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)	30	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.361	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

Network Design Table for Storm

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	12.421	0.146	85.1	0.042	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	25.643	0.302	85.0	0.019	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	10.210	0.175	58.3	0.020	5.00	0.0	0.600	o	100	Pipe/Conduit	
S2.001	9.393	0.231	40.7	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
S3.000	13.760	0.172	80.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
S3.001	5.358	0.286	18.7	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
S2.002	14.029	0.361	38.9	0.006	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	5.19	35.390	0.042	0.0	0.0	0.0	1.09	19.3	7.5
S1.001	50.00	5.58	35.169	0.061	0.0	0.0	0.0	1.09	19.3	11.0
S2.000	50.00	5.17	35.200	0.020	0.0	0.0	0.0	1.01	7.9	3.6
S2.001	50.00	5.27	34.300	0.033	0.0	0.0	0.0	1.58	28.0	6.0
S3.000	50.00	5.27	35.000	0.000	0.0	0.0	0.0	0.86	6.8	0.0
S3.001	50.00	5.32	34.828	0.000	0.0	0.0	0.0	1.79	14.1	0.0
S2.002	50.00	5.46	34.045	0.039	0.0	0.0	0.0	1.62	28.6	7.0

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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
S1.002	18.072	0.080	225.0	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	21.811	0.097	224.9	0.016	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	19.439	0.086	226.0	0.061	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	24.961	0.430	58.0	0.005	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.005	20.880	0.093	224.5	0.010	0.00	0.0	0.600	o	300	Pipe/Conduit	
S5.000	17.856	0.179	99.8	0.031	5.00	0.0	0.600	o	100	Pipe/Conduit	
S1.006	10.961	0.037	296.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.007	18.468	0.062	297.9	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.008	61.840	0.206	300.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.000	3.026	0.030	100.9	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit	
S6.001	4.958	0.062	80.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
S6.002	4.052	0.051	79.5	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.003	10.040	0.100	100.4	0.006	0.00	0.0	0.600	o	150	Pipe/Conduit	
S7.000	53.775#	0.003	17925.0	0.217	5.00	0.0	0.600	|_|	-1	Pipe/Conduit	
S7.001	0.944	2.492	0.4	0.000	0.00	0.0	0.600	o	125	Pipe/Conduit	
S7.002	17.514	0.175	100.1	0.000	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)
S1.002	50.00	5.87	33.534	0.157	0.0	0.0	0.0	1.04	73.8	28.3
S1.003	50.00	6.22	33.454	0.173	0.0	0.0	0.0	1.04	73.8	31.3
S1.004	50.00	6.53	33.357	0.234	0.0	0.0	0.0	1.04	73.6	42.2
S4.000	50.00	5.31	34.450	0.005	0.0	0.0	0.0	1.32	23.4	0.9
S1.005	50.00	6.86	33.271	0.248	0.0	0.0	0.0	1.05	73.9	44.8
S5.000	50.00	5.39	35.000	0.031	0.0	0.0	0.0	0.77	6.0	5.6
S1.006	50.00	7.06	33.178	0.279	0.0	0.0	0.0	0.91	64.2	50.4
S1.007	50.00	7.40	33.141	0.305	0.0	0.0	0.0	0.91	64.0	55.1
S1.008	50.00	8.55	33.079	0.305	0.0	0.0	0.0	0.90	63.8	55.1
S6.000	50.00	5.07	35.100	0.008	0.0	0.0	0.0	0.77	6.0	1.4
S6.001	50.00	5.16	34.780	0.008	0.0	0.0	0.0	0.86	6.8	1.4
S6.002	50.00	5.22	34.668	0.028	0.0	0.0	0.0	1.13	19.9	5.0
S6.003	50.00	5.39	34.390	0.034	0.0	0.0	0.0	1.00	17.7	6.2
S7.000	50.00	10.24	37.500	0.217	0.0	0.0	0.0	0.17	689.2	39.2
S7.001	50.00	10.24	37.497	0.217	0.0	0.0	0.0	14.68	180.1	39.2
S7.002	50.00	10.42	34.900	0.217	0.0	0.0	0.0	1.57	111.1	39.2

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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
S7.003	10.145	0.922	11.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S8.000	26.700#	0.003	8900.0	0.050	5.00	0.0	0.600	|_|	-3	Pipe/Conduit	
S8.001	0.527	1.757	0.3	0.000	0.00	0.0	0.600	o	75	Pipe/Conduit	
S8.002	16.613	0.166	100.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S8.003	10.322	0.981	10.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S7.004	3.898	0.049	79.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.009	9.393	0.080	117.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S9.000	8.727	0.150	58.0	0.009	5.00	0.0	0.600	o	150	Pipe/Conduit	
S9.001	5.196	0.023	225.0	0.005	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.002	11.765	0.052	226.3	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.003	5.181	0.023	225.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.004	17.948	0.080	225.0	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.005	29.633	0.132	225.0	0.024	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.006	12.276	0.055	223.2	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.007	12.437	0.055	226.1	0.018	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.008	7.307	0.731	10.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.010	9.246	0.041	225.5	0.000	0.00	0.0	0.600	o	450	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)
S7.003	50.00	10.46	34.725	0.217	0.0	0.0	0.0	4.77	336.9	39.2
S8.000	50.00	6.83	37.850	0.050	0.0	0.0	0.0	0.24	317.5	9.0
S8.001	50.00	6.83	37.500	0.050	0.0	0.0	0.0	11.79	52.1	9.0
S8.002	50.00	7.11	34.900	0.050	0.0	0.0	0.0	1.00	17.7	9.0
S8.003	50.00	7.16	34.734	0.050	0.0	0.0	0.0	3.12	55.2	9.0
S7.004	50.00	10.50	33.400	0.267	0.0	0.0	0.0	1.76	124.7	48.2
S1.009	50.00	10.58	32.200	0.606	0.0	0.0	0.0	1.88	298.3	109.5
S9.000	50.00	5.11	33.780	0.009	0.0	0.0	0.0	1.32	23.4	1.7
S9.001	50.00	5.21	33.500	0.014	0.0	0.0	0.0	0.87	34.5	2.6
S9.002	50.00	5.44	33.477	0.041	0.0	0.0	0.0	0.87	34.4	7.5
S9.003	50.00	5.54	33.425	0.041	0.0	0.0	0.0	0.87	34.5	7.5
S9.004	50.00	5.88	33.402	0.077	0.0	0.0	0.0	0.87	34.5	13.8
S9.005	50.00	6.45	33.322	0.101	0.0	0.0	0.0	0.87	34.5	18.2
S9.006	50.00	6.68	33.190	0.122	0.0	0.0	0.0	0.87	34.6	22.0
S9.007	50.00	6.92	33.135	0.139	0.0	0.0	0.0	0.87	34.4	25.2
S9.008	50.00	6.95	33.005	0.139	0.0	0.0	0.0	5.00	353.5	25.2
S1.010	50.00	10.69	32.120	0.746	0.0	0.0	0.0	1.35	214.7	134.6

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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
S10.000	7.029	0.141	49.9	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
S11.000	11.052	0.728	15.2	0.030	5.00	0.0	0.600	o	150	Pipe/Conduit	
S10.001	8.132	0.081	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S12.000	5.767	0.072	80.1	0.011	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.011	9.327	0.518	18.0	0.021	0.00	0.0	0.600	o	300	Pipe/Conduit	
S13.000	11.379	0.195	58.4	0.020	5.00	0.0	0.600	o	100	Pipe/Conduit	
S13.001	4.014	0.069	58.2	0.040	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.002	6.227	0.072	86.5	0.030	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.003	13.273	0.162	81.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.004	2.883	0.036	80.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.005	5.305	0.066	80.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.006	2.507	0.125	20.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.007	6.604	0.066	100.1	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.008	14.487	0.145	99.9	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	
S13.009	7.507	0.335	22.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S13.010	10.035	1.004	10.0	0.000	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)
S10.000	50.00	5.11	33.780	0.000	0.0	0.0	0.0	1.09	8.6	0.0
S11.000	50.00	5.07	34.340	0.030	0.0	0.0	0.0	2.60	45.9	5.4
S10.001	50.00	5.24	33.580	0.030	0.0	0.0	0.0	1.00	17.8	5.4
S12.000	50.00	5.09	34.570	0.011	0.0	0.0	0.0	1.12	19.9	1.9
S1.011	50.00	10.74	32.079	0.807	0.0	0.0	0.0	3.72	263.2	145.7
S13.000	50.00	5.19	36.190	0.020	0.0	0.0	0.0	1.01	7.9	3.6
S13.001	50.00	5.24	35.340	0.060	0.0	0.0	0.0	1.32	23.3	10.8
S13.002	50.00	5.33	34.530	0.090	0.0	0.0	0.0	1.08	19.1	16.2
S13.003	50.00	5.53	34.458	0.090	0.0	0.0	0.0	1.11	19.6	16.2
S13.004	50.00	5.58	34.296	0.090	0.0	0.0	0.0	1.12	19.9	16.2
S13.005	50.00	5.65	34.260	0.090	0.0	0.0	0.0	1.12	19.8	16.2
S13.006	50.00	5.67	34.194	0.090	0.0	0.0	0.0	2.26	39.9	16.2
S13.007	50.00	5.76	33.530	0.120	0.0	0.0	0.0	1.31	52.0	21.7
S13.008	50.00	5.91	33.330	0.150	0.0	0.0	0.0	1.57	111.2	27.1
S13.009	50.00	5.95	33.180	0.150	0.0	0.0	0.0	3.34	235.8	27.1
S13.010	50.00	5.98	32.845	0.150	0.0	0.0	0.0	5.00	353.5	27.1

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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
S1.012	8.199	0.205	40.0	0.000	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)
S1.012	50.00	10.78	31.486	0.957	0.0	0.0	0.0	2.87	317.3	172.8

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.023	0.023	0.023
	User	-	100	0.019	0.019	0.042
1.001	User	-	100	0.019	0.019	0.019
2.000	-	-	100	0.020	0.020	0.020
2.001	User	-	100	0.006	0.006	0.006
	User	-	100	0.007	0.007	0.013
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.000	0.000	0.000
2.002	User	-	100	0.006	0.006	0.006
1.002	User	-	100	0.025	0.025	0.025
	User	-	100	0.004	0.004	0.029
	User	-	100	0.008	0.008	0.037
	User	-	100	0.006	0.006	0.043
	User	-	100	0.008	0.008	0.051
	User	-	100	0.006	0.006	0.057
1.003	User	-	100	0.016	0.016	0.016
1.004	User	-	100	0.022	0.022	0.022
	User	-	100	0.021	0.021	0.044
	User	-	100	0.017	0.017	0.061
4.000	User	-	100	0.005	0.005	0.005
1.005	User	-	100	0.010	0.010	0.010
5.000	-	-	100	0.031	0.031	0.031
1.006	-	-	100	0.000	0.000	0.000
1.007	User	-	100	0.026	0.026	0.026
1.008	-	-	100	0.000	0.000	0.000
6.000	-	-	100	0.008	0.008	0.008
6.001	-	-	100	0.000	0.000	0.000
6.002	User	-	100	0.016	0.016	0.016
	User	-	100	0.004	0.004	0.020
6.003	User	-	100	0.006	0.006	0.006
7.000	-	-	100	0.217	0.217	0.217
7.001	-	-	100	0.000	0.000	0.000
7.002	-	-	100	0.000	0.000	0.000
7.003	-	-	100	0.000	0.000	0.000
8.000	-	-	100	0.050	0.050	0.050
8.001	-	-	100	0.000	0.000	0.000
8.002	-	-	100	0.000	0.000	0.000
8.003	-	-	100	0.000	0.000	0.000
7.004	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
9.000	User	-	100	0.009	0.009	0.009
9.001	User	-	100	0.005	0.005	0.005
9.002	User	-	100	0.027	0.027	0.027
9.003	-	-	100	0.000	0.000	0.000
9.004	User	-	100	0.013	0.013	0.013
	User	-	100	0.022	0.022	0.035
9.005	User	-	100	0.024	0.024	0.024
9.006	User	-	100	0.021	0.021	0.021
9.007	User	-	100	0.018	0.018	0.018
9.008	-	-	100	0.000	0.000	0.000
1.010	-	-	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)
10.000	-	-	100	0.000	0.000	0.000
11.000	User	-	100	0.030	0.030	0.030
10.001	-	-	100	0.000	0.000	0.000
12.000	User	-	100	0.011	0.011	0.011
1.011	User	-	100	0.021	0.021	0.021
13.000	-	-	100	0.020	0.020	0.020
13.001	-	-	100	0.040	0.040	0.040
13.002	-	-	100	0.030	0.030	0.030
13.003	-	-	100	0.000	0.000	0.000
13.004	-	-	100	0.000	0.000	0.000
13.005	-	-	100	0.000	0.000	0.000
13.006	-	-	100	0.000	0.000	0.000
13.007	-	-	100	0.030	0.030	0.030
13.008	-	-	100	0.030	0.030	0.030
13.009	-	-	100	0.000	0.000	0.000
13.010	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.957	0.957	0.957

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)
S1.012	S	35.260	31.281	30.945	700	570

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 Coeffiecient	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	5
Number of Online Controls	5	Number of Time/Area Diagrams	0
Number of Offline Controls	2	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.361		

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Online Controls for Storm

Non Return Valve Manhole: S14, DS/PN: S3.001, Volume (m³): 0.3

Siphon Manhole: S-Siphonic RWP, DS/PN: S7.001, Volume (m³): 216.6

Invert Level (m) 37.497 Cut In Height (m) 0.025 Cut Out Height (m) 0.025

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.025	39.0000	0.100	39.0000	0.150	39.0000

Siphon Manhole: Ssipone downpie, DS/PN: S8.001, Volume (m³): 34.9

Invert Level (m) 37.500 Cut In Height (m) 0.025 Cut Out Height (m) 0.025

Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)	Depth (m)	Outflow (l/s)
0.025	9.0000	0.100	9.0000	0.150	9.0000

Non Return Valve Manhole: S16, DS/PN: S9.001, Volume (m³): 0.5

Complex Manhole: S10, DS/PN: S1.011, Volume (m³): 13.7

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0263-4300-2000-4300
Design Head (m)	2.000
Design Flow (l/s)	43.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	263
Invert Level (m)	32.079
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	43.0
Flush-Flo™	0.596	43.0
Kick-Flo®	1.304	35.0
Mean Flow over Head Range	-	37.1

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

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Hydro-Brake® Optimum

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.4	1.200	38.0	3.000	52.3	7.000	78.8
0.200	27.0	1.400	36.2	3.500	56.3	7.500	81.5
0.300	39.8	1.600	38.6	4.000	60.1	8.000	84.1
0.400	41.8	1.800	40.9	4.500	63.6	8.500	86.6
0.500	42.7	2.000	43.0	5.000	66.9	9.000	89.1
0.600	43.0	2.200	45.0	5.500	70.1	9.500	91.4
0.800	42.4	2.400	46.9	6.000	73.1		
1.000	41.0	2.600	48.8	6.500	76.0		

Orifice

Diameter (m) 0.140 Discharge Coefficient 0.600 Invert Level (m) 32.979

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Offline Controls for Storm

Depth/Flow Relationship Manhole: S-Siphonic RWP, DS/PN: S7.001, Loop to PN: S7.002

Invert Level (m) 37.497

Depth (m)	Flow (l/s)
0.025	0.5000

Depth/Flow Relationship Manhole: Ssipone downpie, DS/PN: S8.001, Loop to PN: S8.002

Invert Level (m) 37.600

Depth (m)	Flow (l/s)
0.025	0.5000

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Storage Structures for Storm

Infiltration Trench Manhole: S18, DS/PN: S9.004

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.3
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	17.9
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.30	Cap Volume Depth (m)	1.265
Invert Level (m)	33.402	Cap Infiltration Depth (m)	0.000

Infiltration Trench Manhole: Sjunction, DS/PN: S9.005

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.3
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	29.6
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.30	Cap Volume Depth (m)	1.490
Invert Level (m)	33.322	Cap Infiltration Depth (m)	0.000

Infiltration Trench Manhole: Sjunction, DS/PN: S9.006

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.3
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	12.3
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.30	Cap Volume Depth (m)	1.820
Invert Level (m)	33.190	Cap Infiltration Depth (m)	0.000

Infiltration Trench Manhole: S19a, DS/PN: S9.007

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.3
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	12.4
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.30	Cap Volume Depth (m)	2.604
Invert Level (m)	33.136	Cap Infiltration Depth (m)	0.000

Cellular Storage Manhole: Stank, DS/PN: S1.010

Invert Level (m)	32.120	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.96
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	115.0	0.0	1.551	0.0	0.0
1.550	115.0	0.0			

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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 Coeffiecient	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	5
Number of Online Controls	5	Number of Time/Area Diagrams	0
Number of Offline Controls	2	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.361
Region	England and Wales	Cv (Summer)	0.740
M5-60 (mm)	18.000	Cv (Winter)	0.850

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
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
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1a	15 Winter	1	+0%					35.445
S1.001	S1	15 Winter	1	+0%					35.234
S2.000	Srwp	15 Winter	1	+0%					35.240
S2.001	S11	15 Winter	1	+0%					34.339
S3.000	S13	120 Winter	1	+0%					35.000
S3.001	S14	120 Winter	1	+0%					34.828
S2.002	S12	15 Winter	1	+0%					34.086
S1.002	S2	15 Winter	1	+0%	30/15 Summer				33.641
S1.003	S3	15 Winter	1	+0%	30/15 Summer				33.564
S1.004	S4	15 Winter	1	+0%	30/15 Summer				33.486
S4.000	Sre	15 Winter	1	+0%					34.466
S1.005	S5	15 Winter	1	+0%	30/15 Summer				33.402
S5.000	Srwp	15 Winter	1	+0%	30/15 Summer				35.059
S1.006	S6	15 Winter	1	+0%	30/15 Summer				33.340
S1.007	S7	15 Winter	1	+0%	30/15 Summer				33.302
S1.008	S8	15 Winter	1	+0%	30/15 Summer				33.231
S6.000	Srwp	15 Winter	1	+0%					35.131
S6.001	S21	15 Winter	1	+0%					34.807

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1a	-0.095	0.000	0.29		5.1	OK	
S1.001	S1	-0.085	0.000	0.38		7.1	OK	
S2.000	Srwp	-0.060	0.000	0.33		2.4	OK	
S2.001	S11	-0.111	0.000	0.15		3.8	OK	
S3.000	S13	-0.100	0.000	0.00		0.0	OK	
S3.001	S14	-0.100	0.000	0.00		0.0	OK	
S2.002	S12	-0.109	0.000	0.17		4.3	OK	
S1.002	S2	-0.193	0.000	0.27		17.3	OK	
S1.003	S3	-0.190	0.000	0.29		18.7	OK	
S1.004	S4	-0.170	0.000	0.38		24.6	OK	
S4.000	Sre	-0.134	0.000	0.03		0.6	OK	
S1.005	S5	-0.169	0.000	0.40		25.7	OK	
S5.000	Srwp	-0.041	0.000	0.64		3.7	OK	
S1.006	S6	-0.138	0.000	0.56		28.7	OK	
S1.007	S7	-0.138	0.000	0.56		31.0	OK	
S1.008	S8	-0.148	0.000	0.50		30.6	OK	
S6.000	Srwp	-0.069	0.000	0.20		1.0	OK	
S6.001	S21	-0.073	0.000	0.16		1.0	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
S6.002	S18a	15 Winter	1	+0%		
S6.003	S22	15 Winter	1	+0%		
S7.000	S-Siphonic Gutter	240 Winter	1	+0%		
S7.001	S-Siphonic RWP	600 Summer	1	+0%		
S7.002	S-Siphonic Connection	360 Winter	1	+0%		
S7.003	Sgravity change slope	360 Winter	1	+0%		
S8.000	Sgutter	15 Winter	1	+0%		
S8.001	Ssipone downpie	1440 Winter	1	+0%	30/15 Summer	
S8.002	Sgravity	15 Winter	1	+0%		
S8.003	Sgravity changed slope	15 Winter	1	+0%		
S7.004	S26	15 Winter	1	+0%		
S1.009	S9	15 Winter	1	+0%	30/15 Winter	
S9.000	S channel	15 Winter	1	+0%		
S9.001	S16	15 Winter	1	+0%		
S9.002	Sjunction	15 Winter	1	+0%		
S9.003	S17	15 Winter	1	+0%		
S9.004	S18	15 Winter	1	+0%		
S9.005	Sjunction	15 Winter	1	+0%		
S9.006	Sjunction	15 Winter	1	+0%	30/15 Summer	
S9.007	S19a	15 Winter	1	+0%	30/15 Winter	
S9.008	S19	15 Winter	1	+0%		
S1.010	Stank	30 Winter	1	+0%	30/30 Summer	
S10.000	S24	120 Winter	1	+0%		
S11.000	Schannel	15 Winter	1	+0%		
S10.001	S25	15 Winter	1	+0%		
S12.000	S23	15 Winter	1	+0%		
S1.011	S10	30 Winter	1	+0%	30/15 Summer	
S13.000	Sex18	15 Winter	1	+0%		
S13.001	Sex17	15 Winter	1	+0%	30/15 Summer	
S13.002	Sex16	15 Winter	1	+0%	30/15 Summer	
S13.003	Scw01	15 Winter	1	+0%	30/15 Summer	
S13.004	Scw02	15 Winter	1	+0%	30/15 Summer	
S13.005	Scw3	15 Winter	1	+0%	30/15 Summer	
S13.006	Scw04	15 Winter	1	+0%	30/15 Summer	
S13.007	Scw05	15 Winter	1	+0%		
S13.008	Scw06	15 Winter	1	+0%		
S13.009	Scw07	15 Winter	1	+0%		
S13.010	Scw08	15 Winter	1	+0%		
S1.012	SCW09	30 Winter	1	+0%		

PN	US/MH Name	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.
S6.002	S18a			34.715	-0.103	0.000	0.21
S6.003	S22			34.439	-0.101	0.000	0.23
S7.000	S-Siphonic Gutter			37.522	-0.128	0.000	0.00

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

PN	US/MH Name	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S7.001	S-Siphonic RWP	1/15 Summer	48	37.522	-0.100	0.000	0.02
S7.002	S-Siphonic Connection			34.940	-0.260	0.000	0.03
S7.003	Sgravity change slope			34.746	-0.279	0.000	0.01
S8.000	Sgutter			37.858	-0.142	0.000	0.01
S8.001	Ssipone downpie	30/15 Summer	5	37.525	-0.050	0.000	0.02
S8.002	Sgravity			34.961	-0.089	0.000	0.35
S8.003	Sgravity changed slope			34.767	-0.117	0.000	0.11
S7.004	S26			33.464	-0.236	0.000	0.10
S1.009	S9			32.343	-0.307	0.000	0.22
S9.000	S channel			33.803	-0.127	0.000	0.05
S9.001	S16			33.543	-0.182	0.000	0.06
S9.002	Sjunction			33.533	-0.169	0.000	0.14
S9.003	S17			33.493	-0.157	0.000	0.18
S9.004	S18			33.479	-0.148	0.000	0.26
S9.005	Sjunction			33.406	-0.141	0.000	0.30
S9.006	Sjunction			33.284	-0.131	0.000	0.36
S9.007	S19a			33.243	-0.118	0.000	0.46
S9.008	S19			33.054	-0.251	0.000	0.06
S1.010	Stank			32.298	-0.272	0.000	0.19
S10.000	S24			33.780	-0.100	0.000	0.00
S11.000	Schannel			34.370	-0.120	0.000	0.09
S10.001	S25			33.629	-0.101	0.000	0.23
S12.000	S23			34.598	-0.122	0.000	0.08
S1.011	S10			32.288	-0.091	0.000	0.16
S13.000	Sex18			36.230	-0.060	0.000	0.32
S13.001	Sex17			35.406	-0.084	0.000	0.40
S13.002	Sex16			34.615	-0.065	0.000	0.60
S13.003	Scw01			34.537	-0.071	0.000	0.54
S13.004	Scw02			34.399	-0.047	0.000	0.81
S13.005	Scw3			34.344	-0.066	0.000	0.60
S13.006	Scw04			34.263	-0.081	0.000	0.43
S13.007	Scw05			33.622	-0.133	0.000	0.35
S13.008	Scw06			33.413	-0.217	0.000	0.17
S13.009	Scw07			33.245	-0.235	0.000	0.11
S13.010	Scw08			32.893	-0.252	0.000	0.06
S1.012	SCW09			31.599	-0.261	0.000	0.20

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S6.002	S18a		3.0	OK	
S6.003	S22		3.7	OK	
S7.000	S-Siphonic Gutter		5.8	OK	
S7.001	S-Siphonic RWP	0.5	1.3	OK*	
S7.002	S-Siphonic Connection		3.0	OK*	
S7.003	Sgravity change slope		3.1	OK*	

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

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S8.000	Sgutter		6.0	FLOOD RISK	
S8.001	Ssipone downpie	0.0	0.4	OK*	
S8.002	Sgravity		6.1	OK*	
S8.003	Sgravity changed slope		6.1	OK*	
S7.004	S26		6.2	OK	
S1.009	S9		37.4	OK	
S9.000	S channel		1.1	OK	
S9.001	S16		1.6	OK	
S9.002	Sjunction		4.4	OK*	
S9.003	S17		4.4	OK	
S9.004	S18		7.9	OK	
S9.005	Sjunction		10.2	OK*	
S9.006	Sjunction		12.0	OK*	
S9.007	S19a		13.6	OK	
S9.008	S19		13.6	OK	
S1.010	Stank		27.3	OK	
S10.000	S24		0.0	OK	
S11.000	Schannel		3.6	OK	
S10.001	S25		3.6	OK	
S12.000	S23		1.3	OK	
S1.011	S10		28.8	OK	
S13.000	Sex18		2.4	OK	
S13.001	Sex17		6.5	OK	
S13.002	Sex16		9.7	OK	
S13.003	Scw01		9.7	OK	
S13.004	Scw02		9.7	OK	
S13.005	Scw3		9.6	OK	
S13.006	Scw04		9.6	OK	
S13.007	Scw05		12.5	OK	
S13.008	Scw06		15.4	OK	
S13.009	Scw07		15.5	OK	
S13.010	Scw08		15.5	OK	
S1.012	SCW09		35.7	OK	

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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 Coeffiecient	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	5
Number of Online Controls	5	Number of Time/Area Diagrams	0
Number of Offline Controls	2	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.361
Region	England and Wales	Cv (Summer)	0.740
M5-60 (mm)	18.000	Cv (Winter)	0.850

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
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
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1a	15 Winter	30	+0%					35.485
S1.001	S1	15 Winter	30	+0%					35.302
S2.000	Srwp	15 Winter	30	+0%					35.269
S2.001	S11	15 Winter	30	+0%					34.367
S3.000	S13	120 Winter	30	+0%					35.000
S3.001	S14	120 Winter	30	+0%					34.828
S2.002	S12	15 Winter	30	+0%					34.116
S1.002	S2	15 Winter	30	+0%	30/15 Summer				33.963
S1.003	S3	15 Winter	30	+0%	30/15 Summer				33.872
S1.004	S4	15 Winter	30	+0%	30/15 Summer				33.784
S4.000	Sre	15 Winter	30	+0%					34.475
S1.005	S5	15 Winter	30	+0%	30/15 Summer				33.701
S5.000	Srwp	15 Winter	30	+0%	30/15 Summer				35.377
S1.006	S6	15 Winter	30	+0%	30/15 Summer				33.615
S1.007	S7	15 Winter	30	+0%	30/15 Summer				33.549
S1.008	S8	15 Winter	30	+0%	30/15 Summer				33.447
S6.000	Srwp	15 Winter	30	+0%					35.150
S6.001	S21	15 Winter	30	+0%					34.824

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1a	-0.055	0.000	0.71		12.5	OK	
S1.001	S1	-0.017	0.000	0.99		18.2	OK	
S2.000	Srwp	-0.031	0.000	0.81		6.0	OK	
S2.001	S11	-0.083	0.000	0.41		10.1	OK	
S3.000	S13	-0.100	0.000	0.00		0.0	OK	
S3.001	S14	-0.100	0.000	0.00		0.0	OK	
S2.002	S12	-0.079	0.000	0.45		11.8	OK	
S1.002	S2	0.129	0.000	0.73		46.5	SURCHARGED	
S1.003	S3	0.118	0.000	0.69		44.7	SURCHARGED	
S1.004	S4	0.127	0.000	0.89		56.6	SURCHARGED	
S4.000	Sre	-0.125	0.000	0.06		1.4	OK	
S1.005	S5	0.130	0.000	0.93		60.1	SURCHARGED	
S5.000	Srwp	0.277	0.000	1.58		9.2	SURCHARGED	
S1.006	S6	0.137	0.000	1.33		68.0	SURCHARGED	
S1.007	S7	0.109	0.000	1.28		71.0	SURCHARGED	
S1.008	S8	0.068	0.000	1.17		71.3	SURCHARGED	
S6.000	Srwp	-0.050	0.000	0.50		2.4	OK	
S6.001	S21	-0.056	0.000	0.40		2.4	OK	

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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
S6.002	S18a	15 Winter	30	+0%		
S6.003	S22	15 Winter	30	+0%		
S7.000	S-Siphonic Gutter	30 Winter	30	+0%		
S7.001	S-Siphonic RWP	30 Winter	30	+0%		
S7.002	S-Siphonic Connection	60 Summer	30	+0%		
S7.003	Sgravity change slope	60 Winter	30	+0%		
S8.000	Sgutter	15 Winter	30	+0%		
S8.001	Ssipone downpie	15 Winter	30	+0%	30/15 Summer	
S8.002	Sgravity	15 Summer	30	+0%		
S8.003	Sgravity changed slope	15 Winter	30	+0%		
S7.004	S26	30 Winter	30	+0%		
S1.009	S9	60 Winter	30	+0%	30/15 Winter	
S9.000	S channel	15 Winter	30	+0%		
S9.001	S16	15 Winter	30	+0%		
S9.002	Sjunction	15 Winter	30	+0%		
S9.003	S17	15 Winter	30	+0%		
S9.004	S18	15 Winter	30	+0%		
S9.005	Sjunction	15 Winter	30	+0%		
S9.006	Sjunction	15 Winter	30	+0%	30/15 Summer	
S9.007	S19a	15 Winter	30	+0%	30/15 Winter	
S9.008	S19	15 Winter	30	+0%		
S1.010	Stank	60 Winter	30	+0%	30/30 Summer	
S10.000	S24	120 Winter	30	+0%		
S11.000	Schannel	15 Winter	30	+0%		
S10.001	S25	15 Winter	30	+0%		
S12.000	S23	15 Winter	30	+0%		
S1.011	S10	60 Winter	30	+0%	30/15 Summer	
S13.000	Sex18	15 Winter	30	+0%		
S13.001	Sex17	15 Winter	30	+0%	30/15 Summer	
S13.002	Sex16	15 Winter	30	+0%	30/15 Summer	
S13.003	Scw01	15 Winter	30	+0%	30/15 Summer	
S13.004	Scw02	15 Winter	30	+0%	30/15 Summer	
S13.005	Scw3	15 Winter	30	+0%	30/15 Summer	
S13.006	Scw04	15 Winter	30	+0%	30/15 Summer	
S13.007	Scw05	15 Winter	30	+0%		
S13.008	Scw06	15 Winter	30	+0%		
S13.009	Scw07	15 Winter	30	+0%		
S13.010	Scw08	15 Winter	30	+0%		
S1.012	SCW09	30 Winter	30	+0%		

PN	US/MH Name	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.
S6.002	S18a			34.754	-0.064	0.000	0.62
S6.003	S22			34.481	-0.059	0.000	0.68
S7.000	S-Siphonic Gutter			37.535	-0.115	0.000	0.02

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

PN	US/MH Name	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S7.001	S-Siphonic RWP	1/15 Summer	48	37.523	-0.099	0.000	0.57
S7.002	S-Siphonic Connection			35.030	-0.170	0.000	0.35
S7.003	Sgravity change slope			34.808	-0.217	0.000	0.15
S8.000	Sgutter			37.865	-0.135	0.000	0.02
S8.001	Ssipone downpie	30/15 Summer	5	37.815	0.240	0.000	0.43
S8.002	Sgravity			34.978	-0.072	0.000	0.54
S8.003	Sgravity changed slope			34.776	-0.108	0.000	0.17
S7.004	S26			33.608	-0.092	0.000	0.80
S1.009	S9			32.867	0.217	0.000	0.55
S9.000	S channel			33.817	-0.113	0.000	0.13
S9.001	S16			33.592	-0.133	0.000	0.17
S9.002	Sjunction			33.588	-0.114	0.000	0.40
S9.003	S17			33.562	-0.088	0.000	0.49
S9.004	S18			33.555	-0.072	0.000	0.73
S9.005	Sjunction			33.518	-0.029	0.000	0.78
S9.006	Sjunction			33.447	0.032	0.000	0.90
S9.007	S19a			33.367	0.007	0.000	1.13
S9.008	S19			33.084	-0.221	0.000	0.16
S1.010	Stank			32.768	0.198	0.000	0.28
S10.000	S24			33.780	-0.100	0.000	0.00
S11.000	Schannel			34.387	-0.103	0.000	0.21
S10.001	S25			33.662	-0.068	0.000	0.57
S12.000	S23			34.615	-0.105	0.000	0.19
S1.011	S10			32.746	0.367	0.000	0.24
S13.000	Sex18			36.259	-0.031	0.000	0.79
S13.001	Sex17			35.505	0.015	0.000	1.11
S13.002	Sex16			35.091	0.411	0.000	1.55
S13.003	Scw01			34.929	0.321	0.000	1.32
S13.004	Scw02			34.644	0.198	0.000	2.00
S13.005	Scw3			34.499	0.089	0.000	1.48
S13.006	Scw04			34.356	0.012	0.000	1.07
S13.007	Scw05			33.690	-0.065	0.000	0.83
S13.008	Scw06			33.467	-0.163	0.000	0.41
S13.009	Scw07			33.285	-0.195	0.000	0.26
S13.010	Scw08			32.923	-0.222	0.000	0.15
S1.012	SCW09			31.652	-0.208	0.000	0.41

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S6.002	S18a		8.7	OK	
S6.003	S22		10.7	OK	
S7.000	S-Siphonic Gutter		49.4	OK	
S7.001	S-Siphonic RWP	0.5	39.0	OK*	
S7.002	S-Siphonic Connection		36.5	OK*	
S7.003	Sgravity change slope		35.2	OK*	

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

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S8.000	Sgutter		14.8	FLOOD RISK	
S8.001	Ssipone downpie	0.5	9.0	FLOOD RISK*	
S8.002	Sgravity		9.5	OK*	
S8.003	Sgravity changed slope		9.5	OK*	
S7.004	S26		49.0	OK	
S1.009	S9		93.5	SURCHARGED	
S9.000	S channel		2.7	OK	
S9.001	S16		4.3	OK	
S9.002	Sjunction		12.8	OK*	
S9.003	S17		12.4	OK	
S9.004	S18		22.7	OK	
S9.005	Sjunction		26.8	OK*	
S9.006	Sjunction		29.8	SURCHARGED*	
S9.007	S19a		33.5	SURCHARGED	
S9.008	S19		33.3	OK	
S1.010	Stank		40.9	SURCHARGED	
S10.000	S24		0.0	OK	
S11.000	Schannel		8.9	OK	
S10.001	S25		8.8	OK	
S12.000	S23		3.2	OK	
S1.011	S10		43.0	SURCHARGED	
S13.000	Sex18		5.9	OK	
S13.001	Sex17		18.3	SURCHARGED*	
S13.002	Sex16		24.8	SURCHARGED*	
S13.003	Scw01		23.7	SURCHARGED*	
S13.004	Scw02		23.8	SURCHARGED*	
S13.005	Scw3		23.8	SURCHARGED	
S13.006	Scw04		23.6	SURCHARGED	
S13.007	Scw05		29.9	OK	
S13.008	Scw06		38.3	OK	
S13.009	Scw07		38.4	OK	
S13.010	Scw08		38.4	OK	
S1.012	SCW09		72.7	OK	

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Surcharged Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.012	S	35.260	31.281	30.945	700	570

Datum (m) 30.945 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	1.700	11	1.700	21	1.700	31	1.700	41	1.700	51	1.700
2	1.700	12	1.700	22	1.700	32	1.700	42	1.700	52	1.700
3	1.700	13	1.700	23	1.700	33	1.700	43	1.700	53	1.700
4	1.700	14	1.700	24	1.700	34	1.700	44	1.700	54	1.700
5	1.700	15	1.700	25	1.700	35	1.700	45	1.700	55	1.700
6	1.700	16	1.700	26	1.700	36	1.700	46	1.700	56	1.700
7	1.700	17	1.700	27	1.700	37	1.700	47	1.700	57	1.700
8	1.700	18	1.700	28	1.700	38	1.700	48	1.700	58	1.700
9	1.700	19	1.700	29	1.700	39	1.700	49	1.700	59	1.700
10	1.700	20	1.700	30	1.700	40	1.700	50	1.700	60	1.700

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	5
Number of Online Controls	5	Number of Time/Area Diagrams	0
Number of Offline Controls	2	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.361
Region	England and Wales	Cv (Summer)	0.740
M5-60 (mm)	18.000	Cv (Winter)	0.850

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
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)	100
Climate Change (%)	30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1a	15 Winter	100	+30%	100/15 Summer				35.915
S1.001	S1	15 Winter	100	+30%	100/15 Summer				35.732
S2.000	Srwp	15 Winter	100	+30%	100/15 Summer				35.442
S2.001	S11	15 Winter	100	+30%	100/15 Summer				35.119
S3.000	S13	120 Winter	100	+30%					35.000
S3.001	S14	120 Winter	100	+30%					34.828
S2.002	S12	15 Winter	100	+30%	100/15 Summer				35.052
S1.002	S2	15 Winter	100	+30%	100/15 Summer				34.934
S1.003	S3	15 Winter	100	+30%	100/15 Summer				34.848
S1.004	S4	15 Winter	100	+30%	100/15 Summer				34.744
S4.000	Sre	15 Winter	100	+30%					34.589
S1.005	S5	15 Winter	100	+30%	100/15 Summer				34.579
S5.000	Srwp	15 Winter	100	+30%	100/15 Summer				36.169
S1.006	S6	60 Winter	100	+30%	100/15 Summer				34.409
S1.007	S7	60 Winter	100	+30%	100/15 Summer				34.398
S1.008	S8	60 Winter	100	+30%	100/15 Summer				34.382
S6.000	Srwp	15 Winter	100	+30%					35.170
S6.001	S21	15 Winter	100	+30%					34.847
S6.002	S18a	15 Winter	100	+30%					34.818

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1a	0.375	0.000	1.12		19.5	SURCHARGED	
S1.001	S1	0.413	0.000	1.52		28.0	SURCHARGED	
S2.000	Srwp	0.142	0.000	1.33		9.9	SURCHARGED*	
S2.001	S11	0.669	0.000	0.61		15.0	SURCHARGED	
S3.000	S13	-0.100	0.000	0.00		0.0	OK	
S3.001	S14	-0.100	0.000	0.00		0.0	OK	
S2.002	S12	0.857	0.000	0.60		15.8	SURCHARGED	
S1.002	S2	1.100	0.000	1.04		66.1	SURCHARGED	
S1.003	S3	1.094	0.000	1.09		70.8	SURCHARGED	
S1.004	S4	1.087	0.000	1.42		91.1	SURCHARGED	
S4.000	Sre	-0.011	0.000	0.11		2.4	OK	
S1.005	S5	1.008	0.000	1.48		95.6	SURCHARGED	
S5.000	Srwp	1.069	0.000	2.62		15.2	SURCHARGED	
S1.006	S6	0.931	0.000	1.41		71.8	SURCHARGED	
S1.007	S7	0.957	0.000	1.40		77.6	SURCHARGED	
S1.008	S8	1.003	0.000	1.23		74.7	SURCHARGED	
S6.000	Srwp	-0.030	0.000	0.83		4.0	OK	
S6.001	S21	-0.033	0.000	0.67		4.0	OK	
S6.002	S18a	0.000	0.000	1.02		14.5	OK	

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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
S6.003	S22	15 Winter	100	+30%	100/15 Summer	
S7.000	S-Siphonic Gutter	30 Winter	100	+30%		
S7.001	S-Siphonic RWP	30 Winter	100	+30%		
S7.002	S-Siphonic Connection	30 Winter	100	+30%		
S7.003	Sgravity change slope	15 Summer	100	+30%		
S8.000	Sgutter	15 Winter	100	+30%		
S8.001	Ssipone downpie	15 Winter	100	+30%	100/15 Summer	
S8.002	Sgravity	15 Winter	100	+30%		
S8.003	Sgravity changed slope	15 Summer	100	+30%		
S7.004	S26	60 Winter	100	+30%	100/30 Winter	
S1.009	S9	60 Winter	100	+30%	100/15 Summer	
S9.000	S channel	60 Winter	100	+30%	100/60 Winter	
S9.001	S16	60 Winter	100	+30%	100/15 Summer	
S9.002	Sjunction	120 Winter	100	+30%		
S9.003	S17	60 Winter	100	+30%	100/15 Summer	
S9.004	S18	60 Winter	100	+30%	100/15 Summer	
S9.005	Sjunction	60 Winter	100	+30%	100/15 Summer	
S9.006	Sjunction	60 Winter	100	+30%	100/15 Summer	
S9.007	S19a	60 Winter	100	+30%	100/15 Summer	
S9.008	S19	60 Winter	100	+30%	100/30 Summer	
S1.010	Stank	60 Winter	100	+30%	100/15 Summer	
S10.000	S24	60 Winter	100	+30%	100/60 Winter	
S11.000	Schannel	15 Winter	100	+30%		
S10.001	S25	60 Winter	100	+30%	100/60 Winter	
S12.000	S23	15 Winter	100	+30%		
S1.011	S10	60 Winter	100	+30%	100/15 Summer	
S13.000	Sex18	15 Winter	100	+30%	100/15 Summer	
S13.001	Sex17	15 Winter	100	+30%	100/15 Summer	
S13.002	Sex16	15 Winter	100	+30%	100/15 Summer	
S13.003	Scw01	15 Winter	100	+30%	100/15 Summer	
S13.004	Scw02	15 Winter	100	+30%	100/15 Summer	
S13.005	Scw3	15 Winter	100	+30%	100/15 Summer	
S13.006	Scw04	15 Winter	100	+30%	100/15 Summer	
S13.007	Scw05	15 Winter	100	+30%	100/15 Summer	
S13.008	Scw06	15 Winter	100	+30%		
S13.009	Scw07	15 Winter	100	+30%		
S13.010	Scw08	15 Winter	100	+30%		
S1.012	SCW09	60 Winter	100	+30%	100/15 Summer	

PN	US/MH Name	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.
S6.003	S22			34.566	0.026	0.000	1.12
S7.000	S-Siphonic Gutter			37.553	-0.097	0.000	0.03
S7.001	S-Siphonic RWP	100/15 Summer	24	37.533	-0.089	0.000	0.57
S7.002	S-Siphonic Connection			35.029	-0.171	0.000	0.38
S7.003	Sgravity change slope			34.808	-0.217	0.000	0.16

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

PN	US/MH Name	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.
S8.000	Sgutter			37.869	-0.131	0.000	0.04
S8.001	Ssipone downpie	100/15 Summer	7	37.853	0.278	0.000	0.43
S8.002	Sgravity			34.978	-0.072	0.000	0.54
S8.003	Sgravity changed slope			34.776	-0.108	0.000	0.17
S7.004	S26			34.439	0.739	0.000	0.80
S1.009	S9			34.354	1.704	0.000	0.74
S9.000	S channel			34.048	0.118	0.000	0.15
S9.001	S16			34.049	0.324	0.000	0.17
S9.002	Sjunction			33.702	0.000	0.000	0.22
S9.003	S17			34.292	0.643	0.000	0.43
S9.004	S18			34.291	0.664	0.000	0.65
S9.005	Sjunction			34.285	0.737	0.000	0.74
S9.006	Sjunction			34.279	0.864	0.000	0.93
S9.007	S19a			34.276	0.915	0.000	1.19
S9.008	S19			34.269	0.964	0.000	0.15
S1.010	Stank			34.251	1.681	0.000	0.47
S10.000	S24			34.239	0.359	0.000	0.04
S11.000	Schannel			34.402	-0.088	0.000	0.36
S10.001	S25			34.240	0.510	0.000	0.53
S12.000	S23			34.629	-0.091	0.000	0.32
S1.011	S10			34.236	1.857	0.000	0.37
S13.000	Sex18			36.383	0.093	0.000	1.21
S13.001	Sex17			35.983	0.493	0.000	1.62
S13.002	Sex16			35.847	1.167	0.000	2.11
S13.003	Scw01			35.554	0.946	0.000	1.81
S13.004	Scw02			35.023	0.577	0.000	2.73
S13.005	Scw3			34.753	0.343	0.000	2.02
S13.006	Scw04			34.482	0.138	0.000	1.47
S13.007	Scw05			33.782	0.027	0.000	1.21
S13.008	Scw06			33.507	-0.123	0.000	0.63
S13.009	Scw07			33.314	-0.166	0.000	0.40
S13.010	Scw08			32.943	-0.202	0.000	0.23
S1.012	SCW09			32.818	0.957	0.000	0.63

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S6.003	S22		17.6	SURCHARGED	
S7.000	S-Siphonic Gutter		83.7	OK	
S7.001	S-Siphonic RWP	0.5	39.0	OK*	
S7.002	S-Siphonic Connection		39.5	OK*	
S7.003	Sgravity change slope		39.5	OK*	
S8.000	Sgutter		24.8	FLOOD RISK	
S8.001	Ssipone downpie	0.5	9.0	FLOOD RISK*	
S8.002	Sgravity		9.5	OK*	
S8.003	Sgravity changed slope		9.5	OK*	
S7.004	S26		49.0	SURCHARGED	

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

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.009	S9		125.0	SURCHARGED	
S9.000	S channel		3.2	SURCHARGED	
S9.001	S16		4.2	SURCHARGED	
S9.002	Sjunction		7.2	SURCHARGED*	
S9.003	S17		10.9	SURCHARGED	
S9.004	S18		20.0	SURCHARGED	
S9.005	Sjunction		25.7	SURCHARGED*	
S9.006	Sjunction		30.8	SURCHARGED*	
S9.007	S19a		35.2	SURCHARGED	
S9.008	S19		33.0	SURCHARGED	
S1.010	Stank		69.2	SURCHARGED	
S10.000	S24		0.3	SURCHARGED	
S11.000	Schannel		14.9	OK	
S10.001	S25		8.1	SURCHARGED	
S12.000	S23		5.3	OK	
S1.011	S10		66.9	SURCHARGED	
S13.000	Sex18		9.0	FLOOD RISK*	
S13.001	Sex17		26.7	SURCHARGED*	
S13.002	Sex16		33.8	FLOOD RISK*	
S13.003	Scw01		32.4	SURCHARGED*	
S13.004	Scw02		32.5	SURCHARGED*	
S13.005	Scw3		32.5	SURCHARGED	
S13.006	Scw04		32.5	SURCHARGED	
S13.007	Scw05		43.9	SURCHARGED	
S13.008	Scw06		58.1	OK	
S13.009	Scw07		58.5	OK	
S13.010	Scw08		58.5	OK	
S1.012	SCW09		110.8	SURCHARGED	

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