

Hydrock Consultants Ltd		Page 1
.	Land off Misery Lane	
.	SW Calculations	
.		
Date 19/12/2024	Designed by JAC	
File 21627-HYD-XX-XX-CA-C-0001_R4.MDX	Checked by -	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	19.400	Add Flow / Climate Change (%)	40
Ratio R	0.350	Minimum Backdrop Height (m)	0.010
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	2.928	1.150	2.5	0.005	5.00	0.0	0.600	o	100	Pipe/Conduit	
2.000	11.269	0.141	80.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	10.001	0.960	10.4	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	15.991	0.700	22.8	0.024	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.000	10.432	0.130	80.2	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	7.780	0.800	9.7	0.009	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.000	6.397	1.150	5.6	0.005	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	18.090	0.710	25.5	0.013	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	9.696	0.190	51.0	0.004	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	37.766	0.500	75.5	0.052	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.01	43.600	0.005	0.0	0.0	0.3	4.88	38.4	0.9
2.000	50.00	5.17	43.551	0.000	0.0	0.0	0.0	1.12	19.9	0.0
2.001	50.00	5.22	43.410	0.020	0.0	0.0	1.1	3.14	55.5	3.8
1.001	50.00	5.32	42.375	0.049	0.0	0.0	2.7	2.75	109.3	9.3
3.000	50.00	5.15	42.680	0.000	0.0	0.0	0.0	1.12	19.8	0.0
3.001	50.00	5.19	42.550	0.009	0.0	0.0	0.5	3.25	57.4	1.7
4.000	50.00	5.02	42.900	0.005	0.0	0.0	0.3	4.30	76.0	0.9
1.002	50.00	5.43	41.675	0.076	0.0	0.0	4.1	2.60	103.5	14.4
1.003	50.00	5.52	40.965	0.080	0.0	0.0	4.3	1.84	73.0	15.2
1.004	50.00	5.87	40.700	0.132	0.0	0.0	7.1	1.81	128.0	25.0

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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)	Section Type	Auto Design
1.005	33.381	0.111	300.7	0.071	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.006	43.282	0.144	300.6	0.074	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.007	15.283	0.051	300.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.000	4.819	0.060	80.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	9.506	2.396	4.0	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.008	30.977	0.607	51.0	0.044	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.009	31.711	1.600	19.8	0.052	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.010	35.333	1.770	20.0	0.080	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.011	9.983	0.459	21.7	0.030	0.00	0.0	0.600	o	375	Pipe/Conduit	
6.000	9.204	0.089	103.2	0.013	5.00	0.0	0.600	o	150	Pipe/Conduit	
6.001	10.198	0.700	14.6	0.010	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.002	10.626	1.300	8.2	0.025	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.012	7.690	0.321	24.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.013	41.040	1.434	28.6	0.008	0.00	0.0	0.600	o	375	Pipe/Conduit	
7.000	9.593	0.120	79.9	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
7.001	15.770	0.700	22.5	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit	
7.002	15.406	0.350	44.0	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
7.003	5.506	1.000	5.5	0.005	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.014	18.975	1.503	12.6	0.033	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.005	50.00	6.40	40.125	0.203	0.0	0.0	11.0	1.04	114.8	38.5
1.006	50.00	7.10	40.014	0.277	0.0	0.0	15.0	1.04	114.8	52.5
1.007	50.00	7.34	39.870	0.277	0.0	0.0	15.0	1.04	114.8	52.5
5.000	50.00	5.07	42.500	0.000	0.0	0.0	0.0	1.12	19.9	0.0
5.001	50.00	5.10	42.440	0.013	0.0	0.0	0.7	5.10	90.1	2.5
1.008	50.00	7.55	39.819	0.334	0.0	0.0	18.1	2.54	280.7	63.3
1.009	50.00	7.67	39.212	0.386	0.0	0.0	20.9	4.09	451.3	73.2
1.010	50.00	7.82	37.612	0.466	0.0	0.0	25.2	4.07	449.7	88.3
1.011	50.00	7.86	35.842	0.496	0.0	0.0	26.9	3.90	430.7	94.0
6.000	50.00	5.16	37.739	0.013	0.0	0.0	0.7	0.99	17.5	2.5
6.001	50.00	5.22	37.650	0.023	0.0	0.0	1.2	2.65	46.9	4.4
6.002	50.00	5.27	36.950	0.048	0.0	0.0	2.6	3.55	62.7	9.1
1.012	50.00	7.90	35.383	0.544	0.0	0.0	29.5	3.72	410.4	103.1
1.013	50.00	8.10	35.062	0.552	0.0	0.0	29.9	3.40	375.3	104.6
7.000	50.00	5.14	36.020	0.000	0.0	0.0	0.0	1.13	19.9	0.0
7.001	50.00	5.27	35.900	0.007	0.0	0.0	0.4	2.13	37.7	1.3
7.002	50.00	5.43	35.200	0.020	0.0	0.0	1.1	1.52	26.9	3.8
7.003	50.00	5.46	34.850	0.025	0.0	0.0	1.4	4.32	76.4	4.7
1.014	50.00	8.16	33.628	0.610	0.0	0.0	33.0	5.12	565.8	115.6

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
8.000	4.399	0.055	80.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
8.001	5.830	0.790	7.4	0.034	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.002	15.360	0.102	150.0	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.000	5.224	0.066	79.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
9.001	5.856	1.452	4.0	0.034	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.003	24.203	0.161	150.0	0.065	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.000	5.095	0.057	88.8	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
10.001	7.052	2.013	3.5	0.011	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.004	20.119	0.134	150.0	0.031	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.000	4.371	0.060	72.8	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
11.001	5.523	1.066	5.2	0.012	0.00	0.0	0.600	o	150	Pipe/Conduit	
11.002	12.192	0.691	17.6	0.024	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.003	9.333	0.629	14.8	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
12.000	4.794	0.060	80.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
12.001	4.037	0.806	5.0	0.015	0.00	0.0	0.600	o	150	Pipe/Conduit	
11.004	32.691	2.175	15.0	0.053	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.005	12.470	0.823	15.2	0.033	0.00	0.0	0.600	o	300	Pipe/Conduit	
11.006	8.617	0.566	15.2	0.035	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
8.000	50.00	5.07	36.495	0.000	0.0	0.0	0.0	1.12	19.9	0.0
8.001	50.00	5.09	36.440	0.034	0.0	0.0	1.8	3.73	66.0	6.4
8.002	50.00	5.33	35.575	0.068	0.0	0.0	3.7	1.07	42.4	12.9
9.000	50.00	5.08	37.066	0.000	0.0	0.0	0.0	1.13	20.0	0.0
9.001	50.00	5.10	37.000	0.034	0.0	0.0	1.8	5.05	89.3	6.4
8.003	50.00	5.71	35.473	0.167	0.0	0.0	9.0	1.07	42.4	31.7
10.000	50.00	5.08	37.457	0.000	0.0	0.0	0.0	1.07	18.9	0.0
10.001	50.00	5.10	37.400	0.011	0.0	0.0	0.6	5.42	95.8	2.1
8.004	50.00	6.02	35.312	0.209	0.0	0.0	11.3	1.07	42.4	39.6
11.000	50.00	5.06	44.350	0.000	0.0	0.0	0.0	1.18	20.8	0.0
11.001	50.00	5.08	44.290	0.012	0.0	0.0	0.6	4.46	78.8	2.3
11.002	50.00	5.15	43.149	0.036	0.0	0.0	1.9	3.13	124.5	6.8
11.003	50.00	5.19	42.458	0.046	0.0	0.0	2.5	3.41	135.8	8.7
12.000	50.00	5.07	42.770	0.000	0.0	0.0	0.0	1.12	19.9	0.0
12.001	50.00	5.09	42.710	0.015	0.0	0.0	0.8	4.53	80.1	2.8
11.004	50.00	5.35	41.829	0.114	0.0	0.0	6.2	3.39	134.9	21.6
11.005	50.00	5.40	39.579	0.147	0.0	0.0	8.0	4.06	286.9	27.9
11.006	50.00	5.44	38.756	0.182	0.0	0.0	9.9	4.05	286.3	34.5

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
13.000	12.379	0.155	80.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
13.001	5.461	0.980	5.6	0.053	0.00	0.0	0.600	o	150	Pipe/Conduit	
11.007	29.886	1.503	19.9	0.086	0.00	0.0	0.600	o	300	Pipe/Conduit	
11.008	11.607	1.597	7.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
8.005	24.324	0.065	375.0	0.042	0.00	0.0	0.600	o	450	Pipe/Conduit	
8.006	7.892	0.021	375.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
14.000	4.776	0.050	95.5	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
14.001	13.089	2.033	6.4	0.014	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.007	15.625	0.042	375.0	0.028	0.00	0.0	0.600	o	450	Pipe/Conduit	
15.000	4.749	0.050	95.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
15.001	8.524	2.075	4.1	0.012	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.008	16.374	0.044	375.0	0.011	0.00	0.0	0.600	o	450	Pipe/Conduit	
8.009	7.803	0.393	19.9	0.010	0.00	0.0	0.600	o	450	Pipe/Conduit	
8.010	14.682	0.039	375.0	0.010	0.00	0.0	0.600	o	450	Pipe/Conduit	
8.011	28.813	0.077	375.0	0.051	0.00	0.0	0.600	o	450	Pipe/Conduit	
8.012	24.268	0.472	51.4	0.061	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.000	5.581	0.100	55.8	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
16.001	6.051	1.150	5.3	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
13.000	50.00	5.18	39.475	0.000	0.0	0.0	0.0	1.12	19.9	0.0
13.001	50.00	5.20	39.320	0.053	0.0	0.0	2.9	4.30	75.9	10.0
11.007	50.00	5.58	38.190	0.321	0.0	0.0	17.4	3.54	250.4	60.9
11.008	50.00	5.61	36.625	0.321	0.0	0.0	17.4	6.76	746.2	60.9
8.005	50.00	6.41	34.953	0.572	0.0	0.0	31.0	1.04	166.0	108.4
8.006	50.00	6.54	34.888	0.572	0.0	0.0	31.0	1.04	166.0	108.4
14.000	50.00	5.08	37.250	0.000	0.0	0.0	0.0	1.03	18.2	0.0
14.001	50.00	5.13	37.200	0.014	0.0	0.0	0.8	4.00	70.6	2.7
8.007	50.00	6.79	34.867	0.614	0.0	0.0	33.3	1.04	166.0	116.4
15.000	50.00	5.08	37.250	0.000	0.0	0.0	0.0	1.03	18.2	0.0
15.001	50.00	5.11	37.200	0.012	0.0	0.0	0.6	5.01	88.5	2.3
8.008	50.00	7.05	34.825	0.637	0.0	0.0	34.5	1.04	166.0	120.8
8.009	50.00	7.08	34.781	0.647	0.0	0.0	35.0	4.58	728.2	122.7
8.010	50.00	7.31	34.388	0.657	0.0	0.0	35.6	1.04	166.0	124.6
8.011	50.00	7.77	34.349	0.708	0.0	0.0	38.3	1.04	166.0	134.2
8.012	50.00	7.92	34.272	0.769	0.0	0.0	41.7	2.84	451.8	145.8
16.000	50.00	5.07	35.350	0.000	0.0	0.0	0.0	1.35	23.8	0.0
16.001	50.00	5.09	35.250	0.018	0.0	0.0	1.0	4.42	78.2	3.4

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PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
8.013	8.506	0.178	47.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
17.000	4.861	0.100	48.6	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
17.001	3.310	0.978	3.4	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.014	21.686	1.572	13.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.015	14.663	4.150	3.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.016	4.584	0.050	91.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.017	21.161	0.000	0.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.018	6.804	0.050	136.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.019	32.136	5.378	6.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.020	18.413	0.110	167.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.021	35.377	0.212	166.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.022	9.960	0.100	99.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
8.013	50.00	7.96	33.800	0.787	0.0	0.0	42.6	2.95	468.7	149.2
17.000	50.00	5.06	35.000	0.000	0.0	0.0	0.0	1.45	25.6	0.0
17.001	50.00	5.07	34.900	0.013	0.0	0.0	0.7	5.52	97.5	2.5
8.014	50.00	8.03	33.622	0.800	0.0	0.0	43.3	5.50	874.1	151.7
1.015	50.00	8.18	32.050	1.410	0.0	0.0	76.4	10.87	1729.2	267.3
1.016	50.00	8.21	27.750	1.410	0.0	0.0	76.4	2.54	719.4	267.3
1.017	50.00	9.71	27.350	1.410	0.0	0.0	76.4	0.23	66.4<	267.3
1.018	50.00	9.77	27.350	1.410	0.0	0.0	76.4	2.09	589.8	267.3
1.019	50.00	9.87	27.300	1.410	0.0	0.0	76.4	5.39	214.2<	267.3
1.020	50.00	10.17	21.922	1.410	0.0	0.0	76.4	1.01	40.1<	267.3
1.021	50.00	10.76	21.812	1.410	0.0	0.0	76.4	1.01	40.1<	267.3
1.022	50.00	10.92	21.600	1.410	0.0	0.0	76.4	1.01	17.8<	267.3

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)
1.022	52 HW	21.750	21.500	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet 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 Online Controls	20	Number of Time/Area Diagrams	0
		Number of Storage Structures	23
		Number of Real Time Controls	0

Synthetic Rainfall Details

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Simulation Criteria for Storm

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.400	Storm Duration (mins)	30
Ratio R	0.350		

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<u>Online Controls for Storm</u> <u>Orifice Manhole: 13b, DS/PN: 2.001, Volume (m³): 0.9</u> Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 43.410 <u>Orifice Manhole: 14b, DS/PN: 3.001, Volume (m³): 0.8</u> Diameter (m) 0.026 Discharge Coefficient 0.600 Invert Level (m) 42.550 <u>Orifice Manhole: 30a, DS/PN: 5.001, Volume (m³): 0.9</u> Diameter (m) 0.026 Discharge Coefficient 0.600 Invert Level (m) 42.440 <u>Orifice Manhole: 34b, DS/PN: 6.001, Volume (m³): 0.8</u> Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 37.650 <u>Orifice Manhole: 34a, DS/PN: 6.002, Volume (m³): 0.8</u> Diameter (m) 0.056 Discharge Coefficient 0.600 Invert Level (m) 36.950 <u>Orifice Manhole: 36c, DS/PN: 7.001, Volume (m³): 0.8</u> Diameter (m) 0.026 Discharge Coefficient 0.600 Invert Level (m) 35.900 <u>Orifice Manhole: 36b, DS/PN: 7.002, Volume (m³): 0.9</u> Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 35.200 <u>Orifice Manhole: 36a, DS/PN: 7.003, Volume (m³): 0.9</u> Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 34.850 <u>Orifice Manhole: 11a, DS/PN: 8.001, Volume (m³): 1.1</u> Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 36.440 <u>Orifice Manhole: 10a, DS/PN: 9.001, Volume (m³): 0.9</u> Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 37.000 <u>Orifice Manhole: 9a, DS/PN: 10.001, Volume (m³): 1.0</u> Diameter (m) 0.026 Discharge Coefficient 0.600 Invert Level (m) 37.400 <u>Orifice Manhole: 1a, DS/PN: 11.001, Volume (m³): 0.8</u> Diameter (m) 0.026 Discharge Coefficient 0.600 Invert Level (m) 44.290 <u>Orifice Manhole: 3a, DS/PN: 12.001, Volume (m³): 1.1</u> Diameter (m) 0.026 Discharge Coefficient 0.600 Invert Level (m) 42.710		
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<u>Orifice Manhole: 6a, DS/PN: 13.001, Volume (m³): 1.5</u> Diameter (m) 0.026 Discharge Coefficient 0.600 Invert Level (m) 39.320 <u>Orifice Manhole: 23a, DS/PN: 14.001, Volume (m³): 1.3</u> Diameter (m) 0.026 Discharge Coefficient 0.600 Invert Level (m) 37.200 <u>Orifice Manhole: 37a, DS/PN: 15.001, Volume (m³): 0.9</u> Diameter (m) 0.026 Discharge Coefficient 0.600 Invert Level (m) 37.200 <u>Orifice Manhole: 41a, DS/PN: 16.001, Volume (m³): 0.8</u> Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 35.250 <u>Orifice Manhole: 42a, DS/PN: 17.001, Volume (m³): 0.8</u> Diameter (m) 0.026 Discharge Coefficient 0.600 Invert Level (m) 34.900 <u>Hydro-Brake® Optimum Manhole: 47 FC, DS/PN: 1.019, Volume (m³): 8.6</u> <table><tr><td>Unit Reference</td><td>MD-SHE-0148-1200-1700-1200</td></tr><tr><td>Design Head (m)</td><td>1.700</td></tr><tr><td>Design Flow (l/s)</td><td>12.0</td></tr><tr><td>Flush-Flo™</td><td>Calculated</td></tr><tr><td>Objective</td><td>Minimise upstream storage</td></tr><tr><td>Application</td><td>Surface</td></tr><tr><td>Sump Available</td><td>Yes</td></tr><tr><td>Diameter (mm)</td><td>148</td></tr><tr><td>Invert Level (m)</td><td>27.300</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td>225</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td>1500</td></tr></table> <table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>1.700</td><td>12.0</td><td>Kick-Flo®</td><td>1.042</td><td>9.5</td></tr><tr><td>Flush-Flo™</td><td>0.493</td><td>12.0</td><td>Mean Flow over Head Range</td><td>-</td><td>10.5</td></tr></table> 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 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>5.3</td><td>0.800</td><td>11.4</td><td>2.000</td><td>13.0</td><td>4.000</td><td>18.0</td><td>7.000</td><td>23.6</td></tr><tr><td>0.200</td><td>10.5</td><td>1.000</td><td>10.0</td><td>2.200</td><td>13.6</td><td>4.500</td><td>19.1</td><td>7.500</td><td>24.4</td></tr><tr><td>0.300</td><td>11.5</td><td>1.200</td><td>10.2</td><td>2.400</td><td>14.1</td><td>5.000</td><td>20.0</td><td>8.000</td><td>25.1</td></tr><tr><td>0.400</td><td>11.9</td><td>1.400</td><td>10.9</td><td>2.600</td><td>14.7</td><td>5.500</td><td>21.0</td><td>8.500</td><td>25.9</td></tr><tr><td>0.500</td><td>12.0</td><td>1.600</td><td>11.7</td><td>3.000</td><td>15.7</td><td>6.000</td><td>21.9</td><td>9.000</td><td>26.6</td></tr><tr><td>0.600</td><td>11.9</td><td>1.800</td><td>12.3</td><td>3.500</td><td>16.9</td><td>6.500</td><td>22.7</td><td>9.500</td><td>27.3</td></tr></table> <u>Hydro-Brake® Optimum Manhole: 51 FC, DS/PN: 1.022, Volume (m³): 5.5</u> <table><tr><td>Unit Reference</td><td>MD-SHE-0145-1030-1200-1030</td></tr><tr><td>Design Head (m)</td><td>1.200</td></tr><tr><td>Design Flow (l/s)</td><td>10.3</td></tr><tr><td>Flush-Flo™</td><td>Calculated</td></tr><tr><td>Objective</td><td>Minimise upstream storage</td></tr><tr><td>Application</td><td>Surface</td></tr><tr><td>Sump Available</td><td>Yes</td></tr></table>			Unit Reference	MD-SHE-0148-1200-1700-1200	Design Head (m)	1.700	Design Flow (l/s)	12.0	Flush-Flo™	Calculated	Objective	Minimise upstream storage	Application	Surface	Sump Available	Yes	Diameter (mm)	148	Invert Level (m)	27.300	Minimum Outlet Pipe Diameter (mm)	225	Suggested Manhole Diameter (mm)	1500	Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.700	12.0	Kick-Flo®	1.042	9.5	Flush-Flo™	0.493	12.0	Mean Flow over Head Range	-	10.5	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	5.3	0.800	11.4	2.000	13.0	4.000	18.0	7.000	23.6	0.200	10.5	1.000	10.0	2.200	13.6	4.500	19.1	7.500	24.4	0.300	11.5	1.200	10.2	2.400	14.1	5.000	20.0	8.000	25.1	0.400	11.9	1.400	10.9	2.600	14.7	5.500	21.0	8.500	25.9	0.500	12.0	1.600	11.7	3.000	15.7	6.000	21.9	9.000	26.6	0.600	11.9	1.800	12.3	3.500	16.9	6.500	22.7	9.500	27.3	Unit Reference	MD-SHE-0145-1030-1200-1030	Design Head (m)	1.200	Design Flow (l/s)	10.3	Flush-Flo™	Calculated	Objective	Minimise upstream storage	Application	Surface	Sump Available	Yes
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Hydro-Brake® Optimum Manhole: 51 FC, DS/PN: 1.022, Volume (m³): 5.5

Diameter (mm) 145
Invert Level (m) 21.600
Minimum Outlet Pipe Diameter (mm) 225
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	10.3	Kick-Flo®	0.783	8.4
Flush-Flo™	0.359	10.3	Mean Flow over Head Range	-	8.9

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)	Depth (m)	Flow (l/s)
0.100	5.2	0.800	8.5	2.000	13.1	4.000	18.2	7.000	23.8
0.200	9.7	1.000	9.5	2.200	13.7	4.500	19.3	7.500	24.7
0.300	10.2	1.200	10.3	2.400	14.3	5.000	20.3	8.000	25.4
0.400	10.3	1.400	11.1	2.600	14.8	5.500	21.2	8.500	26.2
0.500	10.1	1.600	11.8	3.000	15.9	6.000	22.1	9.000	26.9
0.600	9.8	1.800	12.5	3.500	17.1	6.500	23.0	9.500	27.6

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Storage Structures for Storm

Porous Car Park Manhole: 13a, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	9.6
Max Percolation (l/s)	12.8	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	43.600	Membrane Depth (mm)	130

Porous Car Park Manhole: 13b, DS/PN: 2.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	9.6
Max Percolation (l/s)	12.8	Slope (1:X)	30.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	43.410	Membrane Depth (mm)	130

Porous Car Park Manhole: 14b, DS/PN: 3.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	9.6
Max Percolation (l/s)	12.8	Slope (1:X)	30.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	42.550	Membrane Depth (mm)	130

Porous Car Park Manhole: 14a, DS/PN: 4.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	9.6
Max Percolation (l/s)	12.8	Slope (1:X)	30.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	42.900	Membrane Depth (mm)	130

Porous Car Park Manhole: 30a, DS/PN: 5.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.4
Membrane Percolation (mm/hr)	1000	Length (m)	4.8
Max Percolation (l/s)	7.2	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	42.440	Membrane Depth (mm)	130

Porous Car Park Manhole: 34b, DS/PN: 6.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.8
Max Percolation (l/s)	10.7	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	37.650	Membrane Depth (mm)	130

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<u>Porous Car Park Manhole: 34a, DS/PN: 6.002</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 8.0 Membrane Percolation (mm/hr) 1000 Length (m) 5.0 Max Percolation (l/s) 11.1 Slope (1:X) 100.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 36.950 Membrane Depth (mm) 130 <u>Porous Car Park Manhole: 36c, DS/PN: 7.001</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 4.8 Membrane Percolation (mm/hr) 1000 Length (m) 9.6 Max Percolation (l/s) 12.8 Slope (1:X) 30.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 35.900 Membrane Depth (mm) 130 <u>Porous Car Park Manhole: 36b, DS/PN: 7.002</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 4.8 Membrane Percolation (mm/hr) 1000 Length (m) 9.6 Max Percolation (l/s) 12.8 Slope (1:X) 30.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 35.200 Membrane Depth (mm) 130 <u>Porous Car Park Manhole: 36a, DS/PN: 7.003</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 9.6 Membrane Percolation (mm/hr) 1000 Length (m) 4.8 Max Percolation (l/s) 12.8 Slope (1:X) 100.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 34.850 Membrane Depth (mm) 130 <u>Porous Car Park Manhole: 11a, DS/PN: 8.001</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 9.6 Membrane Percolation (mm/hr) 1000 Length (m) 4.8 Max Percolation (l/s) 12.8 Slope (1:X) 100.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 36.440 Membrane Depth (mm) 130 <u>Porous Car Park Manhole: 10a, DS/PN: 9.001</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 12.0 Membrane Percolation (mm/hr) 1000 Length (m) 4.8 Max Percolation (l/s) 16.0 Slope (1:X) 100.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 37.000 Membrane Depth (mm) 130 <u>Porous Car Park Manhole: 9a, DS/PN: 10.001</u> Infiltration Coefficient Base (m/hr) 0.00000 Invert Level (m) 37.400 Membrane Percolation (mm/hr) 1000 Width (m) 4.8 Max Percolation (l/s) 6.4 Length (m) 4.8 Safety Factor 2.0 Slope (1:X) 100.0 Porosity 0.30 Depression Storage (mm) 5		
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<u>Porous Car Park Manhole: 9a, DS/PN: 10.001</u> Evaporation (mm/day) 3 Membrane Depth (mm) 130 <u>Porous Car Park Manhole: 1a, DS/PN: 11.001</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>4.8</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>11.6</td></tr><tr><td>Max Percolation (l/s)</td><td>15.5</td><td>Slope (1:X)</td><td>33.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>44.290</td><td>Membrane Depth (mm)</td><td>130</td></tr></table> <u>Porous Car Park Manhole: 3a, DS/PN: 12.001</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>6.0</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>4.8</td></tr><tr><td>Max Percolation (l/s)</td><td>8.0</td><td>Slope 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(m/hr)</td><td>0.00000</td><td>Width (m)</td><td>6.0</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>4.8</td></tr><tr><td>Max Percolation (l/s)</td><td>8.0</td><td>Slope (1:X)</td><td>100.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>37.200</td><td>Membrane Depth (mm)</td><td>130</td></tr></table> <u>Porous Car Park Manhole: 37a, DS/PN: 15.001</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>5.4</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>4.8</td></tr><tr><td>Max Percolation (l/s)</td><td>7.2</td><td>Slope (1:X)</td><td>100.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation 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(mm)	130	Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.0	Membrane Percolation (mm/hr)	1000	Length (m)	4.8	Max Percolation (l/s)	8.0	Slope (1:X)	100.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	42.710	Membrane Depth (mm)	130	Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	16.0	Membrane Percolation (mm/hr)	1000	Length (m)	9.6	Max Percolation (l/s)	42.7	Slope (1:X)	100.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	39.320	Membrane Depth (mm)	130	Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.0	Membrane Percolation (mm/hr)	1000	Length (m)	4.8	Max Percolation (l/s)	8.0	Slope (1:X)	100.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	37.200	Membrane Depth (mm)	130	Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.4	Membrane Percolation (mm/hr)	1000	Length (m)	4.8	Max Percolation (l/s)	7.2	Slope 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Porous Car Park Manhole: 42a, DS/PN: 17.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.2
Membrane Percolation (mm/hr)	1000	Length (m)	5.0
Max Percolation (l/s)	10.0	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	34.900	Membrane Depth (mm)	130

Tank or Pond Manhole: 46 HW, DS/PN: 1.018

Invert Level (m) 27.350

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	340.0	1.950	652.0

Cellular Storage Manhole: 77, DS/PN: 1.021

Invert Level (m)	21.812	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	240.5	0.0	0.400	240.5	0.0	0.401	0.0	0.0

Cellular Storage Manhole: 51 FC, DS/PN: 1.022

Invert Level (m)	21.600	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	327.0	0.0	0.400	327.0	0.0	0.401	0.0	0.0

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Innovyze	Network 2020.1.3	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 Hot Start Level (mm) 0 Inlet 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 20 Number of Storage Structures 23 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.400 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	13a	30 Winter	1	+0%					43.608	-0.092
2.000	dummy13	15 Summer	1	+0%	100/15 Summer				43.551	-0.150
2.001	13b	30 Winter	1	+0%	30/15 Summer				43.540	-0.020
1.001	13	30 Winter	1	+0%					42.403	-0.197
3.000	14c	15 Summer	1	+0%	100/60 Winter				42.680	-0.150
3.001	14b	60 Winter	1	+0%	30/15 Winter				42.628	-0.072
4.000	14a	30 Summer	1	+0%					42.906	-0.144
1.002	14	30 Winter	1	+0%					41.711	-0.189
1.003	15	30 Winter	1	+0%					41.012	-0.178
1.004	16	15 Winter	1	+0%					40.761	-0.239
1.005	17	15 Winter	1	+0%	100/15 Summer				40.232	-0.268
1.006	18	15 Winter	1	+0%	100/15 Summer				40.140	-0.249
1.007	19	15 Winter	1	+0%	100/15 Summer				40.002	-0.243
5.000	dummy30	60 Winter	1	+0%	30/60 Winter				42.525	-0.125
5.001	30a	60 Winter	1	+0%	30/15 Summer				42.525	-0.065
1.008	30	15 Winter	1	+0%					39.904	-0.290
1.009	31	15 Winter	1	+0%					39.285	-0.302
1.010	32	15 Winter	1	+0%					37.692	-0.295
1.011	33	15 Winter	1	+0%					35.944	-0.273
6.000	dummy34	15 Winter	1	+0%	30/30 Winter				37.772	-0.117
6.001	34b	60 Winter	1	+0%	30/15 Summer	100/60 Winter			37.744	-0.056
6.002	34a	30 Winter	1	+0%	30/15 Summer	100/30 Winter			37.050	-0.050
1.012	34	15 Winter	1	+0%					35.497	-0.261
1.013	35	15 Winter	1	+0%					35.152	-0.285
7.000	36d	15 Summer	1	+0%					36.020	-0.150
7.001	36c	60 Winter	1	+0%	100/15 Summer				35.959	-0.091
7.002	36b	30 Winter	1	+0%	30/15 Summer				35.302	-0.048
7.003	36a	120 Winter	1	+0%	30/60 Winter				34.923	-0.077
1.014	36	15 Winter	1	+0%					33.708	-0.295
8.000	dummy11	60 Winter	1	+0%	30/15 Summer				36.571	-0.074

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

PN	US/MH Name	Flooded		Half Drain		Pipe	Level	
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)	Status	Exceeded	
1.000	13a	0.000	0.02		4 0.5	OK		
2.000	dummy13	0.000	0.00		0.0	OK		
2.001	13b	0.000	0.02	12	1.0	OK		
1.001	13	0.000	0.04		3.5	OK		
3.000	14c	0.000	0.00		0.0	OK		
3.001	14b	0.000	0.01	16	0.4	OK		
4.000	14a	0.000	0.01	2	0.5	OK		
1.002	14	0.000	0.06		5.4	OK		
1.003	15	0.000	0.10		5.8	OK		
1.004	16	0.000	0.09		10.8	OK		
1.005	17	0.000	0.18		18.1	OK		
1.006	18	0.000	0.24		25.3	OK		
1.007	19	0.000	0.27		25.0	OK		
5.000	dummy30	0.000	0.00		0.0	OK		
5.001	30a	0.000	0.00	27	0.4	OK		
1.008	30	0.000	0.12		29.0	OK		
1.009	31	0.000	0.08		33.5	OK		
1.010	32	0.000	0.10		40.5	OK		
1.011	33	0.000	0.16		43.2	OK		
6.000	dummy34	0.000	0.11		1.7	OK		
6.001	34b	0.000	0.02	23	0.8	OK		1
6.002	34a	0.000	0.03	18	1.8	OK		2
1.012	34	0.000	0.20		44.8	OK		
1.013	35	0.000	0.13		45.5	OK		
7.000	36d	0.000	0.00		0.0	OK		
7.001	36c	0.000	0.01	14	0.3	OK		
7.002	36b	0.000	0.03	13	0.8	OK		
7.003	36a	0.000	0.01	28	0.7	OK		
1.014	36	0.000	0.10		48.5	OK		
8.000	dummy11	0.000	0.00		0.0	OK		

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
8.001	11a	60 Winter	1	+0%	30/15 Summer				36.571
8.002	11	15 Winter	1	+0%	100/15 Summer				35.626
9.000	dummy10	60 Winter	1	+0%	30/15 Winter				37.115
9.001	10a	60 Winter	1	+0%	30/15 Summer				37.115
8.003	10	15 Winter	1	+0%	100/15 Summer				35.558
10.000	dummy9	60 Winter	1	+0%	100/15 Summer				37.476
10.001	9a	60 Winter	1	+0%	30/15 Winter				37.476
8.004	9	15 Winter	1	+0%	30/15 Summer				35.411
11.000	dummy1	60 Winter	1	+0%	30/30 Winter				44.391
11.001	1a	60 Winter	1	+0%	30/15 Summer				44.391
11.002	1	15 Winter	1	+0%					43.173
11.003	2	15 Winter	1	+0%					42.485
12.000	dummy3	60 Winter	1	+0%	30/30 Winter				42.804
12.001	3a	60 Winter	1	+0%	30/15 Summer				42.804
11.004	3	15 Winter	1	+0%					41.871
11.005	4	15 Winter	1	+0%					39.626
11.006	5	15 Winter	1	+0%					38.817
13.000	dummy6	15 Summer	1	+0%	100/15 Winter				39.475
13.001	6a	240 Winter	1	+0%	30/15 Summer				39.459
11.007	6	15 Winter	1	+0%					38.259
11.008	7	15 Winter	1	+0%					36.681
8.005	8	15 Winter	1	+0%	30/15 Summer				35.157
8.006	12	15 Winter	1	+0%	30/15 Summer				35.106
14.000	dummy23	60 Winter	1	+0%	30/30 Winter				37.287
14.001	23a	60 Winter	1	+0%	30/15 Summer				37.287
8.007	37a	15 Winter	1	+0%	30/15 Summer				35.074
15.000	dummy37	60 Winter	1	+0%	100/15 Summer				37.276
15.001	37a	60 Winter	1	+0%	30/15 Winter				37.277
8.008	37	15 Winter	1	+0%	30/15 Summer				35.025
8.009	38	15 Winter	1	+0%	100/15 Summer				34.894
8.010	39	15 Winter	1	+0%	30/15 Winter				34.600
8.011	40	15 Winter	1	+0%	100/15 Summer				34.543
8.012	41	15 Winter	1	+0%					34.390
16.000	dummy41	15 Summer	1	+0%	30/30 Winter				35.350
16.001	41a	30 Winter	1	+0%	30/15 Summer	100/60 Winter			35.346
8.013	41 J	15 Winter	1	+0%					33.952
17.000	dummy42	15 Summer	1	+0%	100/15 Winter				35.000
17.001	42a	60 Winter	1	+0%	30/30 Winter				34.973
8.014	42	15 Winter	1	+0%					33.710
1.015	43	15 Winter	1	+0%					32.142
1.016	44	15 Winter	1	+0%	100/15 Summer				27.978
1.017	45 HW	15 Winter	1	+0%	30/15 Summer				27.742
1.018	46 HW	240 Winter	1	+0%	30/60 Summer				27.675
1.019	47 FC	240 Winter	1	+0%	1/30 Summer				27.689
1.020	49 Tank 1/DD	240 Winter	1	+0%					22.010
1.021	77	240 Winter	1	+0%					21.898
1.022	51 FC	600 Winter	1	+0%	1/120 Summer				21.818

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)		
8.001	11a	-0.019	0.000	0.02		28	1.0		OK
8.002	11	-0.174	0.000	0.11			4.3		OK
9.000	dummy10	-0.101	0.000	0.00			0.0		OK
9.001	10a	-0.035	0.000	0.01		31	0.9		OK

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

		Surcharged Flooded		Half Drain		Pipe		
	US/MH	Depth	Volume	Flow /	Overflow	Time	Flow	Level
PN	Name	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	Status Exceeded
8.003	10	-0.140	0.000	0.30			11.9	OK
10.000	dummy9	-0.131	0.000	0.00			0.0	OK
10.001	9a	-0.074	0.000	0.00		23	0.4	OK
8.004	9	-0.126	0.000	0.40			15.4	OK
11.000	dummy1	-0.109	0.000	0.00			0.0	OK
11.001	1a	-0.049	0.000	0.01		19	0.4	OK
11.002	1	-0.201	0.000	0.03			2.8	OK
11.003	2	-0.198	0.000	0.03			3.8	OK
12.000	dummy3	-0.116	0.000	0.00			0.0	OK
12.001	3a	-0.056	0.000	0.01		29	0.4	OK
11.004	3	-0.183	0.000	0.08			9.8	OK
11.005	4	-0.253	0.000	0.06			13.4	OK
11.006	5	-0.239	0.000	0.09			17.2	OK
13.000	dummy6	-0.150	0.000	0.00			0.0	OK
13.001	6a	-0.011	0.000	0.01		122	0.5	OK
11.007	6	-0.231	0.000	0.12			26.8	OK
11.008	7	-0.319	0.000	0.05			26.8	OK
8.005	8	-0.246	0.000	0.33			45.8	OK
8.006	12	-0.232	0.000	0.47			45.9	OK
14.000	dummy23	-0.113	0.000	0.00			0.0	OK
14.001	23a	-0.063	0.000	0.01		28	0.4	OK
8.007	37a	-0.243	0.000	0.41			48.2	OK
15.000	dummy37	-0.124	0.000	0.00			0.0	OK
15.001	37a	-0.073	0.000	0.00		27	0.4	OK
8.008	37	-0.250	0.000	0.41			49.5	OK
8.009	38	-0.337	0.000	0.14			50.1	OK
8.010	39	-0.238	0.000	0.45			51.0	OK
8.011	40	-0.256	0.000	0.38			54.3	OK
8.012	41	-0.332	0.000	0.16			58.4	OK
16.000	dummy41	-0.150	0.000	0.00			0.0	OK
16.001	41a	-0.054	0.000	0.01		14	0.8	OK
8.013	41 J	-0.298	0.000	0.25			59.3	OK*
17.000	dummy42	-0.150	0.000	0.00			0.0	OK
17.001	42a	-0.077	0.000	0.01		28	0.3	OK
8.014	42	-0.362	0.000	0.08			59.8	OK
1.015	43	-0.358	0.000	0.09			105.5	OK
1.016	44	-0.372	0.000	0.31			105.5	OK
1.017	45 HW	-0.208	0.000	0.75			105.5	OK*
1.018	46 HW	-0.275	0.000	0.04			14.6	OK*
1.019	47 FC	0.164	0.000	0.06			11.8	SURCHARGED
1.020	49 Tank 1/DD	-0.137	0.000	0.33			11.8	OK
1.021	77	-0.139	0.000	0.31		251	11.8	OK
1.022	51 FC	0.068	0.000	0.62		155	9.9	SURCHARGED

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 Hot Start Level (mm) 0 Inlet 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 20 Number of Storage Structures 23 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.400 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	13a	15 Winter	30	+0%					43.615	-0.085
2.000	dummy13	30 Winter	30	+0%	100/15 Summer				43.688	-0.013
2.001	13b	30 Winter	30	+0%	30/15 Summer				43.688	0.128
1.001	13	15 Winter	30	+0%					42.425	-0.175
3.000	14c	60 Winter	30	+0%	100/60 Winter				42.730	-0.100
3.001	14b	60 Winter	30	+0%	30/15 Winter				42.730	0.030
4.000	14a	15 Winter	30	+0%					42.916	-0.134
1.002	14	15 Winter	30	+0%					41.741	-0.159
1.003	15	15 Winter	30	+0%					41.051	-0.139
1.004	16	15 Winter	30	+0%					40.813	-0.187
1.005	17	15 Winter	30	+0%	100/15 Summer				40.335	-0.165
1.006	18	15 Winter	30	+0%	100/15 Summer				40.260	-0.129
1.007	19	15 Winter	30	+0%	100/15 Summer				40.128	-0.117
5.000	dummy30	60 Winter	30	+0%	30/60 Winter				42.662	0.012
5.001	30a	60 Winter	30	+0%	30/15 Summer				42.662	0.072
1.008	30	15 Winter	30	+0%					39.971	-0.223
1.009	31	15 Winter	30	+0%					39.338	-0.249
1.010	32	15 Winter	30	+0%					37.752	-0.235
1.011	33	15 Winter	30	+0%					36.025	-0.192
6.000	dummy34	60 Winter	30	+0%	30/30 Winter				37.902	0.013
6.001	34b	60 Winter	30	+0%	30/15 Summer	100/60 Winter			37.899	0.099
6.002	34a	60 Winter	30	+0%	30/15 Summer	100/30 Winter			37.202	0.102
1.012	34	15 Winter	30	+0%					35.588	-0.170
1.013	35	15 Winter	30	+0%					35.221	-0.216
7.000	36d	60 Winter	30	+0%					36.043	-0.127
7.001	36c	60 Winter	30	+0%	100/15 Summer				36.045	-0.005
7.002	36b	60 Winter	30	+0%	30/15 Summer				35.433	0.083
7.003	36a	120 Winter	30	+0%	30/60 Winter				35.020	0.020
1.014	36	15 Winter	30	+0%					33.766	-0.237
8.000	dummy11	60 Winter	30	+0%	30/15 Summer				36.792	0.147

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

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
1.000	13a	0.000	0.05			5 1.6	OK	
2.000	dummy13	0.000	0.00			0.0	OK	
2.001	13b	0.000	0.03			20 1.5	SURCHARGED	
1.001	13	0.000	0.11			10.8	OK	
3.000	14c	0.000	0.00			0.0	OK	
3.001	14b	0.000	0.01			27 0.6	SURCHARGED	
4.000	14a	0.000	0.02			4 1.6	OK	
1.002	14	0.000	0.18			17.1	OK	
1.003	15	0.000	0.30			18.3	OK	
1.004	16	0.000	0.29			34.7	OK	
1.005	17	0.000	0.55			56.8	OK	
1.006	18	0.000	0.73			76.3	OK	
1.007	19	0.000	0.81			74.7	OK	
5.000	dummy30	0.000	0.00			0.0	SURCHARGED	
5.001	30a	0.000	0.01			39 0.6	SURCHARGED	
1.008	30	0.000	0.34			84.4	OK	
1.009	31	0.000	0.24			95.6	OK	
1.010	32	0.000	0.29			115.7	OK	
1.011	33	0.000	0.47			123.9	OK	
6.000	dummy34	0.000	0.14			2.2	SURCHARGED	
6.001	34b	0.000	0.03			33 1.4	SURCHARGED	1
6.002	34a	0.000	0.06			30 3.1	FLOOD RISK	2
1.012	34	0.000	0.57			125.6	OK	
1.013	35	0.000	0.37			127.9	OK	
7.000	36d	0.000	0.00			0.0	OK	
7.001	36c	0.000	0.01			24 0.5	OK	
7.002	36b	0.000	0.05			27 1.3	SURCHARGED	
7.003	36a	0.000	0.02			38 1.1	SURCHARGED	
1.014	36	0.000	0.29			136.4	OK	
8.000	dummy11	0.000	0.00			0.0	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
8.001	11a	60 Winter	30	+0%	30/15 Summer				36.792
8.002	11	15 Winter	30	+0%	100/15 Summer				35.708
9.000	dummy10	60 Winter	30	+0%	30/15 Winter				37.299
9.001	10a	60 Winter	30	+0%	30/15 Summer				37.299
8.003	10	15 Winter	30	+0%	100/15 Summer				35.686
10.000	dummy9	60 Winter	30	+0%	100/15 Summer				37.597
10.001	9a	60 Winter	30	+0%	30/15 Winter				37.597
8.004	9	15 Winter	30	+0%	30/15 Summer				35.569
11.000	dummy1	60 Winter	30	+0%	30/30 Winter				44.513
11.001	1a	60 Winter	30	+0%	30/15 Summer				44.513
11.002	1	15 Winter	30	+0%					43.192
11.003	2	15 Winter	30	+0%					42.507
12.000	dummy3	60 Winter	30	+0%	30/30 Winter				42.954
12.001	3a	60 Winter	30	+0%	30/15 Summer				42.954
11.004	3	15 Winter	30	+0%					41.903
11.005	4	15 Winter	30	+0%					39.665
11.006	5	15 Winter	30	+0%					38.864
13.000	dummy6	240 Winter	30	+0%	100/15 Winter				39.624
13.001	6a	240 Winter	30	+0%	30/15 Summer				39.624
11.007	6	15 Winter	30	+0%					38.315
11.008	7	15 Winter	30	+0%					36.727
8.005	8	15 Winter	30	+0%	30/15 Summer				35.414
8.006	12	15 Winter	30	+0%	30/15 Summer				35.357
14.000	dummy23	60 Winter	30	+0%	30/30 Winter				37.426
14.001	23a	60 Winter	30	+0%	30/15 Summer				37.426
8.007	37a	15 Summer	30	+0%	30/15 Summer				35.327
15.000	dummy37	60 Winter	30	+0%	100/15 Summer				37.391
15.001	37a	60 Winter	30	+0%	30/15 Winter				37.391
8.008	37	15 Summer	30	+0%	30/15 Summer				35.275
8.009	38	15 Winter	30	+0%	100/15 Summer				34.978
8.010	39	15 Winter	30	+0%	30/15 Winter				34.842
8.011	40	15 Winter	30	+0%	100/15 Summer				34.797
8.012	41	15 Winter	30	+0%					34.471
16.000	dummy41	30 Winter	30	+0%	30/30 Winter				35.505
16.001	41a	30 Winter	30	+0%	30/15 Summer	100/60 Winter			35.505
8.013	41 J	15 Winter	30	+0%					34.064
17.000	dummy42	60 Winter	30	+0%	100/15 Winter				35.080
17.001	42a	60 Winter	30	+0%	30/30 Winter				35.080
8.014	42	15 Winter	30	+0%					33.763
1.015	43	15 Winter	30	+0%					32.198
1.016	44	360 Winter	30	+0%	100/15 Summer				28.250
1.017	45 HW	360 Winter	30	+0%	30/15 Summer				28.249
1.018	46 HW	360 Winter	30	+0%	30/60 Summer				28.247
1.019	47 FC	360 Winter	30	+0%	1/30 Summer				28.311
1.020	49 Tank 1/DD	1440 Winter	30	+0%					22.016
1.021	77	1440 Winter	30	+0%					21.985
1.022	51 FC	1440 Winter	30	+0%	1/120 Summer				21.957

PN	US/MH Name	Surcharged Flooded			Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)			
8.001	11a	0.202	0.000	0.03		41	1.6	SURCHARGED	
8.002	11	-0.092	0.000	0.32			12.0	OK	
9.000	dummy10	0.083	0.000	0.00			0.0	SURCHARGED	
9.001	10a	0.149	0.000	0.02		46	1.5	SURCHARGED	

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

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)						
8.003	10	-0.012	0.000	0.84			32.6	OK	
10.000	dummy9	-0.010	0.000	0.00			0.0	OK	
10.001	9a	0.047	0.000	0.01		35	0.6	SURCHARGED	
8.004	9	0.032	0.000	1.08			41.6	SURCHARGED	
11.000	dummy1	0.013	0.000	0.00			0.0	SURCHARGED	
11.001	1a	0.073	0.000	0.01		33	0.6	SURCHARGED	
11.002	1	-0.182	0.000	0.08			8.6	OK	
11.003	2	-0.176	0.000	0.11			12.0	OK	
12.000	dummy3	0.034	0.000	0.00			0.0	SURCHARGED	
12.001	3a	0.094	0.000	0.01		44	0.7	SURCHARGED	
11.004	3	-0.151	0.000	0.24			30.4	OK	
11.005	4	-0.214	0.000	0.18			41.5	OK	
11.006	5	-0.192	0.000	0.28			53.3	OK	
13.000	dummy6	-0.001	0.000	0.00			0.0	OK	
13.001	6a	0.154	0.000	0.01		201	0.8	SURCHARGED	
11.007	6	-0.175	0.000	0.36			82.7	OK	
11.008	7	-0.273	0.000	0.17			82.4	OK	
8.005	8	0.011	0.000	0.96			133.4	SURCHARGED	
8.006	12	0.019	0.000	1.37			132.3	SURCHARGED	
14.000	dummy23	0.026	0.000	0.00			0.0	SURCHARGED	
14.001	23a	0.076	0.000	0.01		43	0.7	SURCHARGED	
8.007	37a	0.010	0.000	1.14			133.4	SURCHARGED	
15.000	dummy37	-0.009	0.000	0.00			0.1	OK	
15.001	37a	0.041	0.000	0.01		40	0.6	SURCHARGED	
8.008	37	0.000	0.000	1.12			135.3	SURCHARGED	
8.009	38	-0.253	0.000	0.40			141.5	OK	
8.010	39	0.004	0.000	1.23			139.6	SURCHARGED	
8.011	40	-0.002	0.000	1.01			142.7	OK	
8.012	41	-0.251	0.000	0.40			150.2	OK	
16.000	dummy41	0.005	0.000	0.00			0.0	SURCHARGED	
16.001	41a	0.105	0.000	0.02		21	1.4	SURCHARGED	1
8.013	41 J	-0.186	0.000	0.64			152.4	OK*	
17.000	dummy42	-0.070	0.000	0.00			0.0	OK	
17.001	42a	0.030	0.000	0.01		44	0.6	SURCHARGED	
8.014	42	-0.309	0.000	0.22			153.1	OK	
1.015	43	-0.302	0.000	0.24			275.2	OK	
1.016	44	-0.100	0.000	0.18			62.8	OK	
1.017	45 HW	0.299	0.000	0.45			62.6	SURCHARGED*	
1.018	46 HW	0.297	0.000	0.07			22.6	SURCHARGED*	
1.019	47 FC	0.786	0.000	0.06			12.0	SURCHARGED	
1.020	49 Tank 1/DD	-0.131	0.000	0.33			12.0	OK	
1.021	77	-0.052	0.000	0.32		150	12.0	OK	
1.022	51 FC	0.207	0.000	0.65		223	10.3	SURCHARGED	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 Hot Start Level (mm) 0 Inlet 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 20 Number of Storage Structures 23 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.400 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	13a	15 Winter	100	+40%					43.621	-0.079
2.000	dummy13	60 Winter	100	+40%	100/15 Summer				43.874	0.173
2.001	13b	60 Winter	100	+40%	30/15 Summer				43.874	0.314
1.001	13	15 Winter	100	+40%					42.443	-0.157
3.000	14c	60 Winter	100	+40%	100/60 Winter				42.842	0.012
3.001	14b	60 Winter	100	+40%	30/15 Winter				42.842	0.142
4.000	14a	15 Winter	100	+40%					42.920	-0.130
1.002	14	15 Winter	100	+40%					41.764	-0.136
1.003	15	15 Winter	100	+40%					41.084	-0.106
1.004	16	15 Winter	100	+40%					40.858	-0.142
1.005	17	15 Winter	100	+40%	100/15 Summer				40.623	0.123
1.006	18	15 Winter	100	+40%	100/15 Summer				40.524	0.135
1.007	19	15 Winter	100	+40%	100/15 Summer				40.290	0.045
5.000	dummy30	60 Winter	100	+40%	30/60 Winter				42.884	0.234
5.001	30a	60 Winter	100	+40%	30/15 Summer				42.884	0.294
1.008	30	15 Winter	100	+40%					40.033	-0.161
1.009	31	15 Winter	100	+40%					39.387	-0.200
1.010	32	15 Winter	100	+40%					37.807	-0.180
1.011	33	15 Winter	100	+40%					36.104	-0.113
6.000	dummy34	60 Winter	100	+40%	30/30 Winter				38.255	0.366
6.001	34b	60 Winter	100	+40%	30/15 Summer	100/60 Winter			38.250	0.450
6.002	34a	60 Winter	100	+40%	30/15 Summer	100/30 Winter			37.501	0.401
1.012	34	15 Winter	100	+40%					35.680	-0.078
1.013	35	15 Winter	100	+40%					35.282	-0.155
7.000	36d	60 Winter	100	+40%					36.134	-0.036
7.001	36c	60 Winter	100	+40%	100/15 Summer				36.134	0.084
7.002	36b	60 Winter	100	+40%	30/15 Summer				35.572	0.222
7.003	36a	180 Winter	100	+40%	30/60 Winter				35.144	0.144
1.014	36	15 Winter	100	+40%					33.817	-0.186
8.000	dummy11	60 Winter	100	+40%	30/15 Summer				37.143	0.498

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

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
1.000	13a	0.000	0.10			5 2.8	OK	
2.000	dummy13	0.000	0.00			0.0	FLOOD RISK	
2.001	13b	0.000	0.04			36 1.9	FLOOD RISK	
1.001	13	0.000	0.20			19.0	OK	
3.000	14c	0.000	0.00			0.0	SURCHARGED	
3.001	14b	0.000	0.02			41 0.7	SURCHARGED	
4.000	14a	0.000	0.04			5 2.9	OK	
1.002	14	0.000	0.33			30.3	OK	
1.003	15	0.000	0.54			32.6	OK	
1.004	16	0.000	0.54			63.7	OK	
1.005	17	0.000	0.94			96.9	SURCHARGED	
1.006	18	0.000	1.24			130.1	SURCHARGED	
1.007	19	0.000	1.42			131.2	SURCHARGED	
5.000	dummy30	0.000	0.00			0.0	SURCHARGED	
5.001	30a	0.000	0.01			53 0.9	FLOOD RISK	
1.008	30	0.000	0.60			149.6	OK	
1.009	31	0.000	0.42			170.2	OK	
1.010	32	0.000	0.50			202.1	OK	
1.011	33	0.000	0.81			214.5	OK	
6.000	dummy34	0.000	0.26			4.0	SURCHARGED	
6.001	34b	0.008	0.05			43 2.2	FLOOD	1
6.002	34a	0.538	0.08			37 4.7	FLOOD	2
1.012	34	0.000	0.98			217.6	OK	
1.013	35	0.000	0.64			219.7	OK	
7.000	36d	0.000	0.00			0.1	OK	
7.001	36c	0.000	0.02			36 0.7	SURCHARGED	
7.002	36b	0.000	0.07			41 1.7	FLOOD RISK	
7.003	36a	0.000	0.02			61 1.5	SURCHARGED	
1.014	36	0.000	0.50			237.4	OK	
8.000	dummy11	0.000	0.00			0.0	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
8.001	11a	60 Winter	100	+40%	30/15 Summer				37.143
8.002	11	15 Winter	100	+40%	100/15 Summer				36.721
9.000	dummy10	120 Winter	100	+40%	30/15 Winter				37.686
9.001	10a	120 Winter	100	+40%	30/15 Summer				37.689
8.003	10	15 Winter	100	+40%	100/15 Summer				36.690
10.000	dummy9	60 Winter	100	+40%	100/15 Summer				37.798
10.001	9a	60 Winter	100	+40%	30/15 Winter				37.798
8.004	9	15 Winter	100	+40%	30/15 Summer				36.413
11.000	dummy1	60 Winter	100	+40%	30/30 Winter				44.641
11.001	1a	60 Winter	100	+40%	30/15 Summer				44.641
11.002	1	15 Winter	100	+40%					43.206
11.003	2	15 Winter	100	+40%					42.525
12.000	dummy3	120 Winter	100	+40%	30/30 Winter				43.196
12.001	3a	120 Winter	100	+40%	30/15 Summer				43.197
11.004	3	15 Winter	100	+40%					41.932
11.005	4	15 Winter	100	+40%					39.697
11.006	5	15 Winter	100	+40%					38.908
13.000	dummy6	240 Winter	100	+40%	100/15 Winter				39.897
13.001	6a	240 Winter	100	+40%	30/15 Summer				39.897
11.007	6	15 Winter	100	+40%					38.368
11.008	7	15 Winter	100	+40%					36.766
8.005	8	15 Winter	100	+40%	30/15 Summer				36.010
8.006	12	15 Winter	100	+40%	30/15 Summer				35.853
14.000	dummy23	60 Winter	100	+40%	30/30 Winter				37.649
14.001	23a	60 Winter	100	+40%	30/15 Summer				37.649
8.007	37a	15 Winter	100	+40%	30/15 Summer				35.702
15.000	dummy37	60 Winter	100	+40%	100/15 Summer				37.576
15.001	37a	60 Winter	100	+40%	30/15 Winter				37.576
8.008	37	15 Winter	100	+40%	30/15 Summer				35.526
8.009	38	15 Winter	100	+40%	100/15 Summer				35.343
8.010	39	15 Winter	100	+40%	30/15 Winter				35.162
8.011	40	15 Winter	100	+40%	100/15 Summer				34.971
8.012	41	15 Winter	100	+40%					34.567
16.000	dummy41	60 Winter	100	+40%	30/30 Winter				35.850
16.001	41a	60 Winter	100	+40%	30/15 Summer	100/60 Winter			35.850
8.013	41 J	15 Summer	100	+40%					34.250
17.000	dummy42	120 Winter	100	+40%	100/15 Winter				35.254
17.001	42a	120 Winter	100	+40%	30/30 Winter				35.254
8.014	42	15 Winter	100	+40%					33.819
1.015	43	15 Winter	100	+40%					32.259
1.016	44	480 Winter	100	+40%	100/15 Summer				29.064
1.017	45	HW 1440 Summer	100	+40%	30/15 Summer				28.300
1.018	46	HW 480 Winter	100	+40%	30/60 Summer				29.061
1.019	47	FC 480 Winter	100	+40%	1/30 Summer				29.124
1.020	49 Tank 1/DD	1440 Winter	100	+40%					22.045
1.021	77	1440 Winter	100	+40%					22.024
1.022	51	FC 1440 Winter	100	+40%	1/120 Summer				21.996

PN	US/MH Name	Surcharged Flooded			Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Time (mins)	Flow (l/s)			
8.001	11a	0.553	0.000	0.04	55	2.4	FLOOD RISK		
8.002	11	0.921	0.000	0.50		18.5	SURCHARGED		
9.000	dummy10	0.470	0.000	0.01		0.1	FLOOD RISK		
9.001	10a	0.539	0.000	0.03	72	2.3	FLOOD RISK		

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

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)						
8.003	10	0.992	0.000	1.33			51.7	SURCHARGED	
10.000	dummy9	0.191	0.000	0.00			0.0	SURCHARGED	
10.001	9a	0.248	0.000	0.01		47	0.9	SURCHARGED	
8.004	9	0.876	0.000	1.72			66.1	SURCHARGED	
11.000	dummy1	0.141	0.000	0.00			0.0	FLOOD RISK	
11.001	1a	0.201	0.000	0.01		50	0.8	FLOOD RISK	
11.002	1	-0.168	0.000	0.14			15.3	OK	
11.003	2	-0.158	0.000	0.19			21.5	OK	
12.000	dummy3	0.276	0.000	0.00			0.0	SURCHARGED	
12.001	3a	0.337	0.000	0.02		69	1.0	SURCHARGED	
11.004	3	-0.122	0.000	0.43			54.6	OK	
11.005	4	-0.182	0.000	0.33			74.8	OK	
11.006	5	-0.148	0.000	0.51			96.2	OK	
13.000	dummy6	0.272	0.000	0.00			0.0	SURCHARGED	
13.001	6a	0.427	0.000	0.02		249	1.1	SURCHARGED	
11.007	6	-0.122	0.000	0.66			149.3	OK	
11.008	7	-0.234	0.000	0.30			148.9	OK	
8.005	8	0.607	0.000	1.65			229.4	SURCHARGED	
8.006	12	0.515	0.000	2.34			227.1	SURCHARGED	
14.000	dummy23	0.249	0.000	0.00			0.0	SURCHARGED	
14.001	23a	0.299	0.000	0.01		56	0.9	SURCHARGED	
8.007	37a	0.385	0.000	2.03			237.7	SURCHARGED	
15.000	dummy37	0.176	0.000	0.01			0.1	SURCHARGED	
15.001	37a	0.226	0.000	0.01		53	0.9	SURCHARGED	
8.008	37	0.251	0.000	1.99			240.0	SURCHARGED	
8.009	38	0.112	0.000	0.69			243.8	SURCHARGED	
8.010	39	0.324	0.000	2.16			244.1	SURCHARGED	
8.011	40	0.172	0.000	1.83			260.3	SURCHARGED	
8.012	41	-0.155	0.000	0.74			278.7	OK	
16.000	dummy41	0.350	0.000	0.00			0.1	SURCHARGED	
16.001	41a	0.450	0.057	0.03		33	2.2	FLOOD	1
8.013	41 J	0.000	0.000	1.09			258.2	SURCHARGED*	
17.000	dummy42	0.104	0.000	0.00			0.0	SURCHARGED	
17.001	42a	0.204	0.000	0.01		69	0.8	FLOOD RISK	
8.014	42	-0.253	0.000	0.39			278.4	OK	
1.015	43	-0.241	0.000	0.44			503.4	OK	
1.016	44	0.714	0.000	0.26			90.6	FLOOD RISK	
1.017	45 HW	0.350	0.000	0.40			55.4	SURCHARGED*	
1.018	46 HW	1.111	0.000	0.12			43.0	FLOOD RISK*	
1.019	47 FC	1.599	0.000	0.06			12.1	FLOOD RISK	
1.020	49 Tank 1/DD	-0.102	0.000	0.33			12.0	OK	
1.021	77	-0.013	0.000	0.32		169	12.0	OK	
1.022	51 FC	0.246	0.000	0.65		246	10.3	SURCHARGED	