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5 Manchester Square London W1U 3PD	Ratby Phase 2 Reserved Matters Submission SWS Drainage Results	
Date 31/10/2024 File 241029 Combined Network...	Designed by J.Nicholson Checked by L. Hulka	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.651	4-8	0.969	8-12	0.053

Total Area Contributing (ha) = 1.672

Total Pipe Volume (m³) = 71.905

Network Design Table for Storm

- Indicates pipe length does not match coordinates
« - 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
S1.000	13.053	0.130	100.4	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	14.474	0.225	64.3	0.017	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	13.479	0.345	39.1	0.026	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	17.183	0.150	114.6	0.028	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)
S1.000	50.00	5.22	109.800	0.017	0.0	0.0	0.0	1.00	17.7	3.1
S1.001	50.00	5.41	109.670	0.034	0.0	0.0	0.0	1.26	22.2	6.1
S1.002	50.00	5.55	109.445	0.060	0.0	0.0	0.0	1.62	28.5	10.8
S1.003	50.00	5.85	109.100	0.088	0.0	0.0	0.0	0.94	16.6	15.9

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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
S1.004	26.243	0.160	164.0	0.013	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.005	15.858	0.100	158.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.006	15.249	0.100	152.5	0.040	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	15.552	0.090	172.8	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.008	16.353	0.070	233.6	0.024	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	29.122	1.025	28.4	0.042	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.009	15.217	0.065	234.1	0.053	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.010	11.845	0.050	236.9	0.025	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.011	6.592	0.030	219.7	0.029	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.012	11.183	0.050	223.7	0.020	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.013	13.283	0.060	221.4	0.021	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.014	15.080	0.065	232.0	0.040	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.015	24.694	0.670	36.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.016	43.802	0.115	380.9	0.091	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.017	18.704	0.050	374.1	0.020	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	19.620	0.120	163.5	0.031	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	16.931	0.105	161.2	0.060	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.002	13.585	0.085	159.8	0.055	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.003	16.191	0.070	231.3	0.063	0.00	0.0	0.600	o	300	Pipe/Conduit	

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)
S1.004	50.00	6.28	108.875	0.101	0.0	0.0	0.0	1.02	40.5	18.2
S1.005	50.00	6.54	108.715	0.101	0.0	0.0	0.0	1.04	41.2	18.2
S1.006	50.00	6.78	108.615	0.141	0.0	0.0	0.0	1.06	42.0	25.5
S1.007	50.00	7.04	108.515	0.162	0.0	0.0	0.0	0.99	39.4	29.2
S1.008	50.00	7.31	108.350	0.186	0.0	0.0	0.0	1.02	72.4	33.6
S2.000	50.00	5.26	109.455	0.042	0.0	0.0	0.0	1.90	33.5	7.6
S1.009	50.00	7.55	108.280	0.281	0.0	0.0	0.0	1.02	72.3	50.7
S1.010	50.00	7.75	108.215	0.306	0.0	0.0	0.0	1.02	71.9	55.2
S1.011	50.00	7.85	108.165	0.335	0.0	0.0	0.0	1.06	74.7	60.5
S1.012	50.00	8.03	108.135	0.355	0.0	0.0	0.0	1.05	74.0	64.1
S1.013	50.00	8.24	108.085	0.376	0.0	0.0	0.0	1.05	74.4	67.9
S1.014	50.00	8.48	108.025	0.416	0.0	0.0	0.0	1.03	72.7	75.1
S1.015	50.00	8.61	107.810	0.416	0.0	0.0	0.0	3.36	534.0	75.1
S1.016	50.00	9.31	107.140	0.507	0.0	0.0	0.0	1.04	164.7	91.5
S1.017	50.00	9.61	107.025	0.527	0.0	0.0	0.0	1.05	166.2	95.1
S3.000	50.00	5.32	109.815	0.031	0.0	0.0	0.0	1.02	40.5	5.6
S3.001	50.00	5.60	109.695	0.091	0.0	0.0	0.0	1.03	40.8	16.4
S3.002	50.00	5.81	109.590	0.146	0.0	0.0	0.0	1.03	41.0	26.4
S3.003	50.00	6.08	109.430	0.209	0.0	0.0	0.0	1.03	72.8	37.7

Pell Frischmann

5 Manchester Square
London
W1U 3PD

Date 31/10/2024
File 241029 Combined Network...

Innovyze

Ratby Phase 2
Reserved Matters Submission
SWS Drainage Results

Designed by J.Nicholson
Checked by L. Hulka

Network 2020.1

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S3.004	12.101	0.260	46.5	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.005	24.644	1.975	12.5	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	27.104	0.310	87.4	0.083	5.00	0.0	0.600	o	150	Pipe/Conduit	
S4.001	26.429	0.405	65.3	0.041	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.018	13.160	0.125	105.3	0.034	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.019	35.784	0.250	143.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.020	5.000#	0.250	20.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S5.000	60.882	0.365	166.8	0.075	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.000	21.832	0.435	50.2	0.032	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.001	17.930	0.110	163.0	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
S5.002	19.389	0.120	161.6	0.075	0.00	0.0	0.600	o	225	Pipe/Conduit	
S5.003	12.475	0.075	166.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.000	18.869	0.190	99.3	0.046	5.00	0.0	0.600	o	150	Pipe/Conduit	
S7.001	23.156	0.215	107.7	0.037	0.00	0.0	0.600	o	225	Pipe/Conduit	
S5.004	25.555	0.410	62.3	0.045	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)
S3.004	50.00	6.16	109.360	0.259	0.0	0.0	0.0	2.31	163.3	46.8
S3.005	50.00	6.26	109.100	0.309	0.0	0.0	0.0	4.47	316.3	55.8
S4.000	50.00	5.42	107.990	0.083	0.0	0.0	0.0	1.08	19.0	15.0
S4.001	50.00	5.69	107.605	0.124	0.0	0.0	0.0	1.62	64.5	22.4
S1.018	50.00	9.70	106.825	0.994	0.0	0.0	0.0	2.37	671.0	179.5
S1.019	50.00	10.00	106.700	0.994	0.0	0.0	0.0	2.03	575.0	179.5
S1.020	50.00	10.01	106.450	0.994	0.0	0.0	0.0	5.46	1544.3	179.5
S5.000	50.00	6.01	109.640	0.075	0.0	0.0	0.0	1.01	40.1	13.5
S6.000	50.00	5.20	109.710	0.032	0.0	0.0	0.0	1.85	73.6	5.8
S5.001	50.00	6.30	109.275	0.117	0.0	0.0	0.0	1.02	40.6	21.1
S5.002	50.00	6.61	109.165	0.192	0.0	0.0	0.0	1.03	40.8	34.7
S5.003	50.00	6.82	109.045	0.192	0.0	0.0	0.0	1.01	40.2	34.7
S7.000	50.00	5.31	109.450	0.046	0.0	0.0	0.0	1.01	17.8	8.3
S7.001	50.00	5.62	109.185	0.083	0.0	0.0	0.0	1.26	50.1	15.0
S5.004	50.00	7.03	108.895	0.320	0.0	0.0	0.0	1.99	141.0	57.8

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PIPELINE SCHEDULES for Storm

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	150	SW01	111.150	109.800	1.200	Open Manhole	1200
S1.001	o	150	SW02	111.020	109.670	1.200	Open Manhole	1200
S1.002	o	150	SW03	110.795	109.445	1.200	Open Manhole	1200
S1.003	o	150	SW04	110.450	109.100	1.200	Open Manhole	1200
S1.004	o	225	SW05	110.325	108.875	1.225	Open Manhole	1200
S1.005	o	225	SW06	110.155	108.715	1.215	Open Manhole	1200
S1.006	o	225	SW07	110.335	108.615	1.495	Open Manhole	1200
S1.007	o	225	SW08	110.135	108.515	1.395	Open Manhole	1200
S1.008	o	300	SW09	109.995	108.350	1.345	Open Manhole	1200
S2.000	o	150	SW10	110.805	109.455	1.200	Open Manhole	1200
S1.009	o	300	SW11	110.075	108.280	1.495	Open Manhole	1200
S1.010	o	300	SW12	109.950	108.215	1.435	Open Manhole	1200
S1.011	o	300	SW13	109.885	108.165	1.420	Open Manhole	1200
S1.012	o	300	SW14	109.825	108.135	1.390	Open Manhole	1200
S1.013	o	300	SW15	109.730	108.085	1.345	Open Manhole	1200
S1.014	o	300	SW16	109.585	108.025	1.260	Open Manhole	1200
S1.015	o	450	SW17	109.235	107.810	0.975	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	13.053	100.4	SW02	111.020	109.670	1.200	Open Manhole	1200
S1.001	14.474	64.3	SW03	110.795	109.445	1.200	Open Manhole	1200
S1.002	13.479	39.1	SW04	110.450	109.100	1.200	Open Manhole	1200
S1.003	17.183	114.6	SW05	110.325	108.950	1.225	Open Manhole	1200
S1.004	26.243	164.0	SW06	110.155	108.715	1.215	Open Manhole	1200
S1.005	15.858	158.6	SW07	110.335	108.615	1.495	Open Manhole	1200
S1.006	15.249	152.5	SW08	110.135	108.515	1.395	Open Manhole	1200
S1.007	15.552	172.8	SW09	109.995	108.425	1.345	Open Manhole	1200
S1.008	16.353	233.6	SW11	110.075	108.280	1.495	Open Manhole	1200
S2.000	29.122	28.4	SW11	110.075	108.430	1.495	Open Manhole	1200
S1.009	15.217	234.1	SW12	109.950	108.215	1.435	Open Manhole	1200
S1.010	11.845	236.9	SW13	109.885	108.165	1.420	Open Manhole	1200
S1.011	6.592	219.7	SW14	109.825	108.135	1.390	Open Manhole	1200
S1.012	11.183	223.7	SW15	109.730	108.085	1.345	Open Manhole	1200
S1.013	13.283	221.4	SW16	109.585	108.025	1.260	Open Manhole	1200
S1.014	15.080	232.0	SW17	109.235	107.960	0.975	Open Manhole	1500
S1.015	24.694	36.9	SW18	108.490	107.140	0.900	Open Manhole	1500

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.016	o	450	SW18	108.490	107.140	0.900	Open Manhole	1500
S1.017	o	450	SW19	109.515	107.025	2.040	Open Manhole	1500
S3.000	o	225	SW20	111.240	109.815	1.200	Open Manhole	1200
S3.001	o	225	SW21	111.450	109.695	1.530	Open Manhole	1200
S3.002	o	225	SW22	111.500	109.590	1.685	Open Manhole	1200
S3.003	o	300	SW23	111.345	109.430	1.615	Open Manhole	1200
S3.004	o	300	SW24	111.035	109.360	1.375	Open Manhole	1200
S3.005	o	300	SW25	110.600	109.100	1.200	Open Manhole	1200
S4.000	o	150	SW26	109.340	107.990	1.200	Open Manhole	1200
S4.001	o	225	SW27	109.650	107.605	1.820	Open Manhole	1200
S1.018	o	600	SW28	109.700	106.825	2.275	Open Manhole	1500
S1.019	o	600	SW29	109.200	106.700	1.900	Open Manhole	1500
S1.020	o	600	SW30	107.800	106.450	0.750	Open Manhole	1500
S5.000	o	225	HD31	111.065	109.640	1.200	Open Manhole	1200
S6.000	o	225	HD32	111.135	109.710	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.016	43.802	380.9	SW19	109.515	107.025	2.040	Open Manhole	1500
S1.017	18.704	374.1	SW28	109.700	106.975	2.275	Open Manhole	1500
S3.000	19.620	163.5	SW21	111.450	109.695	1.530	Open Manhole	1200
S3.001	16.931	161.2	SW22	111.500	109.590	1.685	Open Manhole	1200
S3.002	13.585	159.8	SW23	111.345	109.505	1.615	Open Manhole	1200
S3.003	16.191	231.3	SW24	111.035	109.360	1.375	Open Manhole	1200
S3.004	12.101	46.5	SW25	110.600	109.100	1.200	Open Manhole	1200
S3.005	24.644	12.5	SW28	109.700	107.125	2.275	Open Manhole	1500
S4.000	27.104	87.4	SW27	109.650	107.680	1.820	Open Manhole	1200
S4.001	26.429	65.3	SW28	109.700	107.200	2.275	Open Manhole	1500
S1.018	13.160	105.3	SW29	109.200	106.700	1.900	Open Manhole	1500
S1.019	35.784	143.1	SW30	107.800	106.450	0.750	Open Manhole	1500
S1.020	5.000#	20.0	SW50	107.800	106.200	1.000	Open Manhole	1500
S5.000	60.882	166.8	HD33	111.050	109.275	1.550	Open Manhole	1200
S6.000	21.832	50.2	HD33	111.050	109.275	1.550	Open Manhole	1200

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.001	o	225	HD33	111.050	109.275	1.550	Open Manhole	1200
S5.002	o	225	SW34	110.810	109.165	1.420	Open Manhole	1200
S5.003	o	225	SW35	110.610	109.045	1.340	Open Manhole	1200
S7.000	o	150	SW36	110.800	109.450	1.200	Open Manhole	1200
S7.001	o	225	SW37	110.700	109.185	1.290	Open Manhole	1200
S5.004	o	300	SW38	110.460	108.895	1.265	Open Manhole	1200
S5.005	o	300	SW39	109.985	108.485	1.200	Open Manhole	1200
S8.000	o	225	SW40	110.390	108.965	1.200	Open Manhole	1200
S8.001	o	300	SW41	109.550	108.040	1.210	Open Manhole	1200
S9.000	o	150	SW42	110.450	109.250	1.050	Open Manhole	1200
S8.002	o	300	SW43	109.240	107.740	1.200	Open Manhole	1200
S5.006	o	375	SW44	109.150	107.575	1.200	Open Manhole	1500
S5.007	o	375	SW45	108.980	107.275	1.330	Open Manhole	1500
S10.000	o	150	SW46	109.100	107.750	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.001	17.930	163.0	SW34	110.810	109.165	1.420	Open Manhole	1200
S5.002	19.389	161.6	SW35	110.610	109.045	1.340	Open Manhole	1200
S5.003	12.475	166.3	SW38	110.460	108.970	1.265	Open Manhole	1200
S7.000	18.869	99.3	SW37	110.700	109.260	1.290	Open Manhole	1200
S7.001	23.156	107.7	SW38	110.460	108.970	1.265	Open Manhole	1200
S5.004	25.555	62.3	SW39	109.985	108.485	1.200	Open Manhole	1200
S5.005	23.679	28.4	SW44	109.150	107.650	1.200	Open Manhole	1500
S8.000	36.074	42.4	SW41	109.550	108.115	1.210	Open Manhole	1200
S8.001	25.046	83.5	SW43	109.240	107.740	1.200	Open Manhole	1200
S9.000	52.449	38.6	SW43	109.240	107.890	1.200	Open Manhole	1200
S8.002	9.594	106.6	SW44	109.150	107.650	1.200	Open Manhole	1500
S5.006	7.884	26.3	SW45	108.980	107.275	1.330	Open Manhole	1500
S5.007	30.800	49.7	SW48	107.930	106.655	0.900	Open Manhole	1500
S10.000	19.652	36.4	SW47	108.560	107.210	1.200	Open Manhole	1200

Pell Frischmann		Page 8
5 Manchester Square London W1U 3PD	Ratby Phase 2 Reserved Matters Submission SWS Drainage Results	
Date 31/10/2024 File 241029 Combined Network...	Designed by J.Nicholson Checked by L. Hulka	
Innovyze	Network 2020.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S10.001	o	150	SW47	108.560	107.210	1.200	Open Manhole	1200
S5.008	o	375	SW48	107.930	106.655	0.900	Open Manhole	1500
S5.009	o	375	SW49	107.800	106.500	0.925	Open Manhole	1500
S1.021	o	150	SW50	107.800	106.200	1.450	Open Manhole	1500
S1.022	o	150	SW51	107.800	106.100	1.550	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S10.001	12.367	37.5	SW48	107.930	106.880	0.900	Open Manhole	1500
S5.008	24.710	159.4	SW49	107.800	106.500	0.925	Open Manhole	1500
S5.009	5.000#	16.7	SW50	107.800	106.200	1.225	Open Manhole	1500
S1.021	7.078	70.8	SW51	107.800	106.100	1.550	Open Manhole	1200
S1.022	95.626	18.6		102.500	100.950	1.400	Open Manhole	0

Pell Frischmann			Page 9																																																																																																																																																																																																																																																																																																																																																																													
5 Manchester Square London W1U 3PD		Ratby Phase 2 Reserved Matters Submission SWS Drainage Results																																																																																																																																																																																																																																																																																																																																																																														
Date 31/10/2024 File 241029 Combined Network...		Designed by J.Nicholson Checked by L. Hulka																																																																																																																																																																																																																																																																																																																																																																														
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<u>Area Summary for Storm</u> <table><tr><th>Pipe Number</th><th>PIMP Type</th><th>PIMP Name</th><th>PIMP (%)</th><th>Gross Area (ha)</th><th>Imp. Area (ha)</th><th>Pipe Total (ha)</th></tr><tr><td>1.000</td><td>-</td><td>-</td><td>100</td><td>0.017</td><td>0.017</td><td>0.017</td></tr><tr><td>1.001</td><td>-</td><td>-</td><td>100</td><td>0.017</td><td>0.017</td><td>0.017</td></tr><tr><td>1.002</td><td>-</td><td>-</td><td>100</td><td>0.026</td><td>0.026</td><td>0.026</td></tr><tr><td>1.003</td><td>-</td><td>-</td><td>100</td><td>0.028</td><td>0.028</td><td>0.028</td></tr><tr><td>1.004</td><td>-</td><td>-</td><td>100</td><td>0.013</td><td>0.013</td><td>0.013</td></tr><tr><td>1.005</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>1.006</td><td>-</td><td>-</td><td>100</td><td>0.040</td><td>0.040</td><td>0.040</td></tr><tr><td>1.007</td><td>-</td><td>-</td><td>100</td><td>0.021</td><td>0.021</td><td>0.021</td></tr><tr><td>1.008</td><td>-</td><td>-</td><td>100</td><td>0.024</td><td>0.024</td><td>0.024</td></tr><tr><td>2.000</td><td>-</td><td>-</td><td>100</td><td>0.042</td><td>0.042</td><td>0.042</td></tr><tr><td>1.009</td><td>-</td><td>-</td><td>100</td><td>0.053</td><td>0.053</td><td>0.053</td></tr><tr><td>1.010</td><td>-</td><td>-</td><td>100</td><td>0.025</td><td>0.025</td><td>0.025</td></tr><tr><td>1.011</td><td>-</td><td>-</td><td>100</td><td>0.029</td><td>0.029</td><td>0.029</td></tr><tr><td>1.012</td><td>-</td><td>-</td><td>100</td><td>0.020</td><td>0.020</td><td>0.020</td></tr><tr><td>1.013</td><td>-</td><td>-</td><td>100</td><td>0.021</td><td>0.021</td><td>0.021</td></tr><tr><td>1.014</td><td>-</td><td>-</td><td>100</td><td>0.040</td><td>0.040</td><td>0.040</td></tr><tr><td>1.015</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>1.016</td><td>-</td><td>-</td><td>100</td><td>0.091</td><td>0.091</td><td>0.091</td></tr><tr><td>1.017</td><td>-</td><td>-</td><td>100</td><td>0.020</td><td>0.020</td><td>0.020</td></tr><tr><td>3.000</td><td>-</td><td>-</td><td>100</td><td>0.031</td><td>0.031</td><td>0.031</td></tr><tr><td>3.001</td><td>-</td><td>-</td><td>100</td><td>0.060</td><td>0.060</td><td>0.060</td></tr><tr><td>3.002</td><td>-</td><td>-</td><td>100</td><td>0.055</td><td>0.055</td><td>0.055</td></tr><tr><td>3.003</td><td>-</td><td>-</td><td>100</td><td>0.063</td><td>0.063</td><td>0.063</td></tr><tr><td>3.004</td><td>-</td><td>-</td><td>100</td><td>0.050</td><td>0.050</td><td>0.050</td></tr><tr><td>3.005</td><td>-</td><td>-</td><td>100</td><td>0.050</td><td>0.050</td><td>0.050</td></tr><tr><td>4.000</td><td>-</td><td>-</td><td>100</td><td>0.083</td><td>0.083</td><td>0.083</td></tr><tr><td>4.001</td><td>-</td><td>-</td><td>100</td><td>0.041</td><td>0.041</td><td>0.041</td></tr><tr><td>1.018</td><td>-</td><td>-</td><td>100</td><td>0.034</td><td>0.034</td><td>0.034</td></tr><tr><td>1.019</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>1.020</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>5.000</td><td>-</td><td>-</td><td>100</td><td>0.075</td><td>0.075</td><td>0.075</td></tr><tr><td>6.000</td><td>-</td><td>-</td><td>100</td><td>0.032</td><td>0.032</td><td>0.032</td></tr><tr><td>5.001</td><td>-</td><td>-</td><td>100</td><td>0.010</td><td>0.010</td><td>0.010</td></tr><tr><td>5.002</td><td>-</td><td>-</td><td>100</td><td>0.075</td><td>0.075</td><td>0.075</td></tr><tr><td>5.003</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>7.000</td><td>-</td><td>-</td><td>100</td><td>0.046</td><td>0.046</td><td>0.046</td></tr><tr><td>7.001</td><td>-</td><td>-</td><td>100</td><td>0.037</td><td>0.037</td><td>0.037</td></tr><tr><td>5.004</td><td>-</td><td>-</td><td>100</td><td>0.045</td><td>0.045</td><td>0.045</td></tr><tr><td>5.005</td><td>-</td><td>-</td><td>100</td><td>0.049</td><td>0.049</td><td>0.049</td></tr><tr><td>8.000</td><td>-</td><td>-</td><td>100</td><td>0.132</td><td>0.132</td><td>0.132</td></tr><tr><td>8.001</td><td>-</td><td>-</td><td>100</td><td>0.055</td><td>0.055</td><td>0.055</td></tr><tr><td>9.000</td><td>-</td><td>-</td><td>100</td><td>0.071</td><td>0.071</td><td>0.071</td></tr><tr><td>8.002</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>5.006</td><td>-</td><td>-</td><td>100</td><td>0.019</td><td>0.019</td><td>0.019</td></tr><tr><td>5.007</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>10.000</td><td>-</td><td>-</td><td>100</td><td>0.032</td><td>0.032</td><td>0.032</td></tr><tr><td>10.001</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>5.008</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>5.009</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>1.021</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>1.022</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr></table>					Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)	1.000	-	-	100	0.017	0.017	0.017	1.001	-	-	100	0.017	0.017	0.017	1.002	-	-	100	0.026	0.026	0.026	1.003	-	-	100	0.028	0.028	0.028	1.004	-	-	100	0.013	0.013	0.013	1.005	-	-	100	0.000	0.000	0.000	1.006	-	-	100	0.040	0.040	0.040	1.007	-	-	100	0.021	0.021	0.021	1.008	-	-	100	0.024	0.024	0.024	2.000	-	-	100	0.042	0.042	0.042	1.009	-	-	100	0.053	0.053	0.053	1.010	-	-	100	0.025	0.025	0.025	1.011	-	-	100	0.029	0.029	0.029	1.012	-	-	100	0.020	0.020	0.020	1.013	-	-	100	0.021	0.021	0.021	1.014	-	-	100	0.040	0.040	0.040	1.015	-	-	100	0.000	0.000	0.000	1.016	-	-	100	0.091	0.091	0.091	1.017	-	-	100	0.020	0.020	0.020	3.000	-	-	100	0.031	0.031	0.031	3.001	-	-	100	0.060	0.060	0.060	3.002	-	-	100	0.055	0.055	0.055	3.003	-	-	100	0.063	0.063	0.063	3.004	-	-	100	0.050	0.050	0.050	3.005	-	-	100	0.050	0.050	0.050	4.000	-	-	100	0.083	0.083	0.083	4.001	-	-	100	0.041	0.041	0.041	1.018	-	-	100	0.034	0.034	0.034	1.019	-	-	100	0.000	0.000	0.000	1.020	-	-	100	0.000	0.000	0.000	5.000	-	-	100	0.075	0.075	0.075	6.000	-	-	100	0.032	0.032	0.032	5.001	-	-	100	0.010	0.010	0.010	5.002	-	-	100	0.075	0.075	0.075	5.003	-	-	100	0.000	0.000	0.000	7.000	-	-	100	0.046	0.046	0.046	7.001	-	-	100	0.037	0.037	0.037	5.004	-	-	100	0.045	0.045	0.045	5.005	-	-	100	0.049	0.049	0.049	8.000	-	-	100	0.132	0.132	0.132	8.001	-	-	100	0.055	0.055	0.055	9.000	-	-	100	0.071	0.071	0.071	8.002	-	-	100	0.000	0.000	0.000	5.006	-	-	100	0.019	0.019	0.019	5.007	-	-	100	0.000	0.000	0.000	10.000	-	-	100	0.032	0.032	0.032	10.001	-	-	100	0.000	0.000	0.000	5.008	-	-	100	0.000	0.000	0.000	5.009	-	-	100	0.000	0.000	0.000	1.021	-	-	100	0.000	0.000	0.000	1.022	-	-	100	0.000	0.000	0.000
Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)																																																																																																																																																																																																																																																																																																																																																																										
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1.001	-	-	100	0.017	0.017	0.017																																																																																																																																																																																																																																																																																																																																																																										
1.002	-	-	100	0.026	0.026	0.026																																																																																																																																																																																																																																																																																																																																																																										
1.003	-	-	100	0.028	0.028	0.028																																																																																																																																																																																																																																																																																																																																																																										
1.004	-	-	100	0.013	0.013	0.013																																																																																																																																																																																																																																																																																																																																																																										
1.005	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																																																										
1.006	-	-	100	0.040	0.040	0.040																																																																																																																																																																																																																																																																																																																																																																										
1.007	-	-	100	0.021	0.021	0.021																																																																																																																																																																																																																																																																																																																																																																										
1.008	-	-	100	0.024	0.024	0.024																																																																																																																																																																																																																																																																																																																																																																										
2.000	-	-	100	0.042	0.042	0.042																																																																																																																																																																																																																																																																																																																																																																										
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1.010	-	-	100	0.025	0.025	0.025																																																																																																																																																																																																																																																																																																																																																																										
1.011	-	-	100	0.029	0.029	0.029																																																																																																																																																																																																																																																																																																																																																																										
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1.013	-	-	100	0.021	0.021	0.021																																																																																																																																																																																																																																																																																																																																																																										
1.014	-	-	100	0.040	0.040	0.040																																																																																																																																																																																																																																																																																																																																																																										
1.015	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																																																										
1.016	-	-	100	0.091	0.091	0.091																																																																																																																																																																																																																																																																																																																																																																										
1.017	-	-	100	0.020	0.020	0.020																																																																																																																																																																																																																																																																																																																																																																										
3.000	-	-	100	0.031	0.031	0.031																																																																																																																																																																																																																																																																																																																																																																										
3.001	-	-	100	0.060	0.060	0.060																																																																																																																																																																																																																																																																																																																																																																										
3.002	-	-	100	0.055	0.055	0.055																																																																																																																																																																																																																																																																																																																																																																										
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1.018	-	-	100	0.034	0.034	0.034																																																																																																																																																																																																																																																																																																																																																																										
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7.001	-	-	100	0.037	0.037	0.037																																																																																																																																																																																																																																																																																																																																																																										
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5.007	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																																																										
10.000	-	-	100	0.032	0.032	0.032																																																																																																																																																																																																																																																																																																																																																																										
10.001	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																																																										
5.008	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																																																										
5.009	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																																																										
1.021	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																																																										
1.022	-	-	100	0.000	0.000	0.000																																																																																																																																																																																																																																																																																																																																																																										
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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
				Total	Total	Total
				1.672	1.672	1.672

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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S1.022		102.500	100.950	0.000	0	0
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Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: SW50, DS/PN: S1.021, Volume (m³): 4.2

Unit Reference	MD-SHE-0142-9900-1200-9900
Design Head (m)	1.200
Design Flow (l/s)	9.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	142
Invert Level (m)	106.200
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	9.9
Flush-Flo™	0.354	9.9
Kick-Flo®	0.774	8.1
Mean Flow over Head Range	-	8.6

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.1	1.200	9.9	3.000	15.3	7.000	22.9
0.200	9.4	1.400	10.6	3.500	16.4	7.500	23.7
0.300	9.8	1.600	11.3	4.000	17.5	8.000	24.4
0.400	9.9	1.800	12.0	4.500	18.5	8.500	25.2
0.500	9.7	2.000	12.6	5.000	19.5	9.000	25.9
0.600	9.4	2.200	13.2	5.500	20.4	9.500	26.5
0.800	8.2	2.400	13.7	6.000	21.3		
1.000	9.1	2.600	14.3	6.500	22.1		

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Storage Structures for Storm

Tank or Pond Manhole: SW50, DS/PN: S1.021

Invert Level (m) 106.200

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	727.0	1.600	1755.0

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.400
Region England and Wales Cv (Summer)	1.000		
M5-60 (mm)	20.000	Cv (Winter)	0.840
Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine Inertia	Status	OFF
DTS Status	OFF		

Profile(s) Summer and Winter

Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Climate Period Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow Overflow	Overflow Act.
S1.000	SW01	15 Summer	1 +0%	30/15 Summer			
S1.001	SW02	15 Summer	1 +0%	30/15 Summer	100/15 Summer		
S1.002	SW03	15 Summer	1 +0%	30/15 Summer	100/15 Summer		
S1.003	SW04	15 Summer	1 +0%	30/15 Summer	100/15 Summer		
S1.004	SW05	15 Summer	1 +0%	30/15 Summer			
S1.005	SW06	15 Summer	1 +0%	30/15 Summer	100/15 Summer		
S1.006	SW07	15 Summer	1 +0%	30/15 Summer			
S1.007	SW08	15 Summer	1 +0%	30/15 Summer	100/15 Summer		
S1.008	SW09	15 Summer	1 +0%	30/15 Summer	100/15 Summer		
S2.000	SW10	15 Summer	1 +0%	100/15 Summer			
S1.009	SW11	15 Summer	1 +0%	30/15 Summer			
S1.010	SW12	15 Summer	1 +0%	30/15 Summer			
S1.011	SW13	15 Summer	1 +0%	30/15 Summer			
S1.012	SW14	15 Summer	1 +0%	30/15 Summer			
S1.013	SW15	15 Summer	1 +0%	30/15 Summer			
S1.014	SW16	15 Summer	1 +0%	30/15 Summer			
S1.015	SW17	15 Summer	1 +0%				
S1.016	SW18	15 Summer	1 +0%	100/15 Summer			
S1.017	SW19	15 Summer	1 +0%	100/15 Summer			
S3.000	SW20	15 Summer	1 +0%	30/15 Summer	100/15 Summer		
S3.001	SW21	15 Summer	1 +0%	30/15 Summer			

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PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SW01	109.844	-0.106	0.000	0.19			3.0	OK	
S1.001	SW02	109.723	-0.097	0.000	0.27			5.5	OK	1
S1.002	SW03	109.508	-0.087	0.000	0.36			9.3	OK	2
S1.003	SW04	109.210	-0.040	0.000	0.87			13.5	OK	5
S1.004	SW05	108.975	-0.125	0.000	0.41			15.2	OK	
S1.005	SW06	108.816	-0.124	0.000	0.41			15.1	OK	4
S1.006	SW07	108.736	-0.104	0.000	0.55			20.4	OK	
S1.007	SW08	108.650	-0.090	0.000	0.66			23.1	OK	1
S1.008	SW09	108.498	-0.152	0.000	0.42			25.7	OK	2
S2.000	SW10	109.504	-0.101	0.000	0.23			7.4	OK	
S1.009	SW11	108.457	-0.123	0.000	0.63			38.3	OK	
S1.010	SW12	108.411	-0.104	0.000	0.70			40.9	OK	
S1.011	SW13	108.376	-0.089	0.000	0.83			44.3	OK	
S1.012	SW14	108.338	-0.097	0.000	0.79			46.7	OK	
S1.013	SW15	108.289	-0.096	0.000	0.80			49.0	OK	
S1.014	SW16	108.242	-0.083	0.000	0.87			52.9	OK	
S1.015	SW17	107.913	-0.347	0.000	0.12			53.0	OK	
S1.016	SW18	107.344	-0.246	0.000	0.42			61.7	OK	
S1.017	SW19	107.243	-0.232	0.000	0.47			62.8	OK	
S3.000	SW20	109.873	-0.167	0.000	0.15			5.4	OK	1
S3.001	SW21	109.794	-0.126	0.000	0.39			14.2	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.
S3.002	SW22	15 Summer	1	+0%	30/15 Summer			
S3.003	SW23	15 Summer	1	+0%	30/15 Summer			
S3.004	SW24	15 Summer	1	+0%	100/15 Summer			
S3.005	SW25	15 Summer	1	+0%				
S4.000	SW26	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
S4.001	SW27	15 Summer	1	+0%	100/15 Summer			
S1.018	SW28	15 Summer	1	+0%	100/15 Summer			
S1.019	SW29	30 Summer	1	+0%	100/15 Summer			
S1.020	SW30	30 Summer	1	+0%	100/60 Summer			
S5.000	HD31	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
S6.000	HD32	15 Summer	1	+0%	100/15 Summer			
S5.001	HD33	15 Summer	1	+0%	30/15 Summer			
S5.002	SW34	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
S5.003	SW35	15 Summer	1	+0%	30/15 Summer			
S7.000	SW36	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
S7.001	SW37	15 Summer	1	+0%	100/15 Summer			
S5.004	SW38	15 Summer	1	+0%	100/15 Summer			
S5.005	SW39	15 Summer	1	+0%	100/15 Summer			
S8.000	SW40	15 Summer	1	+0%	100/15 Summer	100/15 Summer		
S8.001	SW41	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
S9.000	SW42	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
S8.002	SW43	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
S5.006	SW44	15 Summer	1	+0%	30/15 Summer			
S5.007	SW45	15 Summer	1	+0%	30/15 Summer			
S10.000	SW46	15 Summer	1	+0%	100/15 Summer			
S10.001	SW47	15 Summer	1	+0%	30/15 Summer			
S5.008	SW48	15 Summer	1	+0%	30/15 Summer			
S5.009	SW49	15 Summer	1	+0%	30/15 Summer			
S1.021	SW50	480 Summer	1	+0%	1/15 Summer			
S1.022	SW51	480 Summer	1	+0%				

PN	US/MH Name	Water	Surcharged	Flooded	Half Drain		Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	
S3.002	SW22	109.721	-0.094	0.000	0.63		22.4	OK
S3.003	SW23	109.583	-0.147	0.000	0.51		31.5	OK
S3.004	SW24	109.473	-0.187	0.000	0.30		38.6	OK
S3.005	SW25	109.181	-0.219	0.000	0.16		45.6	OK
S4.000	SW26	108.093	-0.047	0.000	0.80		14.5	OK
S4.001	SW27	107.697	-0.133	0.000	0.34		20.6	OK
S1.018	SW28	107.063	-0.362	0.000	0.33		116.9	OK
S1.019	SW29	106.900	-0.400	0.000	0.24		116.9	OK
S1.020	SW30	106.646	-0.404	0.000	0.23		117.2	OK
S5.000	HD31	109.731	-0.134	0.000	0.33		12.7	OK
S6.000	HD32	109.754	-0.181	0.000	0.08		5.7	OK
S5.001	HD33	109.392	-0.108	0.000	0.53		19.2	OK

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)	
S5.002	SW34	109.319	-0.071	0.000	0.79			29.3	OK
S5.003	SW35	109.205	-0.065	0.000	0.85			29.4	OK
S7.000	SW36	109.524	-0.076	0.000	0.48			8.0	OK
S7.001	SW37	109.269	-0.141	0.000	0.29			13.5	OK
S5.004	SW38	109.024	-0.171	0.000	0.38			47.8	OK
S5.005	SW39	108.597	-0.188	0.000	0.29			54.2	OK
S8.000	SW40	109.051	-0.139	0.000	0.31			23.1	OK
S8.001	SW41	108.151	-0.189	0.000	0.29			31.1	OK
S9.000	SW42	109.321	-0.079	0.000	0.45			12.5	OK
S8.002	SW43	107.906	-0.134	0.000	0.59			44.0	OK
S5.006	SW44	107.756	-0.194	0.000	0.46			99.7	OK
S5.007	SW45	107.440	-0.210	0.000	0.40			100.0	OK
S10.000	SW46	107.796	-0.104	0.000	0.20			5.7	OK
S10.001	SW47	107.257	-0.103	0.000	0.21			5.6	OK
S5.008	SW48	106.904	-0.126	0.000	0.77			105.6	OK
S5.009	SW49	106.685	-0.190	0.000	0.49			105.2	OK
S1.021	SW50	106.508	0.158	0.000	0.54			9.8	SURCHARGED
S1.022	SW51	106.150	-0.100	0.000	0.24			9.8	OK

PN	US/MH Name	Level Exceeded
S3.002	SW22	
S3.003	SW23	
S3.004	SW24	
S3.005	SW25	
S4.000	SW26	3
S4.001	SW27	
S1.018	SW28	
S1.019	SW29	
S1.020	SW30	
S5.000	HD31	2
S6.000	HD32	
S5.001	HD33	
S5.002	SW34	2
S5.003	SW35	
S7.000	SW36	1
S7.001	SW37	
S5.004	SW38	
S5.005	SW39	
S8.000	SW40	2
S8.001	SW41	1
S9.000	SW42	3
S8.002	SW43	2
S5.006	SW44	
S5.007	SW45	

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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>																										
	<table><tr><td></td><td>US/MH</td><td>Level</td></tr><tr><td>PN</td><td>Name</td><td>Exceeded</td></tr><tr><td>S10.000</td><td>SW46</td><td></td></tr><tr><td>S10.001</td><td>SW47</td><td></td></tr><tr><td>S5.008</td><td>SW48</td><td></td></tr><tr><td>S5.009</td><td>SW49</td><td></td></tr><tr><td>S1.021</td><td>SW50</td><td></td></tr><tr><td>S1.022</td><td>SW51</td><td></td></tr></table>		US/MH	Level	PN	Name	Exceeded	S10.000	SW46		S10.001	SW47		S5.008	SW48		S5.009	SW49		S1.021	SW50		S1.022	SW51		
	US/MH	Level																								
PN	Name	Exceeded																								
S10.000	SW46																									
S10.001	SW47																									
S5.008	SW48																									
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S1.021	SW50																									
S1.022	SW51																									
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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 2.000

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 1

Number of Online Controls 1

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR

Ratio R 0.400

Region England and Wales Cv (Summer) 1.000

M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

DVD Status OFF

Analysis Timestep Fine

Inertia Status OFF

DTS Status OFF

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 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) SurchARGE	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SW01	15 Summer	30	+0%	30/15 Summer			
S1.001	SW02	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S1.002	SW03	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S1.003	SW04	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S1.004	SW05	15 Summer	30	+0%	30/15 Summer			
S1.005	SW06	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S1.006	SW07	15 Summer	30	+0%	30/15 Summer			
S1.007	SW08	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S1.008	SW09	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S2.000	SW10	15 Summer	30	+0%	100/15 Summer			
S1.009	SW11	15 Summer	30	+0%	30/15 Summer			
S1.010	SW12	15 Summer	30	+0%	30/15 Summer			
S1.011	SW13	15 Summer	30	+0%	30/15 Summer			
S1.012	SW14	15 Summer	30	+0%	30/15 Summer			
S1.013	SW15	15 Summer	30	+0%	30/15 Summer			
S1.014	SW16	15 Summer	30	+0%	30/15 Summer			
S1.015	SW17	15 Summer	30	+0%				
S1.016	SW18	15 Summer	30	+0%	100/15 Summer			
S1.017	SW19	15 Summer	30	+0%	100/15 Summer			
S3.000	SW20	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S3.001	SW21	15 Summer	30	+0%	30/15 Summer			

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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>											
<table><tr><td></td><td>US/MH</td><td>Level</td></tr><tr><td>PN</td><td>Name</td><td>Exceeded</td></tr><tr><td>S3.001</td><td>SW21</td><td></td></tr></table>				US/MH	Level	PN	Name	Exceeded	S3.001	SW21	
	US/MH	Level									
PN	Name	Exceeded									
S3.001	SW21										
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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.
S3.002	SW22	15 Summer	30	+0%	30/15 Summer			
S3.003	SW23	15 Summer	30	+0%	30/15 Summer			
S3.004	SW24	15 Summer	30	+0%	100/15 Summer			
S3.005	SW25	15 Summer	30	+0%				
S4.000	SW26	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S4.001	SW27	15 Summer	30	+0%	100/15 Summer			
S1.018	SW28	15 Summer	30	+0%	100/15 Summer			
S1.019	SW29	15 Summer	30	+0%	100/15 Summer			
S1.020	SW30	480 Summer	30	+0%	100/60 Summer			
S5.000	HD31	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S6.000	HD32	15 Summer	30	+0%	100/15 Summer			
S5.001	HD33	15 Summer	30	+0%	30/15 Summer			
S5.002	SW34	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S5.003	SW35	15 Summer	30	+0%	30/15 Summer			
S7.000	SW36	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S7.001	SW37	15 Summer	30	+0%	100/15 Summer			
S5.004	SW38	15 Summer	30	+0%	100/15 Summer			
S5.005	SW39	15 Summer	30	+0%	100/15 Summer			
S8.000	SW40	15 Summer	30	+0%	100/15 Summer	100/15 Summer		
S8.001	SW41	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S9.000	SW42	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S8.002	SW43	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
S5.006	SW44	15 Summer	30	+0%	30/15 Summer			
S5.007	SW45	15 Summer	30	+0%	30/15 Summer			
S10.000	SW46	15 Summer	30	+0%	100/15 Summer			
S10.001	SW47	15 Summer	30	+0%	30/15 Summer			
S5.008	SW48	15 Summer	30	+0%	30/15 Summer			
S5.009	SW49	15 Summer	30	+0%	30/15 Summer			
S1.021	SW50	480 Summer	30	+0%	1/15 Summer			
S1.022	SW51	1440 Summer	30	+0%				

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)	
S3.002	SW22	110.053	0.238	0.000	1.71			60.9	SURCHARGED
S3.003	SW23	109.796	0.066	0.000	1.42			87.7	SURCHARGED
S3.004	SW24	109.579	-0.081	0.000	0.86			109.4	OK
S3.005	SW25	109.247	-0.153	0.000	0.46			130.8	OK
S4.000	SW26	108.768	0.628	0.000	1.72			31.2	SURCHARGED
S4.001	SW27	107.760	-0.070	0.000	0.79			47.0	OK
S1.018	SW28	107.270	-0.155	0.000	0.87			308.7	OK
S1.019	SW29	107.055	-0.245	0.000	0.65			312.6	OK
S1.020	SW30	106.901	-0.149	0.000	0.13			65.5	OK
S5.000	HD31	110.057	0.192	0.000	0.70			27.0	SURCHARGED
S6.000	HD32	109.900	-0.035	0.000	0.21			13.8	OK
S5.001	HD33	109.878	0.378	0.000	1.16			42.1	SURCHARGED

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5 Manchester Square London W1U 3PD	Ratby Phase 2 Reserved Matters Submission SWS Drainage Results	
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Innovyze	Network 2020.1	

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

PN	US/MH Level	
	Name	Exceeded
S10.000	SW46	
S10.001	SW47	
S5.008	SW48	
S5.009	SW49	
S1.021	SW50	
S1.022	SW51	

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5 Manchester Square London W1U 3PD	Ratby Phase 2 Reserved Matters Submission SWS Drainage Results										
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Innovyze	Network 2020.1										
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>											
<table><tr><td></td><td>US/MH</td><td>Level</td></tr><tr><td>PN</td><td>Name</td><td>Exceeded</td></tr><tr><td>S3.001</td><td>SW21</td><td></td></tr></table>				US/MH	Level	PN	Name	Exceeded	S3.001	SW21	
	US/MH	Level									
PN	Name	Exceeded									
S3.001	SW21										
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5 Manchester Square London W1U 3PD	Ratby Phase 2 Reserved Matters Submission SWS Drainage Results	
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Innovyze	Network 2020.1	

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.
S3.002	SW22	15 Summer	100	+40%	30/15 Summer			
S3.003	SW23	15 Summer	100	+40%	30/15 Summer			
S3.004	SW24	15 Summer	100	+40%	100/15 Summer			
S3.005	SW25	15 Summer	100	+40%				
S4.000	SW26	15 Summer	100	+40%	30/15 Summer	100/15 Summer		
S4.001	SW27	15 Summer	100	+40%	100/15 Summer			
S1.018	SW28	15 Summer	100	+40%	100/15 Summer			
S1.019	SW29	960 Summer	100	+40%	100/15 Summer			
S1.020	SW30	960 Summer	100	+40%	100/60 Summer			
S5.000	HD31	15 Summer	100	+40%	30/15 Summer	100/15 Summer		
S6.000	HD32	15 Summer	100	+40%	100/15 Summer			
S5.001	HD33	15 Summer	100	+40%	30/15 Summer			
S5.002	SW34	15 Summer	100	+40%	30/15 Summer	100/15 Summer		
S5.003	SW35	15 Summer	100	+40%	30/15 Summer			
S7.000	SW36	15 Summer	100	+40%	30/15 Summer	100/15 Summer		
S7.001	SW37	15 Summer	100	+40%	100/15 Summer			
S5.004	SW38	15 Summer	100	+40%	100/15 Summer			
S5.005	SW39	15 Summer	100	+40%	100/15 Summer			
S8.000	SW40	15 Summer	100	+40%	100/15 Summer	100/15 Summer		
S8.001	SW41	15 Summer	100	+40%	30/15 Summer	100/15 Summer		
S9.000	SW42	15 Summer	100	+40%	30/15 Summer	100/15 Summer		
S8.002	SW43	15 Summer	100	+40%	30/15 Summer	100/15 Summer		
S5.006	SW44	15 Summer	100	+40%	30/15 Summer			
S5.007	SW45	15 Summer	100	+40%	30/15 Summer			
S10.000	SW46	15 Summer	100	+40%	100/15 Summer			
S10.001	SW47	15 Summer	100	+40%	30/15 Summer			
S5.008	SW48	30 Summer	100	+40%	30/15 Summer			
S5.009	SW49	960 Summer	100	+40%	30/15 Summer			
S1.021	SW50	960 Summer	100	+40%	1/15 Summer			
S1.022	SW51	960 Summer	100	+40%				

PN	US/MH Name	Water Level	Surcharged Depth	Flooded Volume	Flow / Overflow	Half Drain Time	Pipe Flow	Status
		(m)	(m)	(m³)	Cap. (l/s)	(mins)	(l/s)	
S3.002	SW22	110.970	1.155	0.000	2.74		97.8	SURCHARGED
S3.003	SW23	110.334	0.604	0.000	2.35		145.1	SURCHARGED
S3.004	SW24	109.939	0.279	0.000	1.43		182.9	SURCHARGED
S3.005	SW25	109.306	-0.094	0.000	0.78		220.9	OK
S4.000	SW26	109.344	1.204	4.484	2.21		40.2	FLOOD
S4.001	SW27	108.089	0.259	0.000	1.13		67.4	SURCHARGED
S1.018	SW28	107.603	0.178	0.000	1.46		519.0	SURCHARGED
S1.019	SW29	107.399	0.099	0.000	0.14		69.2	SURCHARGED
S1.020	SW30	107.398	0.348	0.000	0.13		67.3	SURCHARGED
S5.000	HD31	111.071	1.206	5.579	1.15		44.4	FLOOD
S6.000	HD32	111.095	1.160	0.000	0.34		23.0	FLOOD RISK
S5.001	HD33	111.031	1.531	0.000	1.58		57.6	FLOOD RISK

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5 Manchester Square London W1U 3PD	Ratby Phase 2 Reserved Matters Submission SWS Drainage Results	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S5.002	SW34	110.813	1.423	3.155	2.19		80.8	FLOOD
S5.003	SW35	110.477	1.207	0.000	2.33		80.7	FLOOD RISK
S7.000	SW36	110.800	1.200	0.240	1.67		27.9	FLOOD
S7.001	SW37	110.428	1.018	0.000	1.03		47.2	FLOOD RISK
S5.004	SW38	110.234	1.039	0.000	1.08		136.3	FLOOD RISK
S5.005	SW39	109.768	0.983	0.000	0.87		161.9	FLOOD RISK
S8.000	SW40	110.391	1.201	1.309	1.04		78.3	FLOOD
S8.001	SW41	109.550	1.210	0.193	0.98		106.9	FLOOD
S9.000	SW42	110.454	1.054	3.913	1.12		31.4	FLOOD
S8.002	SW43	109.243	1.203	3.013	1.74		130.7	FLOOD
S5.006	SW44	109.089	1.139	0.000	1.33		284.5	FLOOD RISK
S5.007	SW45	108.578	0.928	0.000	1.10		277.8	SURCHARGED
S10.000	SW46	108.234	0.334	0.000	0.82		22.9	SURCHARGED
S10.001	SW47	107.990	0.630	0.000	0.68		18.0	SURCHARGED
S5.008	SW48	107.839	0.809	0.000	2.13		290.9	FLOOD RISK
S5.009	SW49	107.398	0.523	0.000	0.22		46.7	SURCHARGED
S1.021	SW50	107.397	1.047	0.000	0.55		9.9	SURCHARGED
S1.022	SW51	106.150	-0.100	0.000	0.24		9.9	OK

PN	US/MH Name	Level Exceeded
S3.002	SW22	
S3.003	SW23	
S3.004	SW24	
S3.005	SW25	
S4.000	SW26	3
S4.001	SW27	
S1.018	SW28	
S1.019	SW29	
S1.020	SW30	
S5.000	HD31	2
S6.000	HD32	
S5.001	HD33	
S5.002	SW34	2
S5.003	SW35	
S7.000	SW36	1
S7.001	SW37	
S5.004	SW38	
S5.005	SW39	
S8.000	SW40	2
S8.001	SW41	1
S9.000	SW42	3
S8.002	SW43	2
S5.006	SW44	
S5.007	SW45	

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5 Manchester Square London W1U 3PD	Ratby Phase 2 Reserved Matters Submission SWS Drainage Results																									
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	US/MH	Level																								
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