461	-0.169	0.000	0.14	0.0	13.4	OK
21.001	223a	122.404	-0.166	0.000	0.15	0.0	16.8	OK
15.009	224	120.698	-0.512	0.000	0.22	0.0	220.7	OK
15.010	225	120.164	-0.606	0.000	0.23	0.0	239.0	OK
22.000	226	123.079	-0.191	0.000	0.28	0.0	27.8	OK
22.001	227	122.603	-0.297	0.000	0.10	0.0	37.2	OK
15.011	228	119.985	-0.575	0.000	0.28	0.0	268.8	OK
15.012	228a	119.888	-0.519	0.000	0.02	0.0	21.1	OK
23.000	244	123.197	-0.208	0.000	0.20	0.0	31.4	OK
23.001	245	122.692	-0.153	0.000	0.47	0.0	31.0	OK
23.002	246	122.519	-0.256	0.000	0.21	0.0	43.2	OK
23.003	247	121.822	-0.183	0.000	0.50	0.0	54.3	OK
23.004	248	121.550	-0.265	0.000	0.19	0.0	58.9	OK
15.013	249	119.888	-0.372	0.000	0.03	0.0	25.9	OK
15.014	250	119.887	-0.333	0.000	0.03	0.0	25.5	OK
24.000	251	123.203	-0.147	0.000	0.26	0.0	21.9	OK
24.001	252	122.479	-0.191	0.000	0.28	0.0	23.8	OK
24.002	253	122.217	-0.203	0.000	0.23	0.0	30.1	OK
24.003	254	121.798	-0.222	0.000	0.15	0.0	38.7	OK
15.015	255	119.887	-0.283	0.000	0.02	0.0	28.1	OK
15.016	256 (HB)	119.886	0.671	0.000	0.03	0.0	0.8	SURCHARGED
1.016	106 (D)	119.245	-0.250	0.000	0.49	0.0	90.0	OK
1.017	107 (D)	119.210	-0.245	0.000	0.55	0.0	90.4	OK
1.018	108 (PI)	118.947	-0.288	0.000	0.42	0.0	90.2	OK
1.019	109	118.912	-0.283	0.000	0.43	0.0	89.9	OK