


Woods Hardwick		Page 1
15-17 Goldington Road Bedford MK40 3NH		
Date 08/08/2016 10:07 File SW Central system (dive...	Designed by a.tew Checked by	
Micro Drainage		Network 2014.1.1

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SWS

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 SWS

- 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	46.310	0.699	66.3	0.462	5.00	0.0	0.600	o	225	
1.001	27.589	0.287	96.1	0.090	0.00	0.0	0.600	o	225	
1.002	19.709	0.161	122.4	0.084	0.00	0.0	0.600	o	225	
1.003	54.656	0.602	90.8	0.024	0.00	0.0	0.600	o	225	
1.004	48.308	0.537	90.0	0.000	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)
1.000	0.00	5.48	125.633	0.462	0.0	0.0	0.0	1.61	64.0	0.0
1.001	0.00	5.82	124.934	0.552	0.0	0.0	0.0	1.33	53.0	0.0
1.002	0.00	6.10	124.647	0.636	0.0	0.0	0.0	1.18	46.9	0.0
1.003	0.00	6.77	124.486	0.660	0.0	0.0	0.0	1.37	54.6	0.0
1.004	0.00	7.25	123.809	0.660	0.0	0.0	0.0	1.66	117.2	0.0

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Network Design Table for SWS
















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
1.005	11.396	0.122	93.4	0.000	0.00	0.0	0.600	o	300	
2.000	9.477	0.311	30.5	0.100	5.00	0.0	0.600	o	150	
2.001	22.265	0.731	30.5	0.049	0.00	0.0	0.600	o	150	
2.002	38.145#	0.302	126.3	0.109	0.00	0.0	0.600	o	150	
2.003	7.222#	0.675	10.7	0.000	0.00	0.0	0.600	o	225	
1.006	59.849	0.160	374.1	0.145	0.00	0.0	0.600	o	450	
3.000	26.967	0.234	115.2	0.105	5.00	0.0	0.600	o	150	
3.001	46.625	0.520	89.7	0.090	0.00	0.0	0.600	o	150	
3.002	4.363	0.018	242.4	0.130	0.00	0.0	0.600	o	150	
3.003	22.819	0.169	135.0	0.076	0.00	0.0	0.600	o	150	
3.004	21.320#	0.119	179.2	0.060	0.00	0.0	0.600	o	150	
4.000	71.622	0.359	199.5	0.175	5.00	0.0	0.600	o	150	
3.005	27.060#	0.185	146.3	0.000	0.00	0.0	0.600	o	450	
5.000	8.420#	0.093	90.5	0.057	5.00	0.0	0.600	o	150	
3.006	40.137	0.227	176.8	0.057	0.00	0.0	0.600	o	450	

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)
1.005	0.00	7.37	123.272	0.660	0.0	0.0	0.0	1.63	115.0	0.0
2.000	0.00	5.09	125.319	0.100	0.0	0.0	0.0	1.83	32.3	0.0
2.001	0.00	5.29	125.008	0.149	0.0	0.0	0.0	1.83	32.4	0.0
2.002	0.00	6.00	124.277	0.258	0.0	0.0	0.0	0.89	15.8	0.0
2.003	0.00	6.03	123.900	0.258	0.0	0.0	0.0	4.02	160.0	0.0
1.006	0.00	8.32	123.000	1.063	0.0	0.0	0.0	1.05	166.2	0.0
3.000	0.00	5.48	126.002	0.105	0.0	0.0	0.0	0.94	16.5	0.0
3.001	0.00	6.21	125.768	0.195	0.0	0.0	0.0	1.06	18.8	0.0
3.002	0.00	6.33	125.248	0.325	0.0	0.0	0.0	0.64	11.3	0.0
3.003	0.00	6.77	125.230	0.401	0.0	0.0	0.0	0.86	15.3	0.0
3.004	0.00	7.24	125.061	0.461	0.0	0.0	0.0	0.75	13.2	0.0
4.000	0.00	6.69	125.351	0.175	0.0	0.0	0.0	0.71	12.5	0.0
3.005	0.00	7.51	124.892	0.636	0.0	0.0	0.0	1.68	267.0	0.0
5.000	0.00	5.13	125.100	0.057	0.0	0.0	0.0	1.06	18.7	0.0
3.006	0.00	7.95	124.707	0.750	0.0	0.0	0.0	1.53	242.7	0.0

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Network Design Table for SWS

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
3.007	20.544	0.085	241.7	0.074	0.00	0.0	0.600	o	450	
3.008	7.935	1.330	6.0	0.000	0.00	0.0	0.600	o	225	
6.000	8.698	0.037	235.1	0.000	5.00	0.0	0.600	o	300	
6.001	24.347	0.063	386.5	0.000	0.00	0.0	0.600	o	450	
1.007	37.392	0.253	147.8	0.069	0.00	0.0	0.600	o	150	
7.000	12.065#	0.453	26.6	0.036	5.00	0.0	0.600	o	100	
7.001	33.946#	0.418	81.2	0.060	0.00	0.0	0.600	o	100	
7.002	24.933	0.375	66.5	0.042	0.00	0.0	0.600	o	150	
7.003	12.230	0.045	271.8	0.045	0.00	0.0	0.600	o	150	
8.000	11.634	0.383	30.4	0.061	5.00	0.0	0.600	o	100	
7.004	48.302	0.600	80.5	0.055	0.00	0.0	0.600	o	150	
7.005	39.390	0.653	60.3	0.000	0.00	0.0	0.600	o	150	
1.008	13.653	0.092	148.4	0.000	0.00	0.0	0.600	o	150	
1.009	29.758	0.157	189.5	0.000	0.00	0.0	0.600	o	225	
9.000	49.037	0.490	100.1	0.102	5.00	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)
3.007	0.00	8.21	124.480	0.824	0.0	0.0	0.0	1.30	207.3	0.0
3.008	0.00	8.24	124.395	0.824	0.0	0.0	0.0	5.39	214.4	0.0
6.000	0.00	5.14	122.940	0.000	0.0	0.0	0.0	1.02	72.2	0.0
6.001	0.00	5.54	122.903	0.000	0.0	0.0	0.0	1.03	163.5	0.0
1.007	0.00	9.08	122.840	1.956	0.0	0.0	0.0	0.82	14.6	0.0
7.000	0.00	5.13	125.181	0.036	0.0	0.0	0.0	1.50	11.8	0.0
7.001	0.00	5.80	124.728	0.096	0.0	0.0	0.0	0.85	6.7	0.0
7.002	0.00	6.13	124.260	0.138	0.0	0.0	0.0	1.24	21.8	0.0
7.003	0.00	6.47	123.885	0.183	0.0	0.0	0.0	0.60	10.7	0.0
8.000	0.00	5.14	124.273	0.061	0.0	0.0	0.0	1.41	11.0	0.0
7.004	0.00	7.19	123.840	0.299	0.0	0.0	0.0	1.12	19.8	0.0
7.005	0.00	7.69	123.240	0.299	0.0	0.0	0.0	1.30	22.9	0.0
1.008	0.00	9.36	122.587	2.255	0.0	0.0	0.0	0.82	14.5	0.0
1.009	0.00	9.88	122.420	2.255	0.0	0.0	0.0	0.95	37.6	0.0
9.000	0.00	5.52	122.870	0.102	0.0	0.0	0.0	1.57	111.1	0.0

Network Design Table for SWS
















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
9.001	3.625	0.042	86.3	0.000	0.00	0.0	0.600	o	150	
1.010	23.462	0.160	146.6	0.030	0.00	0.0	0.600	o	225	
10.000	15.760	0.100	157.6	0.030	5.00	0.0	0.600	o	225	
10.001	13.900	0.090	154.4	0.030	0.00	0.0	0.600	o	225	
10.002	26.250	0.160	164.1	0.030	0.00	0.0	0.600	o	225	
10.003	23.160	0.140	165.4	0.037	0.00	0.0	0.600	o	225	
10.004	21.300	0.130	163.8	0.030	0.00	0.0	0.600	o	225	
10.005	12.120	0.075	161.6	0.000	0.00	0.0	0.600	o	225	
10.006	16.610	0.090	184.6	0.030	0.00	0.0	0.600	o	300	
11.000	9.110	0.050	182.2	0.035	5.00	0.0	0.600	o	300	
10.007	6.510	0.030	217.0	0.000	0.00	0.0	0.600	o	300	
10.008	12.600	0.060	210.0	0.030	0.00	0.0	0.600	o	300	
10.009	28.830	0.130	221.8	0.010	0.00	0.0	0.600	o	300	
10.010	23.380	0.110	212.5	0.038	0.00	0.0	0.600	o	300	
10.011	9.000	0.102	88.2	0.000	0.00	0.0	0.600	o	150	
1.011	14.060	0.079	178.0	0.000	0.00	0.0	0.600	o	225	
1.012	74.443	1.113	66.9	0.046	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)
9.001	0.00	5.58	122.380	0.102	0.0	0.0	0.0	1.08	19.1	0.0
1.010	0.00	10.24	122.263	2.387	0.0	0.0	0.0	1.08	42.8	0.0
10.000	0.00	5.25	123.470	0.030	0.0	0.0	0.0	1.04	41.3	0.0
10.001	0.00	5.47	123.370	0.060	0.0	0.0	0.0	1.05	41.7	0.0
10.002	0.00	5.90	123.280	0.090	0.0	0.0	0.0	1.02	40.5	0.0
10.003	0.00	6.28	123.120	0.127	0.0	0.0	0.0	1.01	40.3	0.0
10.004	0.00	6.63	122.980	0.157	0.0	0.0	0.0	1.02	40.5	0.0
10.005	0.00	6.83	122.850	0.157	0.0	0.0	0.0	1.03	40.8	0.0
10.006	0.00	7.07	122.700	0.187	0.0	0.0	0.0	1.15	81.6	0.0
11.000	0.00	5.13	122.660	0.035	0.0	0.0	0.0	1.16	82.1	0.0
10.007	0.00	7.17	122.610	0.222	0.0	0.0	0.0	1.06	75.2	0.0
10.008	0.00	7.37	122.580	0.252	0.0	0.0	0.0	1.08	76.4	0.0
10.009	0.00	7.82	122.520	0.262	0.0	0.0	0.0	1.05	74.3	0.0
10.010	0.00	8.19	122.390	0.300	0.0	0.0	0.0	1.07	76.0	0.0
10.011	0.00	8.33	122.280	0.300	0.0	0.0	0.0	1.07	18.9	0.0
1.011	0.00	10.48	122.103	2.687	0.0	0.0	0.0	0.98	38.8	0.0
1.012	0.00	11.26	122.024	2.733	0.0	0.0	0.0	1.60	63.7	0.0

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Network Design Table for SWS

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
12.000	1.770	0.180	9.8	0.037	5.00	0.0	0.600	o	150	
12.001	8.180	0.760	10.8	0.000	0.00	0.0	0.600	o	150	
13.000	1.000	0.010	100.0	0.016	5.00	0.0	0.600	o	150	
13.001	6.940	0.454	15.3	0.000	0.00	0.0	0.600	o	150	
1.013	38.178	0.321	118.9	0.021	0.00	0.0	0.600	o	225	
1.014	39.956	0.269	148.5	0.012	0.00	0.0	0.600	oo	-1	
1.015	14.126	0.079	178.8	0.015	0.00	0.0	0.600	oo	-1	
14.000	16.816	0.095	177.0	0.000	5.00	0.0	0.600	o	300	
14.001	23.092	0.066	349.9	0.070	0.00	0.0	0.600	o	300	
15.000	7.219	0.024	300.8	0.080	5.00	0.0	0.600	o	300	
14.002	37.034	0.553	67.0	0.020	0.00	0.0	0.600	o	450	
14.003	22.412	0.230	97.4	0.080	0.00	0.0	0.600	o	450	
14.004	12.749	0.110	115.9	0.000	0.00	0.0	0.600	o	300	
14.005	21.721	0.325	66.8	0.027	0.00	0.0	0.600	o	300	
16.000	30.605	0.313	97.8	0.020	5.00	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)
12.000	0.00	5.01	122.510	0.037	0.0	0.0	0.0	3.23	57.1	0.0
12.001	0.00	5.05	122.330	0.037	0.0	0.0	0.0	3.09	54.6	0.0
13.000	0.00	5.02	121.450	0.016	0.0	0.0	0.0	1.00	17.8	0.0
13.001	0.00	5.06	121.440	0.016	0.0	0.0	0.0	2.59	45.8	0.0
1.013	0.00	11.79	120.911	2.807	0.0	0.0	0.0	1.20	47.6	0.0
1.014	0.00	12.41	120.590	2.819	0.0	0.0	0.0	1.07	85.6	0.0
1.015	0.00	12.65	120.321	2.834	0.0	0.0	0.0	0.97	78.0	0.0
14.000	0.00	5.24	122.676	0.000	0.0	0.0	0.0	1.18	83.3	0.0
14.001	0.00	5.70	122.581	0.070	0.0	0.0	0.0	0.83	59.0	0.0
15.000	0.00	5.13	122.539	0.080	0.0	0.0	0.0	0.90	63.7	0.0
14.002	0.00	5.95	122.515	0.170	0.0	0.0	0.0	2.49	395.6	0.0
14.003	0.00	6.13	121.962	0.250	0.0	0.0	0.0	2.06	327.6	0.0
14.004	0.00	6.27	121.732	0.250	0.0	0.0	0.0	1.46	103.2	0.0
14.005	0.00	6.46	121.622	0.277	0.0	0.0	0.0	1.93	136.1	0.0
16.000	0.00	5.50	121.610	0.020	0.0	0.0	0.0	1.02	18.0	0.0

Network Design Table for SWS


















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
17.000	52.101	0.591	88.2	0.040	5.00	0.0	0.600	o	100	
17.001	27.999	0.358	78.2	0.056	0.00	0.0	0.600	o	150	
14.006	17.974	1.055	17.0	0.010	0.00	0.0	0.600	o	225	
1.016	27.337	0.141	193.9	0.047	0.00	0.0	0.600	oo	-1	
1.017	8.947	0.284	31.5	0.000	0.00	0.0	0.600	oo	-1	
1.018	66.119	0.710	93.1	0.066	0.00	0.0	0.600	o	225	
1.019	47.865	0.330	145.0	0.066	0.00	0.0	0.600	o	225	
1.020	8.672	0.025	346.9	0.000	0.00	0.0	0.600	o	225	
1.021	14.635	0.213	68.7	0.000	0.00	0.0	0.600	o	300	
18.000	27.683	0.135	205.1	0.042	5.00	0.0	0.600	o	100	
1.022	22.832	0.217	105.2	0.084	0.00	0.0	0.600	o	300	
1.023	26.267	0.872	30.1	0.000	0.00	0.0	0.600	o	300	
1.024	29.755	0.125	238.0	0.000	0.00	0.0	0.600	o	300	
1.025	18.085#	0.075	241.1	0.000	0.00	0.0	0.600	o	300	
19.000	11.820#	0.210	56.3	0.037	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)
17.000	0.00	6.06	122.246	0.040	0.0	0.0	0.0	0.82	6.4	0.0
17.001	0.00	6.47	121.655	0.096	0.0	0.0	0.0	1.14	20.1	0.0
14.006	0.00	6.56	121.297	0.403	0.0	0.0	0.0	3.19	126.7	0.0
1.016	0.00	13.14	120.242	3.284	0.0	0.0	0.0	0.94	74.8	0.0
1.017	0.00	13.20	120.101	3.284	0.0	0.0	0.0	2.34	187.1	0.0
1.018	0.00	14.02	119.817	3.350	0.0	0.0	0.0	1.36	53.9	0.0
1.019	0.00	14.75	119.107	3.416	0.0	0.0	0.0	1.08	43.1	0.0
1.020	0.00	14.96	118.777	3.416	0.0	0.0	0.0	0.70	27.7	0.0
1.021	0.00	15.09	118.752	3.416	0.0	0.0	0.0	1.90	134.3	0.0
18.000	0.00	5.87	118.874	0.042	0.0	0.0	0.0	0.53	4.2	0.0
1.022	0.00	15.34	118.539	3.542	0.0	0.0	0.0	1.53	108.3	0.0
1.023	0.00	15.49	118.322	3.542	0.0	0.0	0.0	2.88	203.2	0.0
1.024	0.00	15.98	117.450	3.542	0.0	0.0	0.0	1.01	71.7	0.0
1.025	0.00	16.28	117.325	3.542	0.0	0.0	0.0	1.01	71.3	0.0
19.000	0.00	5.11	117.975	0.037	0.0	0.0	0.0	1.75	69.5	0.0

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Network Design Table for SWS

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
20.000	88.500#	0.970	91.2	0.114	5.00	0.0	0.600	o	225	
20.001	18.920#	0.200	94.6	0.000	0.00	0.0	0.600	o	225	
20.002	36.550#	1.255	29.1	0.020	0.00	0.0	0.600	o	225	
20.003	23.948#	0.310	77.3	0.051	0.00	0.0	0.600	o	225	
19.001	24.910#	0.160	155.7	0.032	0.00	0.0	0.600	o	300	
19.002	25.528#	0.140	182.3	0.039	0.00	0.0	0.600	o	300	
19.003	8.369#	0.085	98.5	0.000	0.00	0.0	0.600	oo	-4	
19.004	12.878#	0.055	234.1	0.000	0.00	0.0	0.600	o	300	
1.026	23.505#	0.100	235.1	0.000	0.00	0.0	0.600	o	300	
1.027	21.756#	0.100	217.6	0.000	0.00	0.0	0.600	o	300	
1.028	10.222#	0.050	204.4	0.000	0.00	0.0	0.600	o	300	
1.029	18.779#	0.102	184.1	0.000	0.00	0.0	0.600	o	300	
21.000	45.191#	0.190	237.8	0.090	5.00	0.0	0.600	o	300	
22.000	8.916#	0.050	178.3	0.100	5.00	0.0	0.600	o	300	
22.001	14.955#	0.070	213.6	0.100	0.00	0.0	0.600	o	300	
22.002	31.564#	0.140	225.5	0.119	0.00	0.0	0.600	oo	43	
22.003	12.952#	0.050	259.0	0.000	0.00	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)
20.000	0.00	6.08	120.500	0.114	0.0	0.0	0.0	1.37	54.4	0.0
20.001	0.00	6.31	119.530	0.114	0.0	0.0	0.0	1.34	53.5	0.0
20.002	0.00	6.56	119.330	0.134	0.0	0.0	0.0	2.43	96.8	0.0
20.003	0.00	6.83	118.075	0.185	0.0	0.0	0.0	1.49	59.2	0.0
19.001	0.00	7.16	117.690	0.254	0.0	0.0	0.0	1.26	88.9	0.0
19.002	0.00	7.53	117.530	0.293	0.0	0.0	0.0	1.16	82.1	0.0
19.003	0.00	7.66	117.390	0.293	0.0	0.0	0.0	1.01	35.4	0.0
19.004	0.00	7.87	117.305	0.293	0.0	0.0	0.0	1.02	72.3	0.0
1.026	0.00	16.66	117.250	3.835	0.0	0.0	0.0	1.02	72.2	0.0
1.027	0.00	17.00	117.150	3.835	0.0	0.0	0.0	1.06	75.1	0.0
1.028	0.00	17.16	117.050	3.835	0.0	0.0	0.0	1.10	77.5	0.0
1.029	0.00	17.43	117.000	3.835	0.0	0.0	0.0	1.16	81.7	0.0
21.000	0.00	5.74	119.100	0.090	0.0	0.0	0.0	1.02	71.8	0.0
22.000	0.00	5.13	119.370	0.100	0.0	0.0	0.0	1.17	83.0	0.0
22.001	0.00	5.36	119.320	0.200	0.0	0.0	0.0	1.07	75.8	0.0
22.002	0.00	5.75	119.100	0.319	0.0	0.0	0.0	1.35	429.2	0.0
22.003	0.00	5.97	118.960	0.319	0.0	0.0	0.0	0.97	68.7	0.0

Network Design Table for SWS














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
21.001	75.871#	0.270	281.0	0.074	0.00	0.0	0.600	o	450	
23.000	14.667#	0.090	163.0	0.100	5.00	0.0	0.600	o	225	
23.001	7.980#	0.050	159.6	0.100	0.00	0.0	0.600	o	300	
23.002	35.000#	0.180	194.4	0.121	0.00	0.0	0.600	oo	42	
23.003	14.500#	0.080	181.3	0.000	0.00	0.0	0.600	o	300	
21.002	25.245#	0.090	280.5	0.000	0.00	0.0	0.600	o	450	
21.003	16.985#	0.060	283.1	0.046	0.00	0.0	0.600	o	450	
21.004	3.977#	0.015	265.1	0.000	0.00	0.0	0.600	o	450	
24.000	15.528#	0.300	51.8	0.064	5.00	0.0	0.600	o	300	
24.001	37.970#	0.690	55.0	0.057	0.00	0.0	0.600	o	300	
25.000	8.500#	0.050	170.0	0.047	5.00	0.0	0.600	oo	41	
24.002	12.474#	0.050	249.5	0.112	0.00	0.0	0.600	o	600	
24.003	8.990#	0.060	149.8	0.000	0.00	0.0	0.600	o	375	
21.005	26.290#	0.095	276.7	0.000	0.00	0.0	0.600	o	450	
21.006	16.985#	0.075	226.5	0.000	0.00	0.0	0.600	o	450	
21.007	15.017#	0.035	429.1	0.052	0.00	0.0	0.600	o	600	

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)
21.001	0.00	7.02	118.760	0.483	0.0	0.0	0.0	1.21	192.1	0.0
23.000	0.00	5.24	119.190	0.100	0.0	0.0	0.0	1.02	40.6	0.0
23.001	0.00	5.35	119.025	0.200	0.0	0.0	0.0	1.24	87.8	0.0
23.002	0.00	5.80	118.900	0.321	0.0	0.0	0.0	1.30	286.5	0.0
23.003	0.00	6.00	118.720	0.321	0.0	0.0	0.0	1.16	82.3	0.0
21.002	0.00	7.37	118.490	0.804	0.0	0.0	0.0	1.21	192.3	0.0
21.003	0.00	7.60	118.400	0.850	0.0	0.0	0.0	1.20	191.4	0.0
21.004	0.00	7.65	118.340	0.850	0.0	0.0	0.0	1.24	197.8	0.0
24.000	0.00	5.12	119.800	0.064	0.0	0.0	0.0	2.19	154.8	0.0
24.001	0.00	5.42	119.500	0.121	0.0	0.0	0.0	2.12	150.1	0.0
25.000	0.00	5.12	118.860	0.047	0.0	0.0	0.0	1.20	169.3	0.0
24.002	0.00	5.55	118.510	0.280	0.0	0.0	0.0	1.54	434.6	0.0
24.003	0.00	5.65	118.460	0.280	0.0	0.0	0.0	1.48	163.2	0.0
21.005	0.00	8.01	118.325	1.130	0.0	0.0	0.0	1.22	193.6	0.0
21.006	0.00	8.22	118.230	1.130	0.0	0.0	0.0	1.35	214.2	0.0
21.007	0.00	8.44	118.005	1.182	0.0	0.0	0.0	1.17	330.6	0.0


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Network Design Table for SWS















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
26.000	16.432#	0.100	164.3	0.082	5.00	0.0	0.600	o	225	
26.001	29.945#	0.060	499.1	0.100	0.00	0.0	0.600	o	600	
27.000	24.172#	0.060	402.9	0.056	5.00	0.0	0.600	o	600	
26.002	14.980#	0.030	499.3	0.000	0.00	0.0	0.600	o	750	
21.008	67.596#	0.104	650.0	0.067	0.00	0.0	0.600	o	750	
28.000	4.430#	0.014	316.4	0.111	5.00	0.0	0.600	o	525	
21.009	33.583#	0.051	658.5	0.109	0.00	0.0	0.600	o	750	
21.010	18.617#	0.030	620.6	0.132	0.00	0.0	0.600	o	750	
29.000	8.280#	0.105	78.9	0.071	5.00	0.0	0.600	o	225	
29.001	43.660#	0.210	207.9	0.062	0.00	0.0	0.600	o	300	
29.002	35.845#	0.160	224.0	0.020	0.00	0.0	0.600	o	300	
29.003	17.110#	0.670	25.5	0.088	0.00	0.0	0.600	o	300	
30.000	27.055#	0.080	338.2	0.130	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)
26.000	0.00	5.27	118.535	0.082	0.0	0.0	0.0	1.02	40.4	0.0
26.001	0.00	5.73	118.060	0.182	0.0	0.0	0.0	1.08	306.3	0.0
27.000	0.00	5.33	118.060	0.056	0.0	0.0	0.0	1.21	341.3	0.0
26.002	0.00	5.93	117.850	0.238	0.0	0.0	0.0	1.25	550.2	0.0
21.008	0.00	9.47	117.820	1.487	0.0	0.0	0.0	1.09	481.6	0.0
28.000	0.00	5.06	117.955	0.111	0.0	0.0	0.0	1.25	271.4	0.0
21.009	0.00	9.99	117.716	1.707	0.0	0.0	0.0	1.08	478.4	0.0
21.010	0.00	10.27	117.665	1.839	0.0	0.0	0.0	1.12	493.0	0.0
29.000	0.00	5.09	121.750	0.071	0.0	0.0	0.0	1.47	58.6	0.0
29.001	0.00	5.76	121.570	0.133	0.0	0.0	0.0	1.09	76.8	0.0
29.002	0.00	6.33	121.360	0.153	0.0	0.0	0.0	1.05	74.0	0.0
29.003	0.00	6.43	121.200	0.241	0.0	0.0	0.0	3.12	220.8	0.0
30.000	0.00	5.30	120.800	0.130	0.0	0.0	0.0	1.52	669.8	0.0


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Network Design Table for SWS
















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
31.000	19.140#	0.040	478.5	0.076	5.00	0.0	0.600	o	750	
30.001	45.605#	0.080	570.1	0.063	0.00	0.0	0.600	o	750	
30.002	7.091#	0.110	64.5	0.000	0.00	0.0	0.600	o	300	
29.004	19.900#	0.090	221.1	0.030	0.00	0.0	0.600	o	300	
29.005	29.530#	0.130	227.2	0.030	0.00	0.0	0.600	o	300	
32.000	20.790#	0.060	346.5	0.178	5.00	0.0	0.600	o	450	
33.000	22.163#	0.110	201.5	0.009	5.00	0.0	0.600	o	450	
32.001	44.268#	0.080	553.4	0.060	0.00	0.0	0.600	o	600	
32.002	6.932#	0.350	19.8	0.000	0.00	0.0	0.600	o	300	
29.006	68.040#	0.470	144.8	0.093	0.00	0.0	0.600	o	375	
29.007	37.480#	0.560	66.9	0.132	0.00	0.0	0.600	o	375	
29.008	11.948#	0.190	62.9	0.128	0.00	0.0	0.600	o	450	
34.000	3.600#	0.030	120.0	0.050	5.00	0.0	0.600	o	300	
34.001	11.654#	0.880	13.2	0.000	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)
31.000	0.00	5.25	120.760	0.076	0.0	0.0	0.0	1.27	562.2	0.0
30.001	0.00	5.95	120.720	0.269	0.0	0.0	0.0	1.16	514.6	0.0
30.002	0.00	6.01	120.640	0.269	0.0	0.0	0.0	1.96	138.6	0.0
29.004	0.00	6.74	120.530	0.540	0.0	0.0	0.0	1.05	74.5	0.0
29.005	0.00	7.21	120.440	0.570	0.0	0.0	0.0	1.04	73.4	0.0
32.000	0.00	5.32	120.950	0.178	0.0	0.0	0.0	1.09	172.8	0.0
33.000	0.00	5.26	121.000	0.009	0.0	0.0	0.0	1.43	227.2	0.0
32.001	0.00	6.04	120.740	0.247	0.0	0.0	0.0	1.03	290.7	0.0
32.002	0.00	6.07	120.660	0.247	0.0	0.0	0.0	3.55	250.9	0.0
29.006	0.00	7.97	120.235	0.910	0.0	0.0	0.0	1.50	166.1	0.0
29.007	0.00	8.25	119.765	1.042	0.0	0.0	0.0	2.22	244.9	0.0
29.008	0.00	8.33	119.130	1.170	0.0	0.0	0.0	2.57	408.3	0.0
34.000	0.00	5.04	120.150	0.050	0.0	0.0	0.0	1.43	101.4	0.0
34.001	0.00	5.11	120.120	0.050	0.0	0.0	0.0	2.78	49.2	0.0


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Network Design Table for SWS














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
29.009	65.185#	0.940	69.3	0.050	0.00	0.0	0.600	o	450	
35.000	51.632#	0.360	143.4	0.132	5.00	0.0	0.600	o	300	
35.001	4.880#	0.050	97.6	0.050	0.00	0.0	0.600	o	300	
36.000	16.273#	0.080	203.4	0.030	5.00	0.0	0.600	o	375	
35.002	17.330#	0.100	173.3	0.083	0.00	0.0	0.600	o	600	
35.003	25.500#	0.090	283.3	0.056	0.00	0.0	0.600	o	600	
35.004	6.480#	0.150	43.2	0.000	0.00	0.0	0.600	o	300	
29.010	29.819#	0.065	458.8	0.047	0.00	0.0	0.600	o	600	
37.000	18.144#	0.120	151.2	0.034	5.00	0.0	0.600	o	375	
37.001	18.124#	0.295	61.4	0.034	0.00	0.0	0.600	o	300	
21.011	23.889#	0.040	597.2	0.076	0.00	0.0	0.600	o	750	
21.012	7.756#	0.035	221.6	0.000	0.00	0.0	0.600	o	750	
38.000	17.551#	0.090	195.0	0.035	5.00	0.0	0.600	o	300	
38.001	17.392#	0.085	204.6	0.038	0.00	0.0	0.600	o	300	
38.002	16.123#	0.065	248.0	0.038	0.00	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)
29.009	0.00	8.77	118.940	1.270	0.0	0.0	0.0	2.44	388.7	0.0
35.000	0.00	5.66	119.200	0.132	0.0	0.0	0.0	1.31	92.7	0.0
35.001	0.00	5.71	118.840	0.182	0.0	0.0	0.0	1.59	112.5	0.0
36.000	0.00	5.21	118.795	0.030	0.0	0.0	0.0	1.27	139.9	0.0
35.002	0.00	5.86	118.490	0.295	0.0	0.0	0.0	1.85	522.2	0.0
35.003	0.00	6.16	118.390	0.351	0.0	0.0	0.0	1.44	407.6	0.0
35.004	0.00	6.20	118.300	0.351	0.0	0.0	0.0	2.40	169.6	0.0
29.010	0.00	9.21	117.850	1.668	0.0	0.0	0.0	1.13	319.6	0.0
37.000	0.00	5.21	118.500	0.034	0.0	0.0	0.0	1.47	162.5	0.0
37.001	0.00	5.36	118.380	0.068	0.0	0.0	0.0	2.01	142.0	0.0
21.011	0.00	10.62	117.635	3.651	0.0	0.0	0.0	1.14	502.7	0.0
21.012	0.00	10.69	117.595	3.651	0.0	0.0	0.0	1.88	828.7	0.0
38.000	0.00	5.26	118.300	0.035	0.0	0.0	0.0	1.12	79.3	0.0
38.001	0.00	5.53	118.210	0.073	0.0	0.0	0.0	1.10	77.4	0.0
38.002	0.00	5.80	118.125	0.111	0.0	0.0	0.0	0.99	70.2	0.0

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Network Design Table for SWS

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38.003	13.713#	0.050	274.3	0.000	0.00	0.0	0.600	o	300	
39.000	52.116#	0.670	77.8	0.100	5.00	0.0	0.600	o	300	
21.013	33.095#	0.065	509.2	0.000	0.00	0.0	0.600	o	750	
40.000	36.503#	0.085	429.4	0.069	5.00	0.0	0.600	o	900	
21.014	18.722#	0.095	197.1	0.015	0.00	0.0	0.600	o	900	
41.000	15.090#	0.030	503.0	0.090	5.00	0.0	0.600	o	900	
21.015	23.110#	0.030	770.3	0.020	0.00	0.0	0.600	o	900	
21.016	13.416#	0.030	447.2	0.040	0.00	0.0	0.600	o	900	
21.017	14.567#	0.030	485.6	0.040	0.00	0.0	0.600	o	900	
21.018	6.492#	0.030	216.4	0.046	0.00	0.0	0.600	o	900	
42.000	14.400#	0.050	288.0	0.040	5.00	0.0	0.600	o	450	
21.019	18.010#	0.095	189.6	0.000	0.00	0.0	0.600	o	375	
21.020	9.500#	0.137	69.3	0.044	0.00	0.0	0.600	o	375	

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)
38.003	0.00	6.04	118.060	0.111	0.0	0.0	0.0	0.94	66.8	0.0
39.000	0.00	5.49	118.230	0.100	0.0	0.0	0.0	1.78	126.1	0.0
21.013	0.00	11.13	117.560	3.862	0.0	0.0	0.0	1.23	544.9	0.0
40.000	0.00	5.40	117.430	0.069	0.0	0.0	0.0	1.51	957.8	0.0
21.014	0.00	11.27	117.345	3.946	0.0	0.0	0.0	2.23	1417.7	0.0
41.000	0.00	5.18	117.280	0.090	0.0	0.0	0.0	1.39	884.4	0.0
21.015	0.00	11.62	117.250	4.056	0.0	0.0	0.0	1.12	713.1	0.0
21.016	0.00	11.77	117.220	4.096	0.0	0.0	0.0	1.48	938.4	0.0
21.017	0.00	11.94	117.190	4.136	0.0	0.0	0.0	1.42	900.3	0.0
21.018	0.00	11.99	117.160	4.182	0.0	0.0	0.0	2.13	1352.5	0.0
42.000	0.00	5.20	117.180	0.040	0.0	0.0	0.0	1.19	189.7	0.0
21.019	0.00	12.22	117.130	4.222	0.0	0.0	0.0	1.31	145.0	0.0
21.020	0.00	12.29	117.035	4.266	0.0	0.0	0.0	2.18	240.6	0.0







Network Design Table for SWS

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
43.000	8.382#	0.077	108.9	0.040	5.00	0.0	0.600	o	150	
1.030	8.406#	0.081	103.8	0.030	0.00	0.0	0.600	o	375	
1.031	21.272	0.239	89.0	0.000	0.00	0.0	0.600	o	375	
1.032	9.900	0.108	91.7	0.032	0.00	0.0	0.600	o	375	
44.000	33.338#	0.200	166.7	0.119	5.00	0.0	0.600	o	300	
44.001	37.692#	0.160	235.6	0.100	0.00	0.0	0.600	o	300	
44.002	26.668#	0.110	242.4	0.039	0.00	0.0	0.600	o	300	
44.003	13.050	0.055	237.3	0.071	0.00	0.0	0.600	o	300	
45.000	8.820	0.100	88.2	0.010	5.00	0.0	0.600	o	225	
45.001	1.000	0.010	100.0	0.000	0.00	0.0	0.600	\	-3	
46.000	35.000#	0.110	318.2	0.098	5.00	0.0	0.600	o	375	
46.001	8.580	0.030	286.0	0.051	0.00	0.0	0.600	o	375	
46.002	14.670	0.040	366.8	0.100	0.00	0.0	0.600	o	375	
45.002	30.540#	0.080	381.8	0.000	0.00	0.0	0.600	\	-3	
45.003	21.500#	0.180	119.4	0.000	0.00	0.0	0.600	o	150	
45.004	10.000	0.090	111.1	0.000	0.00	0.0	0.600	o	150	
45.005	91.800#	0.600	153.0	0.000	0.00	0.0	0.600	\	-3	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
43.000	0.00	5.15	117.200	0.040	0.0	0.0	0.0	0.96	17.0	0.0
1.030	0.00	17.51	116.898	8.171	0.0	0.0	0.0	1.78	196.4	0.0
1.031	0.00	17.69	116.817	8.171	0.0	0.0	0.0	1.92	212.2	0.0
1.032	0.00	17.78	116.578	8.203	0.0	0.0	0.0	1.89	209.1	0.0
44.000	0.00	5.46	117.140	0.119	0.0	0.0	0.0	1.21	85.9	0.0
44.001	0.00	6.07	116.940	0.219	0.0	0.0	0.0	1.02	72.1	0.0
44.002	0.00	6.52	116.780	0.258	0.0	0.0	0.0	1.01	71.1	0.0
44.003	0.00	6.73	116.670	0.329	0.0	0.0	0.0	1.02	71.8	0.0
45.000	0.00	5.11	119.000	0.010	0.0	0.0	0.0	1.39	55.4	0.0
45.001	0.00	5.11	118.900	0.010	0.0	0.0	0.0	3.38	4689.2	0.0
46.000	0.00	5.58	119.030	0.098	0.0	0.0	0.0	1.01	111.6	0.0
46.001	0.00	5.71	118.920	0.149	0.0	0.0	0.0	1.07	117.8	0.0
46.002	0.00	5.97	118.890	0.249	0.0	0.0	0.0	0.94	103.8	0.0
45.002	0.00	6.27	118.850	0.259	0.0	0.0	0.0	1.73	2391.3	0.0
45.003	0.00	6.66	118.770	0.259	0.0	0.0	0.0	0.92	16.2	0.0
45.004	0.00	6.83	118.590	0.259	0.0	0.0	0.0	0.95	16.8	0.0
45.005	0.00	7.39	118.500	0.259	0.0	0.0	0.0	2.73	3787.6	0.0

Network Design Table for SWS

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
45.006	5.700	1.060	5.4	0.000	0.00	0.0	0.600	o	150	
44.004	31.768#	0.120	264.7	0.000	0.00	0.0	0.600	o	375	
44.005	4.489	0.025	179.6	0.000	0.00	0.0	0.600	o	375	
1.033	8.579	0.135	63.5	0.000	0.00	0.0	0.600	o	375	
1.034	28.710#	0.160	179.4	0.000	0.00	0.0	0.600	o	450	
1.035	5.466#	0.210	26.0	0.000	0.00	0.0	0.600	o	450	

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)
45.006	0.00	7.41	117.900	0.259	0.0	0.0	0.0	4.38	77.3	0.0
44.004	0.00	7.89	116.615	0.588	0.0	0.0	0.0	1.11	122.5	0.0
44.005	0.00	7.95	116.495	0.588	0.0	0.0	0.0	1.35	149.0	0.0
1.033	0.00	17.84	116.470	8.791	0.0	0.0	0.0	2.28	251.4	0.0
1.034	0.00	18.16	116.260	8.791	0.0	0.0	0.0	1.51	240.9	0.0
1.035	0.00	18.18	116.010	8.791	0.0	0.0	0.0	4.00	635.8	0.0

Free Flowing Outfall Details for SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.035	Outfall	116.600	115.800	121.405	0	0
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Simulation Criteria for SWS

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /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	36
Number of Online Controls	18	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model FEH
Return Period (years) 100

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Synthetic Rainfall Details

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 SWS

Hydro-Brake® Manhole: SC6, DS/PN: 1.007, Volume (m³): 26.3

Design Head (m) 1.200 Hydro-Brake® Type Md6 SW Only Invert Level (m) 122.840
 Design Flow (l/s) 10.0 Diameter (mm) 126

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.1	1.200	9.9	3.000	15.7	7.000	24.0
0.200	8.0	1.400	10.7	3.500	16.9	7.500	24.8
0.300	8.5	1.600	11.5	4.000	18.1	8.000	25.6
0.400	8.1	1.800	12.2	4.500	19.2	8.500	26.4
0.500	7.8	2.000	12.8	5.000	20.3	9.000	27.2
0.600	7.8	2.200	13.4	5.500	21.2	9.500	27.9
0.800	8.3	2.400	14.0	6.000	22.2		
1.000	9.1	2.600	14.6	6.500	23.1		

Orifice Manhole: 12 (B6), DS/PN: 10.011, Volume (m³): 5.3

Diameter (m) 0.046 Discharge Coefficient 0.600 Invert Level (m) 122.280

Orifice Manhole: 13 (B6), DS/PN: 12.001, Volume (m³): 2.2

Diameter (m) 0.027 Discharge Coefficient 0.600 Invert Level (m) 122.330

Orifice Manhole: 14 (B6), DS/PN: 13.001, Volume (m³): 3.1


Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 121.440

Hydro-Brake® Manhole: 70 (D4b), DS/PN: 19.002, Volume (m³): 4.7

Design Head (m) 0.900 Hydro-Brake® Type Md6 SW Only Invert Level (m) 117.530
 Design Flow (l/s) 26.0 Diameter (mm) 203

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.8	1.200	26.9	3.000	40.7	7.000	62.2
0.200	17.6	1.400	28.4	3.500	44.0	7.500	64.4
0.300	25.5	1.600	30.0	4.000	47.0	8.000	66.5
0.400	27.8	1.800	31.7	4.500	49.9	8.500	68.5
0.500	27.9	2.000	33.3	5.000	52.6	9.000	70.5
0.600	27.2	2.200	34.9	5.500	55.1	9.500	72.5
0.800	25.9	2.400	36.4	6.000	57.6		
1.000	25.9	2.600	37.9	6.500	59.9		

Pre-initialised control selected, excessive flows may result.

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Hydro-Brake® Manhole: 3 (D2a), DS/PN: 22.003, Volume (m³): 16.0

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 118.960
 Design Flow (l/s) 63.0 Diameter (mm) 287

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.4	1.200	61.2	3.000	81.5	7.000	124.3
0.200	26.7	1.400	61.5	3.500	87.9	7.500	128.7
0.300	44.6	1.600	62.9	4.000	94.0	8.000	132.9
0.400	58.4	1.800	65.1	4.500	99.7	8.500	137.0
0.500	64.8	2.000	67.7	5.000	105.1	9.000	141.0
0.600	66.4	2.200	70.4	5.500	110.2	9.500	144.8
0.800	65.3	2.400	73.2	6.000	115.1		
1.000	62.6	2.600	76.0	6.500	119.8		

Pre-initialised control selected, excessive flows may result.

Hydro-Brake® Manhole: 6 (D2a), DS/PN: 23.003, Volume (m³): 12.2

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 118.720
 Design Flow (l/s) 63.0 Diameter (mm) 287

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.4	1.200	61.2	3.000	81.5	7.000	124.3
0.200	26.7	1.400	61.5	3.500	87.9	7.500	128.7
0.300	44.6	1.600	62.9	4.000	94.0	8.000	132.9
0.400	58.4	1.800	65.1	4.500	99.7	8.500	137.0
0.500	64.8	2.000	67.7	5.000	105.1	9.000	141.0
0.600	66.4	2.200	70.4	5.500	110.2	9.500	144.8
0.800	65.3	2.400	73.2	6.000	115.1		
1.000	62.6	2.600	76.0	6.500	119.8		


Pre-initialised control selected, excessive flows may result.

Hydro-Brake® Manhole: 83 (D4b), DS/PN: 24.003, Volume (m³): 10.4

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 118.460
 Design Flow (l/s) 30.0 Diameter (mm) 215

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.2	1.200	30.6	3.000	45.7	7.000	69.8
0.200	18.9	1.400	32.0	3.500	49.3	7.500	72.2
0.300	28.4	1.600	33.8	4.000	52.7	8.000	74.6
0.400	31.9	1.800	35.6	4.500	55.9	8.500	76.9
0.500	32.3	2.000	37.4	5.000	59.0	9.000	79.1
0.600	31.7	2.200	39.2	5.500	61.9	9.500	81.3
0.800	30.1	2.400	40.9	6.000	64.6		
1.000	29.7	2.600	42.5	6.500	67.2		

Pre-initialised control selected, excessive flows may result.

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Hydro-Brake® Manhole: 18 (D3a), DS/PN: 21.010, Volume (m³): 25.3

Design Head (m) 2.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 117.665
 Design Flow (l/s) 185.0 Diameter (mm) 446

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	13.7	1.200	197.7	3.000	200.9	7.000	300.3
0.200	42.0	1.400	192.4	3.500	214.1	7.500	310.8
0.300	76.5	1.600	187.5	4.000	227.7	8.000	321.0
0.400	112.2	1.800	184.7	4.500	241.1	8.500	330.9
0.500	144.9	2.000	184.0	5.000	253.9	9.000	340.5
0.600	171.3	2.200	185.3	5.500	266.2	9.500	349.8
0.800	196.4	2.400	187.9	6.000	278.0		
1.000	200.3	2.600	191.6	6.500	289.3		

Pre-initialised control selected, excessive flows may result.


Hydro-Brake Optimum® Manhole: 22 (D6a), DS/PN: 30.002, Volume (m³): 25.3

Unit Reference MD-SHE-0235-3140-1500-3140
 Design Head (m) 1.500
 Design Flow (l/s) 31.4
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Diameter (mm) 235
 Invert Level (m) 120.640
 Minimum Outlet Pipe Diameter (mm) 300
 Suggested Manhole Diameter (mm) 1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	31.3
Flush-Flo™	0.465	31.3
Kick-Flo®	1.020	26.1
Mean Flow over Head Range	-	26.8

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	7.8	1.200	28.2	3.000	43.7	7.000	65.9
0.200	23.7	1.400	30.3	3.500	47.1	7.500	68.2
0.300	30.3	1.600	32.3	4.000	50.3	8.000	70.3
0.400	31.2	1.800	34.2	4.500	53.2	8.500	72.5
0.500	31.3	2.000	36.0	5.000	56.0	9.000	74.5
0.600	31.0	2.200	37.7	5.500	58.6	9.500	76.5
0.800	29.9	2.400	39.3	6.000	61.2		
1.000	26.7	2.600	40.8	6.500	63.6		

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Hydro-Brake Optimum® Manhole: 27 (D6a), DS/PN: 32.002, Volume (m³): 17.5

Unit Reference MD-SHE-0294-5000-1000-5000
Design Head (m) 1.000
Design Flow (l/s) 50.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 294
Invert Level (m) 120.660
Minimum Outlet Pipe Diameter (mm) 375
Suggested Manhole Diameter (mm) 1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	49.9
Flush-Flo™	0.444	49.9
Kick-Flo®	0.783	44.4
Mean Flow over Head Range	-	40.1

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	9.1	1.200	54.5	3.000	85.0	7.000	128.5
0.200	30.3	1.400	58.7	3.500	91.6	7.500	132.9
0.300	48.4	1.600	62.6	4.000	97.7	8.000	137.1
0.400	49.8	1.800	66.3	4.500	103.5	8.500	141.3
0.500	49.8	2.000	69.8	5.000	109.0	9.000	145.3
0.600	48.9	2.200	73.1	5.500	114.2	9.500	149.2
0.800	44.9	2.400	76.2	6.000	119.1		
1.000	49.9	2.600	79.3	6.500	123.9		


Orifice Manhole: Private (D4b), DS/PN: 34.001, Volume (m³): 3.7

Diameter (m) 0.053 Discharge Coefficient 0.600 Invert Level (m) 120.120

Hydro-Brake® Manhole: 39 (D6a), DS/PN: 35.004, Volume (m³): 13.2

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 118.300
Design Flow (l/s) 30.0 Diameter (mm) 215

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.2	1.200	30.6	3.000	45.7	7.000	69.8
0.200	18.9	1.400	32.0	3.500	49.3	7.500	72.2
0.300	28.4	1.600	33.8	4.000	52.7	8.000	74.6
0.400	31.9	1.800	35.6	4.500	55.9	8.500	76.9
0.500	32.3	2.000	37.4	5.000	59.0	9.000	79.1
0.600	31.7	2.200	39.2	5.500	61.9	9.500	81.3
0.800	30.1	2.400	40.9	6.000	64.6		
1.000	29.7	2.600	42.5	6.500	67.2		

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Hydro-Brake® Manhole: 39 (D6a), DS/PN: 35.004, Volume (m³): 13.2

Pre-initialised control selected, excessive flows may result.

Orifice Manhole: Private (D4b), DS/PN: 37.001, Volume (m³): 5.7

Diameter (m) 0.053 Discharge Coefficient 0.600 Invert Level (m) 118.380

Orifice Manhole: 46 (D4a), DS/PN: 38.003, Volume (m³): 4.5

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 118.060

Hydro-Brake Optimum® Manhole: 47 (D3a), DS/PN: 21.013, Volume (m³): 13.2

Unit Reference	MD-SHE-0410-1180-2000-1180
Design Head (m)	2.000
Design Flow (l/s)	118.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Diameter (mm)	410
Invert Level (m)	117.560
Minimum Outlet Pipe Diameter (mm)	450
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)


Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	117.7
Flush-Flo™	0.700	117.4
Kick-Flo®	1.438	100.3
Mean Flow over Head Range	-	98.8

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	11.2	1.200	111.2	3.000	143.4	7.000	217.0
0.200	40.1	1.400	103.0	3.500	154.6	7.500	224.5
0.300	78.0	1.600	105.6	4.000	165.0	8.000	231.7
0.400	111.3	1.800	111.8	4.500	174.8	8.500	238.7
0.500	115.1	2.000	117.7	5.000	184.0	9.000	245.5
0.600	116.9	2.200	123.3	5.500	192.8	9.500	252.1
0.800	117.1	2.400	128.6	6.000	201.2		
1.000	115.0	2.600	133.7	6.500	209.3		

Hydro-Brake® Manhole: 56 (D3a), DS/PN: 21.019, Volume (m³): 10.3

Design Head (m) 1.300 Hydro-Brake® Type Md6 SW Only Invert Level (m) 117.130
Design Flow (l/s) 112.0 Diameter (mm) 362

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Hydro-Brake® Manhole: 56 (D3a), DS/PN: 21.019, Volume (m³): 10.3

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	11.5	1.200	113.0	3.000	130.3	7.000	197.8
0.200	34.2	1.400	110.1	3.500	140.1	7.500	204.8
0.300	60.2	1.600	109.2	4.000	149.6	8.000	211.5
0.400	84.7	1.800	110.1	4.500	158.6	8.500	218.0
0.500	103.7	2.000	112.2	5.000	167.2	9.000	224.3
0.600	114.3	2.200	115.1	5.500	175.3	9.500	230.4
0.800	118.9	2.400	118.6	6.000	183.1		
1.000	116.9	2.600	122.4	6.500	190.6		


Pre-initialised control selected, excessive flows may result.

Hydro-Brake® Manhole: 67 (D3a), DS/PN: 44.004, Volume (m³): 5.4

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 116.615
 Design Flow (l/s) 95.0 Diameter (mm) 334

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	10.7	1.200	91.0	3.000	110.6	7.000	168.4
0.200	31.4	1.400	89.4	3.500	119.2	7.500	174.3
0.300	54.5	1.600	89.6	4.000	127.3	8.000	180.0
0.400	75.1	1.800	91.2	4.500	135.0	8.500	185.6
0.500	89.4	2.000	93.7	5.000	142.3	9.000	190.9
0.600	95.4	2.200	96.8	5.500	149.3	9.500	196.2
0.800	97.0	2.400	100.1	6.000	155.9		
1.000	94.3	2.600	103.6	6.500	162.3		

Pre-initialised control selected, excessive flows may result.

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/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 36
Number of Online Controls 18 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

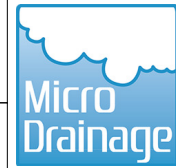
Rainfall Model FEH
Site Location GB 450500 225250 SP 50500 25250
C (1km) -0.023
D1 (1km) 0.328
D2 (1km) 0.309
D3 (1km) 0.264
E (1km) 0.292
F (1km) 2.461
Cv (Summer) 0.750
Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status OFF

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 Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			9
1.001	120 Winter	100	+30%	100/15 Summer	100/15 Summer			12
1.002	15 Winter	100	+30%	100/15 Summer				
1.003	240 Winter	100	+30%	100/15 Summer	100/15 Summer			14
1.004	240 Winter	100	+30%	100/15 Summer				
1.005	360 Winter	100	+30%	100/15 Summer	100/60 Summer			14
2.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			7
2.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
2.002	960 Winter	100	+30%	100/15 Summer	100/15 Summer			18
2.003	480 Winter	100	+30%	100/15 Summer	100/60 Summer			14
1.006	360 Winter	100	+30%	100/15 Summer				
3.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			7
3.001	60 Winter	100	+30%	100/15 Summer	100/15 Summer			14
3.002	30 Winter	100	+30%	100/15 Summer	100/15 Summer			14
3.003	15 Winter	100	+30%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
3.004	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
4.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			8
3.005	240 Winter	100	+30%	100/15 Summer				
5.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
3.006	360 Winter	100	+30%	100/15 Summer				
3.007	480 Winter	100	+30%	100/15 Summer				
3.008	360 Winter	100	+30%	100/15 Summer	100/15 Summer			15
6.000	360 Winter	100	+30%	100/15 Summer				
6.001	360 Winter	100	+30%	100/15 Summer				
1.007	360 Winter	100	+30%	100/15 Summer	100/60 Summer			14
7.000	60 Winter	100	+30%	100/15 Summer	100/15 Summer			8
7.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			8
7.002	60 Winter	100	+30%	100/15 Summer	100/15 Summer			11
7.003	15 Summer	100	+30%	100/15 Summer				
8.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			8
7.004	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
7.005	15 Winter	100	+30%	100/15 Summer				
1.008	15 Winter	100	+30%	100/15 Summer				
1.009	15 Winter	100	+30%	100/15 Summer				
9.000	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
9.001	15 Winter	100	+30%	100/15 Summer				
1.010	15 Winter	100	+30%	100/15 Summer				
10.000	15 Winter	100	+30%	100/15 Summer				
10.001	15 Winter	100	+30%	100/15 Summer				
10.002	15 Winter	100	+30%	100/15 Summer				
10.003	15 Summer	100	+30%	100/15 Summer				
10.004	15 Summer	100	+30%	100/15 Summer				
10.005	120 Winter	100	+30%	100/15 Summer				
10.006	120 Winter	100	+30%	100/15 Summer				
11.000	120 Winter	100	+30%	100/15 Summer				
10.007	120 Winter	100	+30%	100/15 Summer				
10.008	120 Winter	100	+30%	100/15 Summer				
10.009	120 Winter	100	+30%	100/15 Summer				
10.010	120 Winter	100	+30%	100/15 Summer				
10.011	120 Winter	100	+30%	100/15 Summer				
1.011	15 Winter	100	+30%	100/15 Summer				
1.012	15 Winter	100	+30%	100/15 Summer				
12.000	120 Winter	100	+30%	100/15 Summer				
12.001	120 Winter	100	+30%	100/15 Summer				
13.000	60 Winter	100	+30%	100/15 Summer				
13.001	60 Winter	100	+30%	100/15 Summer				
1.013	30 Winter	100	+30%	100/15 Summer	100/15 Summer			5
1.014	30 Winter	100	+30%	100/15 Summer	100/15 Summer			8
1.015	15 Winter	100	+30%	100/15 Summer				
14.000	15 Winter	100	+30%					
14.001	15 Winter	100	+30%	100/15 Summer				
15.000	15 Winter	100	+30%	100/15 Summer				
14.002	15 Winter	100	+30%					
14.003	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
14.004	15 Summer	100	+30%	100/15 Summer	100/15 Summer			2
14.005	15 Summer	100	+30%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
16.000	15 Winter	100	+30%	100/15 Summer				
17.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			7
17.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			7
14.006	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
1.016	15 Winter	100	+30%	100/15 Summer				
1.017	120 Winter	100	+30%	100/15 Summer	100/15 Summer			14
1.018	60 Winter	100	+30%	100/15 Summer	100/15 Summer			13
1.019	240 Winter	100	+30%	100/15 Summer	100/15 Summer			14
1.020	60 Winter	100	+30%	100/15 Summer				
1.021	60 Winter	100	+30%	100/15 Summer				
18.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			6
1.022	60 Winter	100	+30%	100/15 Summer				
1.023	60 Winter	100	+30%	100/15 Summer				
1.024	60 Winter	100	+30%	100/15 Summer				
1.025	60 Winter	100	+30%	100/15 Summer				
19.000	60 Winter	100	+30%	100/15 Summer	100/15 Winter			6
20.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
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				
19.001	30 Winter	100	+30%	100/15 Summer				
19.002	30 Winter	100	+30%	100/15 Summer	100/15 Summer			8
19.003	30 Winter	100	+30%	100/15 Summer				
19.004	60 Winter	100	+30%	100/15 Summer				
1.026	60 Winter	100	+30%	100/15 Summer	100/30 Winter			2
1.027	360 Winter	100	+30%	100/15 Summer				
1.028	360 Winter	100	+30%	100/15 Summer				
1.029	360 Winter	100	+30%	100/15 Summer				
21.000	120 Winter	100	+30%	100/15 Winter				
22.000	15 Winter	100	+30%	100/15 Summer				
22.001	15 Winter	100	+30%	100/15 Summer				
22.002	15 Winter	100	+30%	100/15 Summer				
22.003	15 Winter	100	+30%	100/15 Summer				
21.001	120 Winter	100	+30%	100/15 Summer				
23.000	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
23.001	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
23.002	15 Winter	100	+30%	100/15 Summer				
23.003	15 Winter	100	+30%	100/15 Summer				
21.002	120 Winter	100	+30%	100/15 Summer				
21.003	120 Winter	100	+30%	100/15 Summer				
21.004	120 Winter	100	+30%	100/15 Summer				
24.000	15 Winter	100	+30%	100/15 Winter				
24.001	15 Winter	100	+30%	100/15 Winter				
25.000	15 Winter	100	+30%	100/15 Summer				
24.002	15 Winter	100	+30%	100/15 Summer				
24.003	15 Winter	100	+30%	100/15 Summer				
21.005	120 Winter	100	+30%	100/15 Summer				
21.006	120 Winter	100	+30%	100/15 Summer				
21.007	120 Winter	100	+30%	100/15 Summer				
26.000	120 Winter	100	+30%	100/15 Summer				
26.001	120 Winter	100	+30%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
27.000	120	Winter	100	+30%	100/15	Summer		
26.002	120	Winter	100	+30%	100/15	Summer		
21.008	120	Winter	100	+30%	100/15	Summer		
28.000	120	Winter	100	+30%	100/15	Summer		
21.009	120	Winter	100	+30%	100/15	Summer		
21.010	120	Winter	100	+30%	100/15	Summer		
29.000	15	Winter	100	+30%	100/15	Summer	100/15	Winter 1
29.001	15	Winter	100	+30%	100/15	Summer		
29.002	15	Winter	100	+30%	100/15	Summer		
29.003	15	Winter	100	+30%	100/15	Summer		
30.000	15	Winter	100	+30%	100/15	Winter		
31.000	15	Winter	100	+30%	100/15	Winter		
30.001	15	Winter	100	+30%	100/15	Summer		
30.002	15	Winter	100	+30%	100/15	Summer		
29.004	15	Winter	100	+30%	100/15	Summer		
29.005	15	Winter	100	+30%	100/15	Summer		
32.000	15	Winter	100	+30%	100/15	Summer		
33.000	15	Winter	100	+30%	100/15	Winter		
32.001	15	Winter	100	+30%	100/15	Summer		
32.002	15	Winter	100	+30%	100/15	Summer		
29.006	15	Winter	100	+30%	100/15	Summer		
29.007	15	Winter	100	+30%	100/15	Summer		
29.008	15	Winter	100	+30%	100/15	Summer		
34.000	240	Winter	100	+30%				
34.001	30	Winter	100	+30%	100/15	Summer		
29.009	15	Winter	100	+30%	100/15	Summer		
35.000	15	Winter	100	+30%	100/15	Summer		
35.001	15	Winter	100	+30%	100/15	Summer		
36.000	60	Winter	100	+30%	100/15	Summer		
35.002	30	Winter	100	+30%	100/15	Summer		
35.003	30	Winter	100	+30%	100/15	Summer		
35.004	30	Winter	100	+30%	100/15	Summer		
29.010	15	Winter	100	+30%	100/15	Summer		
37.000	120	Winter	100	+30%	100/15	Summer		
37.001	120	Winter	100	+30%	100/15	Summer		
21.011	15	Winter	100	+30%	100/15	Summer		
21.012	15	Winter	100	+30%	100/15	Summer		
38.000	120	Winter	100	+30%	100/15	Summer		
38.001	120	Winter	100	+30%	100/15	Summer		
38.002	120	Winter	100	+30%	100/15	Summer		
38.003	120	Winter	100	+30%	100/15	Summer		
39.000	15	Winter	100	+30%	100/15	Summer	100/15	Winter 4
21.013	15	Winter	100	+30%	100/15	Summer		
40.000	240	Winter	100	+30%	100/120	Winter		
21.014	240	Winter	100	+30%	100/120	Winter		
41.000	240	Winter	100	+30%	100/120	Winter		
21.015	240	Winter	100	+30%	100/120	Summer		
21.016	240	Winter	100	+30%	100/120	Winter		
21.017	240	Winter	100	+30%	100/120	Summer		
21.018	240	Winter	100	+30%	100/120	Summer		
42.000	240	Winter	100	+30%	100/15	Summer		

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

PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
21.019	240	Winter	100	+30%	100/15	Summer		
21.020	240	Winter	100	+30%	100/15	Summer		
43.000	240	Winter	100	+30%	100/15	Summer		
1.030	240	Winter	100	+30%	100/15	Summer		
1.031	240	Winter	100	+30%	100/15	Summer		
1.032	360	Winter	100	+30%	100/15	Summer	100/240	Winter 2
44.000	15	Winter	100	+30%	100/15	Summer		
44.001	15	Winter	100	+30%	100/15	Summer		
44.002	15	Winter	100	+30%	100/15	Summer		
44.003	15	Winter	100	+30%	100/15	Summer		
45.000	30	Winter	100	+30%	100/15	Summer		
45.001	30	Winter	100	+30%				
46.000	15	Winter	100	+30%	100/15	Summer		
46.001	15	Winter	100	+30%	100/15	Summer		
46.002	15	Winter	100	+30%	100/15	Summer		
45.002	30	Winter	100	+30%	100/15	Winter		
45.003	30	Winter	100	+30%	100/15	Summer		
45.004	30	Winter	100	+30%	100/15	Summer		
45.005	30	Winter	100	+30%				
45.006	15	Winter	100	+30%				
44.004	15	Winter	100	+30%	100/15	Summer		
44.005	60	Winter	100	+30%	100/15	Summer		
1.033	60	Winter	100	+30%	100/15	Summer		
1.034	60	Winter	100	+30%	100/30	Winter		
1.035	60	Winter	100	+30%				

PN	US/MH Name	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	0542	126.686	0.828	107.399	0.95	0.0	58.2	FLOOD
1.001	0648	126.133	0.974	56.912	1.13	0.0	55.6	FLOOD
1.002	Ex MH	126.096	1.224	0.000	1.73	0.0	73.5	FLOOD RISK
1.003	0579	125.676	0.965	35.815	1.13	0.0	59.4	FLOOD
1.004	SC1	125.386	1.277	0.000	0.53	0.0	58.7	FLOOD RISK
1.005	SC2	125.290	1.718	83.612	0.56	0.0	49.0	FLOOD
2.000	0580	125.973	0.504	24.401	0.94	0.0	26.9	FLOOD
2.001	EX MH	125.958	0.800	1.371	1.08	0.0	33.2	FLOOD
2.002	1015	125.259	0.832	177.693	0.79	0.0	12.0	FLOOD
2.003	SC3	125.271	1.146	171.029	0.14	0.0	16.0	FLOOD
1.006	SC4	125.284	1.834	0.000	0.52	0.0	79.2	FLOOD RISK
3.000	0613	126.898	0.746	19.754	1.24	0.0	19.6	FLOOD
3.001	0615	126.569	0.651	59.557	0.90	0.0	16.5	FLOOD
3.002	0610	126.456	1.058	64.742	2.88	0.0	27.3	FLOOD
3.003	0611	126.836	1.456	0.000	1.89	0.0	27.3	FLOOD RISK
3.004	0532	126.435	1.224	7.482	3.35	0.0	41.8	FLOOD
4.000	1032	126.879	1.378	37.165	2.19	0.0	27.0	FLOOD
3.005	0608	125.622	0.280	0.000	0.23	0.0	51.5	SURCHARGED
5.000	GY	125.653	0.403	2.927	2.01	0.0	32.7	FLOOD
3.006	0530	125.508	0.351	0.000	0.25	0.0	54.8	FLOOD RISK
3.007	0544	125.400	0.470	0.000	0.32	0.0	53.1	FLOOD RISK

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

PN	US/MH Name	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m ³)	Flow / Cap. (l/s)	O'flow (l/s)	Pipe Flow (l/s)	Status
3.008	0529	125.306	0.686	72.962	0.37	0.0	59.3	FLOOD
6.000	TANK	125.285	2.045	0.000	0.00	0.0	0.0	FLOOD RISK
6.001	SC5	125.285	1.932	0.000	0.00	0.0	0.0	FLOOD RISK
1.007	SC6	125.285	2.295	121.340	0.95	0.0	13.4	FLOOD
7.000	0842	126.179	0.898	12.629	0.75	0.0	8.3	FLOOD
7.001	0772	126.190	1.362	10.220	1.53	0.0	10.0	FLOOD
7.002	EX MH	125.248	0.838	47.695	1.04	0.0	21.5	FLOOD
7.003	0535	125.732	1.697	0.000	2.26	0.0	22.0	FLOOD RISK
8.000	0533	125.774	1.401	12.477	1.31	0.0	13.6	FLOOD
7.004	0524	125.648	1.658	7.409	1.69	0.0	32.6	FLOOD
7.005	SC19	125.164	1.774	0.000	1.08	0.0	23.9	FLOOD RISK
1.008	SC7	124.734	1.997	0.000	2.50	0.0	33.2	SURCHARGED
1.009	SC8	124.561	1.916	0.000	0.97	0.0	34.2	SURCHARGED
9.000	SC9	125.066	1.896	0.394	0.53	0.0	55.2	FLOOD
9.001	SC10	124.931	2.401	0.000	3.47	0.0	44.6	FLOOD RISK
1.010	SC11	124.515	2.027	0.000	1.66	0.0	65.1	SURCHARGED
10.000	1 (B6)	123.870	0.175	0.000	0.37	0.0	13.4	SURCHARGED
10.001	2 (B6)	123.854	0.259	0.000	0.79	0.0	28.7	SURCHARGED
10.002	3 (B6)	123.835	0.330	0.000	0.81	0.0	30.4	SURCHARGED
10.003	4 (B6)	123.816	0.471	0.000	1.04	0.0	38.3	SURCHARGED
10.004	5 (B6)	123.752	0.547	0.000	1.37	0.0	50.5	SURCHARGED
10.005	6 (B6)	123.738	0.663	0.000	0.75	0.0	26.4	SURCHARGED
10.006	7 (B6)	123.737	0.737	0.000	0.46	0.0	31.8	SURCHARGED
11.000	Tank (B6)	123.736	0.776	0.000	0.27	0.0	16.8	FLOOD RISK
10.007	8 (B6)	123.735	0.825	0.000	0.33	0.0	17.5	FLOOD RISK
10.008	9 (B6)	123.734	0.854	0.000	0.27	0.0	16.6	SURCHARGED
10.009	10 (B6)	123.731	0.911	0.000	0.19	0.0	12.7	SURCHARGED
10.010	11 (B6)	123.727	1.037	0.000	0.14	0.0	9.4	FLOOD RISK
10.011	12 (B6)	123.722	1.292	0.000	0.30	0.0	5.0	FLOOD RISK
1.011	SC12	124.082	1.754	0.000	1.80	0.0	61.1	FLOOD RISK
1.012	SC13	123.833	1.584	0.000	1.14	0.0	70.6	SURCHARGED
12.000	PP (B6)	122.812	0.152	0.000	0.12	0.0	3.1	SURCHARGED
12.001	13 (B6)	122.811	0.331	0.000	0.02	0.0	1.0	SURCHARGED
13.000	PP (B6)	122.016	0.416	0.000	0.49	0.0	5.3	SURCHARGED
13.001	14 (B6)	122.016	0.426	0.000	0.02	0.0	1.0	SURCHARGED
1.013	SC14	122.365	1.229	3.090	1.46	0.0	65.7	FLOOD
1.014	SC15	121.695	0.880	19.954	0.96	0.0	78.4	FLOOD
1.015	SC16	121.639	1.093	0.000	1.14	0.0	77.8	SURCHARGED
14.000	0015	122.918	-0.058	0.000	0.02	0.0	1.3	OK
14.001	0014	122.919	0.038	0.000	0.95	0.0	49.6	SURCHARGED
15.000	0005	122.908	0.069	0.000	1.30	0.0	60.2	SURCHARGED
14.002	0004	122.851	-0.114	0.000	0.35	0.0	121.4	OK
14.003	0454	122.755	0.343	13.125	0.46	0.0	124.6	FLOOD
14.004	0326	122.712	0.680	0.090	1.13	0.0	94.2	FLOOD
14.005	0323	122.599	0.677	0.000	0.93	0.0	111.3	FLOOD RISK
16.000	0455	122.489	0.729	0.000	0.76	0.0	13.1	FLOOD RISK
17.000	0460	122.823	0.477	7.284	1.03	0.0	6.5	FLOOD
17.001	0459	122.214	0.409	19.419	1.46	0.0	28.1	FLOOD
14.006	0373	122.292	0.770	4.754	0.94	0.0	107.0	FLOOD
1.016	0009	121.563	1.096	0.000	2.58	0.0	179.0	SURCHARGED

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1.017	0010	121.052	0.726	126.034	0.83	0.0	125.5	FLOOD
1.018	0011	120.920	0.878	26.818	1.23	0.0	64.0	FLOOD
1.019	0480	119.863	0.531	35.690	1.47	0.0	60.6	FLOOD
1.020	0526	119.269	0.267	0.000	2.92	0.0	61.2	FLOOD RISK
1.021	0643	119.120	0.068	0.000	0.57	0.0	63.4	FLOOD RISK
18.000	0497	119.700	0.726	6.004	2.53	0.0	10.3	FLOOD
1.022	0029	118.969	0.130	0.000	1.00	0.0	95.8	FLOOD RISK
1.023	SC20	118.826	0.204	0.000	0.52	0.0	94.6	SURCHARGED
1.024	SC21	118.577	0.827	0.000	1.40	0.0	91.3	SURCHARGED
1.025	0288	118.401	0.776	0.000	1.48	0.0	90.6	FLOOD RISK
19.000	72 (D4b)	118.811	0.611	10.599	0.30	0.0	17.7	FLOOD
20.000	76 (D4b)	121.632	0.907	1.748	1.27	0.0	67.3	FLOOD
20.001	75 (D4b)	120.269	0.514	0.000	1.38	0.0	66.4	SURCHARGED
20.002	74 (D4b)	119.941	0.386	0.000	0.78	0.0	71.3	SURCHARGED
20.003	73 (D4b)	119.292	0.992	0.000	1.72	0.0	93.5	FLOOD RISK
19.001	71 (D4b)	118.868	0.878	0.000	1.44	0.0	114.5	FLOOD RISK
19.002	70 (D4b)	118.766	0.936	6.582	0.38	0.0	27.6	FLOOD
19.003	77 (D4b)	118.434	0.894	0.000	0.90	0.0	27.9	FLOOD RISK
19.004	78 (D4b)	118.356	0.751	0.000	0.49	0.0	28.7	FLOOD RISK
1.026	SC17	118.281	0.731	1.369	1.59	0.0	102.1	FLOOD
1.027	SC18	118.127	0.677	0.000	1.30	0.0	85.5	FLOOD RISK
1.028	SC18a	117.990	0.640	0.000	1.41	0.0	85.5	SURCHARGED
1.029	SC18b	117.894	0.594	0.000	1.21	0.0	85.5	SURCHARGED
21.000	1 (D2a)	119.623	0.223	0.000	0.27	0.0	17.9	SURCHARGED
22.000	2 (D2a)	120.074	0.404	0.000	1.24	0.0	76.3	SURCHARGED
22.001	2a (D2a)	119.978	0.358	0.000	2.45	0.0	155.7	SURCHARGED
22.002	2b (D2a)	119.796	0.246	0.000	0.21	0.0	78.9	SURCHARGED
22.003	3 (D2a)	119.809	0.549	0.000	0.91	0.0	51.3	SURCHARGED
21.001	4 (D2a)	119.618	0.408	0.000	0.41	0.0	74.1	SURCHARGED
23.000	5 (D2a)	120.525	1.110	5.491	1.98	0.0	70.5	FLOOD
23.001	5a (D2a)	120.585	1.260	0.630	2.36	0.0	144.8	FLOOD
23.002	5b (D2a)	120.592	1.317	0.000	0.89	0.0	229.9	FLOOD RISK
23.003	6 (D2a)	120.505	1.485	0.000	0.97	0.0	66.3	FLOOD RISK
21.002	7 (D2a)	119.612	0.672	0.000	0.67	0.0	107.5	SURCHARGED
21.003	8 (D2a)	119.603	0.753	0.000	0.76	0.0	114.4	SURCHARGED
21.004	9 (D2a)	119.595	0.805	0.000	0.95	0.0	113.0	SURCHARGED
24.000	80 (D4b)	120.641	0.541	0.000	0.38	0.0	49.4	SURCHARGED
24.001	81 (D4b)	120.633	0.833	0.000	0.66	0.0	91.9	SURCHARGED
25.000	Tank (D4b)	120.614	1.454	0.000	0.22	0.0	26.8	SURCHARGED
24.002	82 (D4b)	120.612	1.502	0.000	0.20	0.0	58.5	FLOOD RISK
24.003	83 (D4b)	120.607	1.772	0.000	0.32	0.0	34.6	FLOOD RISK
21.005	84 (D4b)	119.592	0.817	0.000	0.86	0.0	140.7	SURCHARGED
21.006	12 (D2a)	119.545	0.865	0.000	0.80	0.0	133.8	SURCHARGED
21.007	13 (D2a)	119.536	0.931	0.000	0.71	0.0	139.3	SURCHARGED
26.000	14a (D2a)	119.537	0.777	0.000	0.45	0.0	16.3	FLOOD RISK
26.001	14 (D2a)	119.533	0.873	0.000	0.09	0.0	22.1	SURCHARGED
27.000	15 (D3a)	119.532	0.872	0.000	0.04	0.0	11.2	SURCHARGED
26.002	16 (D2a)	119.532	0.932	0.000	0.08	0.0	22.4	FLOOD RISK
21.008	17 (D2a)	119.531	0.961	0.000	0.27	0.0	115.6	SURCHARGED
28.000	85 (D4b)	119.526	1.046	0.000	0.17	0.0	27.3	SURCHARGED

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21.009	17a (D3a)	119.525	1.059	0.000	0.24	0.0	91.3	SURCHARGED
21.010	18 (D3a)	119.520	1.105	0.000	0.32	0.0	85.2	SURCHARGED
29.000	Spur (VC)	123.450	1.475	0.066	1.06	0.0	48.5	FLOOD
29.001	19 (VC)	123.353	1.483	0.000	1.15	0.0	82.7	FLOOD RISK
29.002	20 (D6a)	123.091	1.431	0.000	1.33	0.0	90.8	SURCHARGED
29.003	23a (D6a)	122.831	1.331	0.000	0.72	0.0	135.9	SURCHARGED
30.000	21 (D6a)	121.817	0.267	0.000	0.18	0.0	92.9	SURCHARGED
31.000	21a (D6a)	121.816	0.306	0.000	0.08	0.0	27.9	SURCHARGED
30.001	21b (D6a)	121.814	0.344	0.000	0.10	0.0	44.3	SURCHARGED
30.002	22 (D6a)	121.809	0.869	0.000	0.38	0.0	31.2	SURCHARGED
29.004	23 (D6a)	122.480	1.650	0.000	1.88	0.0	122.2	SURCHARGED
29.005	24 (D6a)	122.177	1.437	0.000	2.09	0.0	139.0	SURCHARGED
32.000	25 (D6a)	121.523	0.123	0.000	0.47	0.0	66.5	SURCHARGED
33.000	26a (D6a)	121.571	0.121	0.000	0.04	0.0	8.2	SURCHARGED
32.001	26 (D6a)	121.569	0.229	0.000	0.31	0.0	78.0	SURCHARGED
32.002	27 (D6a)	121.636	0.676	0.000	0.34	0.0	49.7	SURCHARGED
29.006	28 (D6a)	121.681	1.071	0.000	1.15	0.0	180.3	SURCHARGED
29.007	29 (D6a)	121.094	0.954	0.000	1.13	0.0	249.4	SURCHARGED
29.008	32 (D6a)	120.347	0.767	0.000	1.30	0.0	319.8	SURCHARGED
34.000	Tank (D4b)	120.450	0.000	0.000	0.09	0.0	5.7	SURCHARGED*
34.001	Private (D4b)	121.283	1.013	0.000	0.14	0.0	6.2	FLOOD RISK
29.009	33 (D6a)	120.140	0.750	0.000	0.98	0.0	352.9	SURCHARGED
35.000	34 (D6a)	120.240	0.740	0.000	1.11	0.0	97.2	SURCHARGED
35.001	35 (D6a)	119.785	0.645	0.000	2.19	0.0	134.6	SURCHARGED
36.000	36 (D6a)	119.504	0.334	0.000	0.21	0.0	23.6	SURCHARGED
35.002	37 (D6a)	119.526	0.436	0.000	0.17	0.0	59.3	SURCHARGED
35.003	38 (D6a)	119.530	0.540	0.000	0.17	0.0	56.4	SURCHARGED
35.004	39 (D6a)	119.528	0.928	0.000	0.33	0.0	32.1	SURCHARGED
29.010	40 (D6a)	119.567	1.117	0.000	1.46	0.0	379.2	SURCHARGED
37.000	Private (D4b)	119.258	0.383	0.000	0.03	0.0	3.7	SURCHARGED
37.001	Private (D4b)	119.258	0.578	0.000	0.03	0.0	3.9	SURCHARGED
21.011	43 (D3a)	119.475	1.090	0.000	0.67	0.0	223.1	SURCHARGED
21.012	44 (D3a)	119.456	1.111	0.000	0.49	0.0	212.9	SURCHARGED
38.000	45 (D4a)	119.311	0.711	0.000	0.12	0.0	7.9	FLOOD RISK
38.001	45a (D4a)	119.311	0.801	0.000	0.14	0.0	9.3	FLOOD RISK
38.002	45b (D4a)	119.310	0.885	0.000	0.16	0.0	9.7	FLOOD RISK
38.003	46 (D4a)	119.308	0.948	0.000	0.18	0.0	9.9	SURCHARGED
39.000	47a (D3a)	119.325	0.795	6.194	0.33	0.0	39.8	FLOOD
21.013	47 (D3a)	119.445	1.135	0.000	0.27	0.0	117.3	SURCHARGED
40.000	49 (D3a)	118.640	0.310	0.000	0.02	0.0	16.8	SURCHARGED
21.014	50 (D3a)	118.640	0.395	0.000	0.13	0.0	121.3	SURCHARGED
41.000	51 (D3a)	118.632	0.452	0.000	0.02	0.0	10.1	SURCHARGED
21.015	52 (D3a)	118.632	0.482	0.000	0.34	0.0	129.0	SURCHARGED
21.016	53 (D3a)	118.623	0.503	0.000	0.28	0.0	128.3	SURCHARGED
21.017	53a (D3a)	118.616	0.526	0.000	0.31	0.0	131.8	SURCHARGED
21.018	54 (D3a)	118.608	0.548	0.000	0.22	0.0	133.1	FLOOD RISK
42.000	55 (D3a)	118.604	0.974	0.000	0.12	0.0	17.9	FLOOD RISK
21.019	56 (D3a)	118.603	1.098	0.000	0.97	0.0	115.5	FLOOD RISK
21.020	57 (D3a)	117.905	0.495	0.000	0.81	0.0	116.7	FLOOD RISK
43.000	58 (D3a)	117.782	0.432	0.000	0.31	0.0	4.5	SURCHARGED

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1.030	SC18c	117.779	0.506	0.000	1.73	0.0	192.9	FLOOD RISK
1.031	0271	117.536	0.344	0.000	1.07	0.0	192.9	FLOOD RISK
1.032	0270	117.262	0.309	3.934	1.49	0.0	192.1	FLOOD
44.000	59 (D3a)	119.162	1.722	0.000	0.95	0.0	75.0	SURCHARGED
44.001	60 (D3a)	118.983	1.743	0.000	1.93	0.0	129.0	FLOOD RISK
44.002	61 (D3a)	118.380	1.300	0.000	2.33	0.0	148.6	SURCHARGED
44.003	62 (D3a)	118.127	1.157	0.000	3.14	0.0	185.1	SURCHARGED
45.000	69 (D3a)	119.398	0.173	0.000	0.10	0.0	4.4	SURCHARGED
45.001	Swale (D3a)	119.396	-0.004	0.000	0.01	0.0	17.3	FLOOD RISK
46.000	63 (D3a)	119.622	0.217	0.000	0.73	0.0	73.2	SURCHARGED
46.001	64 (D3a)	119.537	0.242	0.000	1.32	0.0	110.5	SURCHARGED
46.002	65 (D3a)	119.452	0.187	0.000	2.48	0.0	185.5	SURCHARGED
45.002	Swale (D3a)	119.397	0.047	0.000	0.06	0.0	87.5	FLOOD RISK
45.003	Pipe (D3a)	119.326	0.406	0.000	1.58	0.0	24.2	FLOOD RISK
45.004	66 (D3a)	118.877	0.137	0.000	1.61	0.0	24.2	SURCHARGED
45.005	Swale (D3a)	118.556	-0.444	0.000	0.01	0.0	24.2	OK
45.006	Pipe (D3a)	118.010	-0.040	0.000	0.57	0.0	36.3	OK
44.004	67 (D3a)	117.982	0.992	0.000	0.89	0.0	96.8	SURCHARGED
44.005	68 (D3a)	117.156	0.286	0.000	1.04	0.0	91.2	SURCHARGED
1.033	EX MH A	117.080	0.235	0.000	1.61	0.0	231.5	FLOOD RISK
1.034	EX MH	116.730	0.020	0.000	1.12	0.0	231.4	SURCHARGED
1.035	PI	116.342	-0.118	0.000	0.90	0.0	231.4	OK