


Woods Hardwick		Page 1
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 12/05/2021 17:26	Designed by a.tew	
File SW PH9 Proposed 12.05.21...	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	

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	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

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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
1.002	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	
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	

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)
1.002	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
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

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
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	
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	

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)
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
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

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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
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	
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	

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)
9.000	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
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

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
8.002	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	
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	

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)
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
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


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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
15.000	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	
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	

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)
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
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


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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
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)
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	

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



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
24.001	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	
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)
24.001	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
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)
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 Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 6    Number of Storage Structures 4    Number of Real Time Controls 0

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: Bl- 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

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Hydro-Brake Optimum®

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	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®	0.564	1.7
Flush-Flo™	0.273	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	3.7	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	6.0
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	5.1		
1.000	2.2	2.600	3.4	6.500	5.2		

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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  
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

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Hydro-Brake Optimum®

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

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	0.500	4.4	1.200	5.8	2.000	7.4
0.200	4.9	0.600	4.2	1.400	6.3	2.200	7.8
0.300	4.9	0.800	4.8	1.600	6.7	2.400	8.1
0.400	4.7	1.000	5.4	1.800	7.1	2.600	8.4

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Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
3.000	9.0	5.000	11.5	7.000	13.5	9.000	15.2
3.500	9.7	5.500	12.0	7.500	13.9	9.500	15.6
4.000	10.3	6.000	12.5	8.000	14.3		
4.500	10.9	6.500	13.0	8.500	14.7		

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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



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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

Tank or Pond Manhole: 256 (HB), DS/PN: 15.016

Invert Level (m) 118.990

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	632.9	2.800	2195.0	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 Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 6    Number of Storage Structures 4    Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model    FEH    D3 (1km) 0.264  
Site Location GB 450500 225250 SP 50500 25250    E (1km) 0.292  
C (1km)    -0.023    F (1km) 2.461  
D1 (1km)    0.328    Cv (Summer) 0.750  
D2 (1km)    0.309    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)    100  
Climate Change (%)    30

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow Act.	O/F	Lvl Exc.
1.000	15 Winter	100	+30%					
1.001	15 Winter	100	+30%					
1.002	60 Winter	100	+30%					
1.003	60 Winter	100	+30%	100/15 Winter				
1.004	60 Winter	100	+30%	100/15 Summer				
2.000	60 Winter	100	+30%	100/15 Winter				
2.001	60 Winter	100	+30%	100/15 Summer				
1.005	60 Winter	100	+30%	100/15 Summer				
3.000	60 Winter	100	+30%	100/15 Summer				
1.006	60 Winter	100	+30%	100/15 Summer				
1.007	60 Winter	100	+30%	100/15 Summer	100/60 Winter			1
1.008	60 Winter	100	+30%					
1.009	60 Winter	100	+30%					
4.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			8
5.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4

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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.
4.001	15 Summer	100	+30%	100/15 Summer				
4.002	15 Winter	100	+30%	100/15 Summer				
6.000	15 Winter	100	+30%	100/15 Summer				
6.001	15 Winter	100	+30%	100/15 Summer				
6.002	15 Winter	100	+30%	100/15 Summer				
4.003	15 Winter	100	+30%	100/15 Summer				
7.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
7.001	15 Winter	100	+30%	100/15 Summer				
4.004	15 Winter	100	+30%	100/15 Summer				
4.005	15 Winter	100	+30%					
4.006	15 Winter	100	+30%					
4.007	15 Winter	100	+30%					
8.000	60 Winter	100	+30%					
9.000	15 Winter	100	+30%	100/15 Summer				
9.001	15 Winter	100	+30%	100/15 Summer				
9.002	15 Winter	100	+30%	100/15 Summer				
10.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
9.003	15 Winter	100	+30%	100/15 Summer				
9.004	15 Winter	100	+30%	100/15 Summer				
8.001	480 Winter	100	+30%	100/15 Summer				
11.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
11.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
11.002	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
11.003	480 Winter	100	+30%	100/15 Summer				
12.000	480 Winter	100	+30%	100/15 Summer				
8.002	480 Winter	100	+30%	100/15 Summer				
4.008	15 Winter	100	+30%	100/15 Summer				
13.000	120 Winter	100	+30%	100/15 Winter				
13.001	120 Winter	100	+30%	100/15 Summer				
14.000	120 Winter	100	+30%	100/15 Winter				
13.002	120 Winter	100	+30%	100/15 Summer				
4.009	15 Winter	100	+30%	100/15 Summer				
1.010	15 Winter	100	+30%	100/15 Summer				
1.011	15 Winter	100	+30%	100/15 Summer				
1.012	15 Winter	100	+30%	100/15 Summer				
1.013	15 Winter	100	+30%	100/15 Summer				
1.014	60 Winter	100	+30%					
1.015	15 Winter	100	+30%					
15.000	15 Winter	100	+30%	100/15 Summer				
16.000	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
16.001	15 Winter	100	+30%	100/15 Summer				
15.001	15 Winter	100	+30%	100/15 Summer				
17.000	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
15.002	15 Winter	100	+30%	100/15 Summer				
15.003	15 Winter	100	+30%	100/15 Summer				

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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.
18.000	15 Winter	100	+30%	100/15 Summer				
15.004	15 Winter	100	+30%	100/15 Summer				
15.005	15 Winter	100	+30%	100/15 Summer				
15.006	15 Winter	100	+30%	100/15 Summer				
19.000	15 Winter	100	+30%	100/15 Summer				
19.001	15 Winter	100	+30%	100/15 Winter				
19.002	15 Winter	100	+30%	100/15 Winter				
19.003	15 Winter	100	+30%	100/15 Winter				
19.004	15 Winter	100	+30%	100/15 Winter				
19.005	15 Winter	100	+30%	100/15 Summer				
15.007	15 Winter	100	+30%	100/15 Summer				
20.000	15 Winter	100	+30%	100/15 Summer				
20.001	15 Winter	100	+30%	100/15 Summer				
20.002	15 Winter	100	+30%	100/15 Summer				
20.003	15 Winter	100	+30%	100/15 Summer				
15.008	15 Winter	100	+30%	100/15 Summer				
21.000	15 Winter	100	+30%					
21.001	15 Winter	100	+30%	100/15 Winter				
15.009	15 Winter	100	+30%	100/15 Summer				
15.010	15 Winter	100	+30%	100/15 Summer				
22.000	15 Winter	100	+30%	100/15 Summer				
22.001	15 Winter	100	+30%					
15.011	1440 Winter	100	+30%	100/15 Summer				
15.012	1440 Winter	100	+30%	100/15 Summer				
23.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
23.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
23.002	15 Winter	100	+30%	100/15 Summer				
23.003	15 Winter	100	+30%	100/15 Summer				
23.004	15 Winter	100	+30%	100/15 Summer				
15.013	1440 Winter	100	+30%	100/15 Summer				
15.014	1440 Winter	100	+30%	100/15 Summer				
24.000	15 Winter	100	+30%	100/15 Summer				
24.001	15 Winter	100	+30%	100/15 Summer				
24.002	15 Winter	100	+30%	100/15 Summer				
24.003	15 Winter	100	+30%					
15.015	1440 Winter	100	+30%	100/15 Summer				
15.016	1440 Winter	100	+30%	100/15 Summer				
1.016	15 Winter	100	+30%	100/15 Summer				
1.017	30 Winter	100	+30%					
1.018	15 Winter	100	+30%	100/15 Winter				
1.019	15 Winter	100	+30%					

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

PN	US/MH Name	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m <sup>3</sup> )	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	Swale	124.052	-0.798	0.000	0.00	0.0	19.9	OK
1.001	Swale	124.052	-0.148	0.000	0.00	0.0	4.2	FLOOD RISK
1.002	Swale	123.468	-0.232	0.000	0.00	0.0	4.4	FLOOD RISK
1.003	Swale	122.828	0.228	0.000	0.31	0.0	7.5	SURCHARGED
1.004	B1- 5	122.816	0.503	0.000	0.14	0.0	20.1	SURCHARGED
2.000	SW MH	122.815	0.460	0.000	0.20	0.0	24.7	SURCHARGED
2.001	SW MH	122.812	0.587	0.000	0.14	0.0	11.8	FLOOD RISK
1.005	B1- 6	122.813	0.615	0.000	0.08	0.0	17.5	FLOOD RISK
3.000	B1- 13	122.814	0.854	0.000	0.07	0.0	8.5	SURCHARGED
1.006	B1- 8	122.813	0.665	0.000	0.12	0.0	17.9	FLOOD RISK
1.007	B1- 9	122.811	1.130	0.091	1.03	0.0	14.8	FLOOD
1.008	Ex MH	121.464	-0.061	0.000	0.66	0.0	14.8	OK
1.009	Ex MH	121.078	-0.147	0.000	0.26	0.0	14.8	OK
4.000	Ex MH 1113	123.284	1.552	107.392	2.44	0.0	88.6	FLOOD
5.000	Ex MH 1109	122.564	0.453	2.955	0.56	0.0	22.3	FLOOD
4.001	Ex MH 1111	122.422	0.848	0.000	1.87	0.0	97.3	SURCHARGED
4.002	Ex MH 1110	122.295	0.751	0.000	1.13	0.0	107.8	SURCHARGED
6.000	Ex MH 1097	124.301	1.069	0.000	1.73	0.0	11.6	FLOOD RISK
6.001	Ex MH 1115	123.594	0.553	0.000	1.01	0.0	23.8	SURCHARGED
6.002	Ex MH 1071	122.822	0.647	0.000	0.96	0.0	20.8	SURCHARGED
4.003	Ex MH 1112	123.607	1.425	7.952	1.64	0.0	136.2	FLOOD
7.001	Ex PI 121.562	121.562	0.142	0.000	1.48	0.0	129.5	SURCHARGED
4.004	Ex MH 121.194	121.194	0.129	0.000	0.80	0.0	242.4	SURCHARGED
4.005	Ex MH 121.065	121.065	0.000	0.000	1.01	0.0	240.5	OK
4.006	100 (D)	120.834	-0.111	0.000	0.95	0.0	238.9	OK
4.007	101 (D)	120.706	-0.029	0.000	0.95	0.0	231.8	OK
8.000	Dummy	120.705	0.000	0.000	0.01	0.0	0.1	SURCHARGED*
9.000	237	124.930	1.110	0.000	1.00	0.0	153.1	SURCHARGED
9.001	238	124.186	1.056	0.000	0.96	0.0	186.9	SURCHARGED
9.002	239	123.952	1.072	0.000	0.65	0.0	223.1	SURCHARGED
10.000	240	123.584	1.829	4.577	1.17	0.0	233.4	FLOOD
9.003	241	123.353	1.863	0.000	1.49	0.0	509.9	SURCHARGED
9.004	242	122.718	1.508	0.000	1.62	0.0	512.4	SURCHARGED
8.001	243	122.400	1.145	0.000	0.11	0.0	63.0	SURCHARGED
11.000	229	122.974	0.944	3.973	0.91	0.0	83.5	FLOOD
11.001	230	122.919	1.269	0.295	0.90	0.0	177.1	FLOOD
11.002	231	122.800	1.300	0.466	1.24	0.0	410.7	FLOOD
11.003	235	122.398	1.223	0.000	0.09	0.0	45.0	SURCHARGED
12.000	Pond	122.385	0.745	0.000	0.00	0.0	3.1	SURCHARGED
8.002	243a (HB)	122.397	1.762	0.000	0.05	0.0	3.3	SURCHARGED
4.008	102 (D)	120.597	0.022	0.000	0.91	0.0	217.0	SURCHARGED
13.000	232	122.483	1.173	0.000	0.09	0.0	15.4	SURCHARGED
13.001	233	122.483	1.283	0.000	0.03	0.0	9.0	SURCHARGED

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 (m <sup>3</sup> )	Flow / Cap.	O'flow (l/s)		Flow (l/s)
14.000	234a	122.485	0.885	0.000	0.10	0.0	11.9	SURCHARGED
13.002	234 (HB)	122.483	1.883	0.000	0.16	0.0	3.3	SURCHARGED
4.009	103 (D)	120.499	0.044	0.000	0.74	0.0	210.2	SURCHARGED
1.010	Ex MH	120.374	0.059	0.000	1.05	0.0	220.2	SURCHARGED
1.011	Ex MH	120.243	0.048	0.000	1.37	0.0	219.6	SURCHARGED
1.012	Ex MH	120.195	0.030	0.000	1.08	0.0	219.4	SURCHARGED
1.013	Ex MH	120.104	0.029	0.000	1.22	0.0	219.3	SURCHARGED
1.014	104 (D)	120.043	0.000	0.000	1.22	0.0	200.9	OK
1.015	105 (D)	119.733	-0.272	0.000	0.47	0.0	219.3	OK
15.000	200	124.465	1.085	0.000	0.91	0.0	138.5	FLOOD RISK
16.000	201	125.257	1.217	0.119	2.20	0.0	41.8	FLOOD
16.001	202	124.368	0.538	0.000	0.55	0.0	82.4	SURCHARGED
15.001	203	124.147	1.127	0.000	1.03	0.0	217.5	SURCHARGED
17.000	204	123.942	1.022	2.305	1.07	0.0	84.7	FLOOD
15.002	205	123.869	1.139	0.000	1.73	0.0	350.3	SURCHARGED
15.003	206	123.382	0.852	0.000	1.51	0.0	375.2	SURCHARGED
18.000	207	123.524	0.204	0.000	0.83	0.0	110.5	SURCHARGED
15.004	208	123.176	0.716	0.000	1.24	0.0	520.5	SURCHARGED
15.005	209	122.789	0.629	0.000	1.58	0.0	519.5	SURCHARGED
15.006	210	122.560	0.460	0.000	0.70	0.0	526.1	SURCHARGED
19.000	211	123.431	0.621	0.000	2.38	0.0	32.5	SURCHARGED
19.001	212	122.814	0.134	0.000	0.94	0.0	32.6	SURCHARGED
19.002	213	122.745	0.125	0.000	0.72	0.0	60.9	SURCHARGED
19.003	214	122.643	0.273	0.000	0.70	0.0	87.2	SURCHARGED
19.004	215	122.565	0.295	0.000	0.18	0.0	107.8	SURCHARGED
19.005	216	122.559	0.419	0.000	0.15	0.0	126.0	SURCHARGED
15.007	217	122.400	0.600	0.000	0.71	0.0	625.9	SURCHARGED
20.000	218	122.534	0.334	0.000	0.55	0.0	45.0	SURCHARGED
20.001	219	122.455	0.425	0.000	0.41	0.0	41.0	SURCHARGED
20.002	220	122.408	0.428	0.000	0.92	0.0	112.8	SURCHARGED
20.003	221	122.314	0.584	0.000	0.85	0.0	244.6	SURCHARGED
15.008	222	122.196	0.716	0.000	1.07	0.0	796.8	SURCHARGED
21.000	223	123.559	-0.071	0.000	0.80	0.0	77.1	OK
21.001	223a	122.582	0.012	0.000	0.94	0.0	102.7	SURCHARGED
15.009	224	121.874	0.664	0.000	0.89	0.0	886.9	SURCHARGED
15.010	225	121.526	0.756	0.000	0.93	0.0	963.0	SURCHARGED
22.000	226	123.881	0.611	0.000	1.61	0.0	159.7	SURCHARGED
22.001	227	122.731	-0.169	0.000	0.57	0.0	217.7	OK
15.011	228	121.497	0.937	0.000	0.08	0.0	73.9	SURCHARGED
15.012	228a	121.496	1.089	0.000	0.08	0.0	74.8	SURCHARGED
23.000	244	124.842	1.437	1.663	0.99	0.0	153.2	FLOOD
23.001	245	124.292	1.447	1.636	2.37	0.0	156.9	FLOOD
23.002	246	124.032	1.257	0.000	1.03	0.0	207.7	FLOOD RISK
23.003	247	123.199	1.194	0.000	2.56	0.0	277.6	SURCHARGED

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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'ed Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	O'flow (l/s)		Flow (l/s)
23.004	248	122.178	0.363	0.000	0.91	0.0	284.3	SURCHARGED
15.013	249	121.496	1.236	0.000	0.12	0.0	93.2	SURCHARGED
15.014	250	121.496	1.276	0.000	0.11	0.0	93.7	SURCHARGED
24.000	251	124.505	1.155	0.000	1.38	0.0	116.9	SURCHARGED
24.001	252	123.198	0.528	0.000	1.51	0.0	127.9	SURCHARGED
24.002	253	122.617	0.197	0.000	1.21	0.0	161.6	SURCHARGED
24.003	254	121.934	-0.086	0.000	0.84	0.0	211.3	OK
15.015	255	121.496	1.326	0.000	0.09	0.0	105.2	SURCHARGED
15.016	256 (HB)	121.496	2.281	0.000	0.24	0.0	6.3	SURCHARGED
1.016	106 (D)	119.527	0.032	0.000	1.20	0.0	220.1	SURCHARGED
1.017	107 (D)	119.455	0.000	0.000	1.34	0.0	217.8	OK
1.018	108 (PI)	119.242	0.007	0.000	1.03	0.0	220.3	SURCHARGED
1.019	109	119.195	0.000	0.000	1.06	0.0	220.4	OK