

AKSWard		Page 1
Seacourt Tower West Way Oxford	Colt Industrial Havant	
Date 06/07/2020 File S198061 - Proposed SW_P...	Designed by NJ Checked by GT	
Micro Drainage	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)	30	PIMP (%)	100
M5-60 (mm)	19.300	Add Flow / Climate Change (%)	0
Ratio R	0.350	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.	0.750	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	0.730	4-8	0.607	8-12	0.001

Total Area Contributing (ha) = 1.338

Total Pipe Volume (m³) = 36.929

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
S1.000	6.179	1.000	6.2	0.050	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	24.053	0.650	37.0	0.080	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	11.937	0.323	37.0	0.052	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.003	10.027	0.271	37.0	0.039	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	22.206	0.600	37.0	0.039	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	5.613	0.100	56.1	0.017	5.00	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	5.03	25.070	0.050	0.0	0.0	0.0	4.08	72.1	6.8
S1.001	50.00	5.21	23.995	0.130	0.0	0.0	0.0	2.16	85.8	17.6
S1.002	50.00	5.30	23.345	0.182	0.0	0.0	0.0	2.16	85.8	24.7
S1.003	50.00	5.38	23.022	0.221	0.0	0.0	0.0	2.16	85.8	29.9
S1.004	50.00	5.55	22.751	0.261	0.0	0.0	0.0	2.16	85.8	35.3
S2.000	50.00	5.07	22.770	0.017	0.0	0.0	0.0	1.35	23.8	2.3

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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
S1.005	13.076	0.353	37.0	0.032	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.006	38.784	1.670	23.2	0.038	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	12.813	0.427	30.0	0.072	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	5.420	0.108	50.0	0.023	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	5.063	0.127	40.0	0.019	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.008	13.554	0.452	30.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.009	19.461	0.608	32.0	0.002	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.010	11.948	0.291	41.0	0.053	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.011	17.354	0.200	86.9	0.011	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	5.163	0.480	10.8	0.028	5.00	0.0	0.600	o	150	Pipe/Conduit	
S4.001	5.731	0.040	143.3	0.041	0.00	0.0	0.600	o	150	Pipe/Conduit	
S4.002	43.938	0.293	150.0	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit	
S5.000	4.726	0.060	78.8	0.046	5.00	0.0	0.600	o	100	Pipe/Conduit	
S5.001	5.136	0.034	151.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S4.003	11.218	0.075	149.6	0.072	0.00	0.0	0.600	o	225	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)
S1.005	50.00	5.65	22.151	0.310	0.0	0.0	0.0	2.16	85.8	41.9
S1.006	50.00	5.89	21.798	0.348	0.0	0.0	0.0	2.73	108.4	47.1
S1.007	50.00	5.96	20.053	0.420	0.0	0.0	0.0	2.88	203.7	56.9
S3.000	50.00	5.06	20.520	0.023	0.0	0.0	0.0	1.43	25.2	3.1
S3.001	50.00	5.12	20.412	0.042	0.0	0.0	0.0	1.60	28.2	5.6
S1.008	50.00	6.04	19.626	0.462	0.0	0.0	0.0	2.88	203.7	62.5
S1.009	50.00	6.16	19.174	0.463	0.0	0.0	0.0	2.79	197.2	62.7
S1.010	50.00	6.23	18.491	0.517	0.0	0.0	0.0	2.84	313.3	70.0
S1.011	50.00	6.38	18.199	0.527	0.0	0.0	0.0	1.94	214.7	71.4
S4.000	50.00	5.03	19.680	0.028	0.0	0.0	0.0	3.09	54.6	3.7
S4.001	50.00	5.14	19.200	0.069	0.0	0.0	0.0	0.84	14.8	9.3
S4.002	50.00	6.04	19.160	0.073	0.0	0.0	0.0	0.82	14.5	9.9
S5.000	50.00	5.09	19.550	0.046	0.0	0.0	0.0	0.87	6.8	6.3
S5.001	50.00	5.20	19.440	0.046	0.0	0.0	0.0	0.82	14.4	6.3
S4.003	50.00	6.21	18.792	0.192	0.0	0.0	0.0	1.07	42.4	25.9

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Micro Drainage

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
S6.000	28.245	0.188	150.2	0.081	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.001	9.012	0.180	50.0	0.077	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.000	7.962	0.318	25.0	0.043	5.00	0.0	0.600	o	150	Pipe/Conduit	
S4.004	23.898	0.119	200.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.005	26.160	0.131	200.0	0.020	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.006	12.103	0.061	200.0	0.015	0.00	0.0	0.600	o	300	Pipe/Conduit	
S8.000	23.699	0.158	150.0	0.025	5.00	0.0	0.600	o	100	Pipe/Conduit	
S8.001	16.284	0.109	150.0	0.044	0.00	0.0	0.600	o	150	Pipe/Conduit	
S8.002	5.908	0.039	150.0	0.011	0.00	0.0	0.600	o	150	Pipe/Conduit	
S8.003	32.186	0.363	88.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S9.000	7.305	0.732	10.0	0.025	5.00	0.0	0.600	o	100	Pipe/Conduit	
S4.007	16.509	0.083	200.0	0.034	0.00	0.0	0.600	o	375	Pipe/Conduit	
S10.000	4.067	0.028	145.3	0.030	5.00	0.0	0.600	o	100	Pipe/Conduit	
S4.008	25.856	0.129	200.0	0.016	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)
S6.000	50.00	5.44	19.820	0.081	0.0	0.0	0.0	1.06	42.3	10.9
S6.001	50.00	5.52	19.632	0.157	0.0	0.0	0.0	1.85	73.7	21.3
S7.000	50.00	5.07	19.770	0.043	0.0	0.0	0.0	2.02	35.7	5.9
S4.004	50.00	6.57	18.642	0.392	0.0	0.0	0.0	1.11	78.3	53.1
S4.005	50.00	6.96	18.523	0.412	0.0	0.0	0.0	1.11	78.3	55.8
S4.006	50.00	7.15	18.392	0.427	0.0	0.0	0.0	1.11	78.3	57.9
S8.000	50.00	5.63	19.200	0.025	0.0	0.0	0.0	0.63	4.9	3.4
S8.001	50.00	5.96	18.992	0.070	0.0	0.0	0.0	0.82	14.5	9.4
S8.002	50.00	6.08	18.883	0.081	0.0	0.0	0.0	0.82	14.5	11.0
S8.003	50.00	6.59	18.844	0.081	0.0	0.0	0.0	1.07	18.9	11.0
S9.000	50.00	5.05	19.500	0.025	0.0	0.0	0.0	2.46	19.3	3.4
S4.007	50.00	7.36	18.256	0.568	0.0	0.0	0.0	1.28	141.1	76.9
S10.000	50.00	5.11	19.730	0.030	0.0	0.0	0.0	0.64	5.0	4.0
S4.008	50.00	7.70	18.174	0.614	0.0	0.0	0.0	1.28	141.1	83.1

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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
S11.000	23.441	0.156	150.3	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
S12.000	5.523	0.156	35.4	0.020	5.00	0.0	0.600	o	100	Pipe/Conduit	
S11.001	25.707	0.171	150.3	0.043	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.000	5.506	0.317	17.3	0.019	5.00	0.0	0.600	o	100	Pipe/Conduit	
S11.002	29.653	0.198	149.8	0.031	0.00	0.0	0.600	o	225	Pipe/Conduit	
S14.000	8.421	0.281	30.0	0.028	5.00	0.0	0.600	o	100	Pipe/Conduit	
S11.003	19.107	0.127	150.4	0.020	0.00	0.0	0.600	o	225	Pipe/Conduit	
S15.000	4.821	0.161	30.0	0.019	5.00	0.0	0.600	o	100	Pipe/Conduit	
S11.004	10.248	0.068	150.0	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.009	10.878	0.045	241.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.012	38.469	0.250	153.9	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)
S11.000	50.00	5.37	19.700	0.000	0.0	0.0	0.0	1.06	42.3	0.0
S12.000	50.00	5.07	19.730	0.020	0.0	0.0	0.0	1.30	10.2	2.7
S11.001	50.00	5.77	19.449	0.063	0.0	0.0	0.0	1.06	42.3	8.5
S13.000	50.00	5.05	19.720	0.019	0.0	0.0	0.0	1.86	14.6	2.6
S11.002	50.00	6.23	19.278	0.113	0.0	0.0	0.0	1.07	42.4	15.3
S14.000	50.00	5.10	19.730	0.028	0.0	0.0	0.0	1.41	11.1	3.7
S11.003	50.00	6.53	19.080	0.161	0.0	0.0	0.0	1.06	42.3	21.8
S15.000	50.00	5.06	19.720	0.019	0.0	0.0	0.0	1.41	11.1	2.6
S11.004	50.00	6.69	18.953	0.197	0.0	0.0	0.0	1.07	42.4	26.7
S4.009	50.00	7.86	18.044	0.811	0.0	0.0	0.0	1.16	128.2	109.8
S1.012	50.00	8.25	17.924	1.338	0.0	0.0	0.0	1.64	260.3	181.2

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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	0.050	0.050	0.050
1.001	User	-	100	0.080	0.080	0.080
1.002	User	-	100	0.016	0.016	0.016
	User	-	100	0.005	0.005	0.021
	User	-	100	0.006	0.006	0.026
	User	-	100	0.026	0.026	0.052
1.003	User	-	100	0.006	0.006	0.006
	User	-	100	0.033	0.033	0.039
1.004	User	-	100	0.006	0.006	0.006
	User	-	100	0.011	0.011	0.017
	User	-	100	0.011	0.011	0.028
	User	-	100	0.012	0.012	0.039
2.000	User	-	100	0.006	0.006	0.006
	User	-	100	0.011	0.011	0.017
1.005	User	-	100	0.008	0.008	0.008
	User	-	100	0.005	0.005	0.013
	User	-	100	0.019	0.019	0.032
1.006	User	-	100	0.008	0.008	0.008
	User	-	100	0.009	0.009	0.017
	User	-	100	0.022	0.022	0.038
1.007	User	-	100	0.047	0.047	0.047
	User	-	100	0.019	0.019	0.066
	User	-	100	0.004	0.004	0.071
	User	-	100	0.002	0.002	0.072
3.000	User	-	100	0.023	0.023	0.023
3.001	User	-	100	0.015	0.015	0.015
	User	-	100	0.004	0.004	0.019
1.008	-	-	100	0.000	0.000	0.000
1.009	User	-	100	0.002	0.002	0.002
1.010	User	-	100	0.053	0.053	0.053
1.011	User	-	100	0.011	0.011	0.011
4.000	User	-	100	0.010	0.010	0.010
	User	-	100	0.015	0.015	0.024
	User	-	100	0.003	0.003	0.028
4.001	User	-	100	0.008	0.008	0.008
	User	-	100	0.007	0.007	0.014
	User	-	100	0.027	0.027	0.041
4.002	User	-	100	0.004	0.004	0.004
5.000	User	-	100	0.021	0.021	0.021
	User	-	100	0.020	0.020	0.041
	User	-	100	0.004	0.004	0.045
	User	-	100	0.002	0.002	0.046
5.001	-	-	100	0.000	0.000	0.000
4.003	User	-	100	0.012	0.012	0.012
	User	-	100	0.024	0.024	0.036
	User	-	100	0.034	0.034	0.070
	User	-	100	0.002	0.002	0.072
6.000	User	-	100	0.015	0.015	0.015
	User	-	100	0.001	0.001	0.016
	User	-	100	0.064	0.064	0.081
6.001	User	-	100	0.052	0.052	0.052

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
	User	-	100	0.010	0.010	0.062
	User	-	100	0.014	0.014	0.077
7.000	User	-	100	0.041	0.041	0.041
	User	-	100	0.002	0.002	0.043
4.004	-	-	100	0.000	0.000	0.000
4.005	User	-	100	0.008	0.008	0.008
	User	-	100	0.012	0.012	0.020
4.006	User	-	100	0.015	0.015	0.015
8.000	User	-	100	0.025	0.025	0.025
8.001	User	-	100	0.033	0.033	0.033
	User	-	100	0.011	0.011	0.044
8.002	User	-	100	0.011	0.011	0.011
8.003	-	-	100	0.000	0.000	0.000
9.000	User	-	100	0.022	0.022	0.022
	User	-	100	0.003	0.003	0.025
4.007	User	-	100	0.034	0.034	0.034
10.000	User	-	100	0.005	0.005	0.005
	User	-	100	0.025	0.025	0.030
4.008	User	-	100	0.016	0.016	0.016
11.000	-	-	100	0.000	0.000	0.000
12.000	User	-	100	0.019	0.019	0.019
	User	-	100	0.001	0.001	0.020
11.001	User	-	100	0.030	0.030	0.030
	User	-	100	0.007	0.007	0.036
	User	-	100	0.002	0.002	0.038
	User	-	100	0.002	0.002	0.041
	User	-	100	0.001	0.001	0.041
	User	-	100	0.002	0.002	0.043
13.000	User	-	100	0.019	0.019	0.019
11.002	User	-	100	0.031	0.031	0.031
14.000	User	-	100	0.019	0.019	0.019
	User	-	100	0.005	0.005	0.024
	User	-	100	0.003	0.003	0.028
11.003	User	-	100	0.020	0.020	0.020
15.000	User	-	100	0.019	0.019	0.019
11.004	User	-	100	0.017	0.017	0.017
4.009	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.338	1.338	1.338

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_ExMH25	19.700	17.674	0.000	1500	0

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<u>Surcharged Outfall Details for Storm</u> Datum (m) 0.000 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)
30	18.300	1440	18.300	2850	18.300	4260	18.300	5670	18.300	7080	18.300
60	18.300	1470	18.300	2880	18.300	4290	18.300	5700	18.300	7110	18.300
90	18.300	1500	18.300	2910	18.300	4320	18.300	5730	18.300	7140	18.300
120	18.300	1530	18.300	2940	18.300	4350	18.300	5760	18.300	7170	18.300
150	18.300	1560	18.300	2970	18.300	4380	18.300	5790	18.300	7200	18.300
180	18.300	1590	18.300	3000	18.300	4410	18.300	5820	18.300	7230	18.300
210	18.300	1620	18.300	3030	18.300	4440	18.300	5850	18.300	7260	18.300
240	18.300	1650	18.300	3060	18.300	4470	18.300	5880	18.300	7290	18.300
270	18.300	1680	18.300	3090	18.300	4500	18.300	5910	18.300	7320	18.300
300	18.300	1710	18.300	3120	18.300	4530	18.300	5940	18.300	7350	18.300
330	18.300	1740	18.300	3150	18.300	4560	18.300	5970	18.300	7380	18.300
360	18.300	1770	18.300	3180	18.300	4590	18.300	6000	18.300	7410	18.300
390	18.300	1800	18.300	3210	18.300	4620	18.300	6030	18.300	7440	18.300
420	18.300	1830	18.300	3240	18.300	4650	18.300	6060	18.300	7470	18.300
450	18.300	1860	18.300	3270	18.300	4680	18.300	6090	18.300	7500	18.300
480	18.300	1890	18.300	3300	18.300	4710	18.300	6120	18.300	7530	18.300
510	18.300	1920	18.300	3330	18.300	4740	18.300	6150	18.300	7560	18.300
540	18.300	1950	18.300	3360	18.300	4770	18.300	6180	18.300	7590	18.300
570	18.300	1980	18.300	3390	18.300	4800	18.300	6210	18.300	7620	18.300
600	18.300	2010	18.300	3420	18.300	4830	18.300	6240	18.300	7650	18.300
630	18.300	2040	18.300	3450	18.300	4860	18.300	6270	18.300	7680	18.300
660	18.300	2070	18.300	3480	18.300	4890	18.300	6300	18.300	7710	18.300
690	18.300	2100	18.300	3510	18.300	4920	18.300	6330	18.300	7740	18.300
720	18.300	2130	18.300	3540	18.300	4950	18.300	6360	18.300	7770	18.300
750	18.300	2160	18.300	3570	18.300	4980	18.300	6390	18.300	7800	18.300
780	18.300	2190	18.300	3600	18.300	5010	18.300	6420	18.300	7830	18.300
810	18.300	2220	18.300	3630	18.300	5040	18.300	6450	18.300	7860	18.300
840	18.300	2250	18.300	3660	18.300	5070	18.300	6480	18.300	7890	18.300
870	18.300	2280	18.300	3690	18.300	5100	18.300	6510	18.300	7920	18.300
900	18.300	2310	18.300	3720	18.300	5130	18.300	6540	18.300	7950	18.300
930	18.300	2340	18.300	3750	18.300	5160	18.300	6570	18.300	7980	18.300
960	18.300	2370	18.300	3780	18.300	5190	18.300	6600	18.300	8010	18.300
990	18.300	2400	18.300	3810	18.300	5220	18.300	6630	18.300	8040	18.300
1020	18.300	2430	18.300	3840	18.300	5250	18.300	6660	18.300	8070	18.300
1050	18.300	2460	18.300	3870	18.300	5280	18.300	6690	18.300	8100	18.300
1080	18.300	2490	18.300	3900	18.300	5310	18.300	6720	18.300	8130	18.300
1110	18.300	2520	18.300	3930	18.300	5340	18.300	6750	18.300	8160	18.300
1140	18.300	2550	18.300	3960	18.300	5370	18.300	6780	18.300	8190	18.300
1170	18.300	2580	18.300	3990	18.300	5400	18.300	6810	18.300	8220	18.300
1200	18.300	2610	18.300	4020	18.300	5430	18.300	6840	18.300	8250	18.300
1230	18.300	2640	18.300	4050	18.300	5460	18.300	6870	18.300	8280	18.300
1260	18.300	2670	18.300	4080	18.300	5490	18.300	6900	18.300	8310	18.300
1290	18.300	2700	18.300	4110	18.300	5520	18.300	6930	18.300	8340	18.300
1320	18.300	2730	18.300	4140	18.300	5550	18.300	6960	18.300	8370	18.300
1350	18.300	2760	18.300	4170	18.300	5580	18.300	6990	18.300	8400	18.300
1380	18.300	2790	18.300	4200	18.300	5610	18.300	7020	18.300	8430	18.300
1410	18.300	2820	18.300	4230	18.300	5640	18.300	7050	18.300	8460	18.300
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Surcharged Outfall Details for Storm

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
8490	18.300	8760	18.300	9030	18.300	9300	18.300	9570	18.300	9840	18.300
8520	18.300	8790	18.300	9060	18.300	9330	18.300	9600	18.300	9870	18.300
8550	18.300	8820	18.300	9090	18.300	9360	18.300	9630	18.300	9900	18.300
8580	18.300	8850	18.300	9120	18.300	9390	18.300	9660	18.300	9930	18.300
8610	18.300	8880	18.300	9150	18.300	9420	18.300	9690	18.300	9960	18.300
8640	18.300	8910	18.300	9180	18.300	9450	18.300	9720	18.300	9990	18.300
8670	18.300	8940	18.300	9210	18.300	9480	18.300	9750	18.300	10020	18.300
8700	18.300	8970	18.300	9240	18.300	9510	18.300	9780	18.300		
8730	18.300	9000	18.300	9270	18.300	9540	18.300	9810	18.300		

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	10.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /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	11
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)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.300	Storm Duration (mins)	30
Ratio R	0.350		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: STank, DS/PN: S1.012, Volume (m³): 6.5

Unit Reference	MD-SHE-0310-6400-2300-6400
Design Head (m)	2.300
Design Flow (l/s)	64.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	310
Invert Level (m)	17.999
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.300	64.0
Flush-Flo™	0.690	64.0
Kick-Flo®	1.511	52.2
Mean Flow over Head Range	-	55.2

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.4	1.200	60.6	3.000	72.7	7.000	109.8
0.200	31.8	1.400	56.4	3.500	78.4	7.500	113.6
0.300	54.9	1.600	53.7	4.000	83.6	8.000	117.2
0.400	60.9	1.800	56.8	4.500	88.6	8.500	120.7
0.500	62.9	2.000	59.8	5.000	93.2	9.000	124.2
0.600	63.8	2.200	62.6	5.500	97.7	9.500	127.5
0.800	63.8	2.400	65.3	6.000	101.9		
1.000	62.6	2.600	67.9	6.500	105.9		

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Storage Structures for Storm

Porous Car Park Manhole: S013, DS/PN: S1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	45.6
Max Percolation (l/s)	60.8	Slope (1:X)	30.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	24.760	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: SJT, DS/PN: S1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	33.6
Max Percolation (l/s)	44.8	Slope (1:X)	25.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	22.960	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: S055, DS/PN: S1.010

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	16.8
Membrane Percolation (mm/hr)	1000	Length (m)	4.8
Max Percolation (l/s)	22.4	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	19.960	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: S078, DS/PN: S4.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	19.2
Membrane Percolation (mm/hr)	1000	Length (m)	4.8
Max Percolation (l/s)	25.6	Slope (1:X)	80.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	20.000	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: S095, DS/PN: S4.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	36.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.8
Max Percolation (l/s)	48.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	20.050	Cap Volume Depth (m)	0.350

Porous Car Park Manhole: S069, DS/PN: S7.000

Infiltration Coefficient Base (m/hr)	0.00000	Max Percolation (l/s)	76.8
Membrane Percolation (mm/hr)	1000	Safety Factor	2.0

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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	10.000
Hot Start (mins)	0	MADD Factor * 10m ³ /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	11
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	0.350
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	19.300	Cv (Winter)	0.840

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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S008	15 Winter	1	+0%	100/15 Summer			
S1.001	S013	15 Winter	1	+0%	100/15 Summer			
S1.002	SJT	15 Winter	1	+0%				
S1.003	SJT	15 Winter	1	+0%				
S1.004	SJT	15 Winter	1	+0%				
S2.000	S040	15 Winter	1	+0%	100/15 Summer			
S1.005	SJT	15 Winter	1	+0%	30/15 Summer	100/15 Winter		
S1.006	S044	15 Winter	1	+0%	30/15 Summer			
S1.007	S047	15 Winter	1	+0%	100/15 Summer			
S3.000	S051	15 Winter	1	+0%	100/120 Winter			
S3.001	SJT	15 Winter	1	+0%				
S1.008	SJT	15 Winter	1	+0%	100/15 Summer			
S1.009	SJT	15 Winter	1	+0%				
S1.010	S055	15 Winter	1	+0%	30/60 Summer	100/120 Winter		

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

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Overflow		Half Drain	Pipe	Level	
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)	Status	Exceeded
S1.000	S008	25.104	-0.116	0.000	0.12			7.0	OK	
S1.001	S013	24.065	-0.155	0.000	0.21		7	16.6	OK	
S1.002	SJT	23.427	-0.142	0.000	0.28			22.7	OK*	
S1.003	SJT	23.118	-0.129	0.000	0.37			27.5	OK*	
S1.004	SJT	22.847	-0.129	0.000	0.38			32.3	OK*	
S2.000	S040	22.805	-0.115	0.000	0.12			2.4	OK	
S1.005	SJT	22.267	-0.109	0.000	0.52		8	38.5	OK	1
S1.006	S044	21.900	-0.123	0.000	0.42			42.9	OK	
S1.007	S047	20.168	-0.185	0.000	0.31			50.9	OK	
S3.000	S051	20.559	-0.111	0.000	0.15			3.2	OK	
S3.001	SJT	20.462	-0.099	0.000	0.24			5.4	OK*	
S1.008	SJT	19.745	-0.180	0.000	0.33			55.6	OK*	
S1.009	SJT	19.284	-0.190	0.000	0.29			56.2	OK*	
S1.010	S055	18.631	-0.235	0.000	0.30		7	62.4	OK	2

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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.
S1.011	S056	240 Winter	1	+0%	30/30 Summer			
S4.000	S077	15 Winter	1	+0%	30/15 Summer			
S4.001	S078	15 Winter	1	+0%	30/15 Summer			
S4.002	S079	15 Winter	1	+0%	30/15 Summer			
S5.000	S092	15 Winter	1	+0%	1/15 Summer	100/15 Summer		
S5.001	S094	15 Winter	1	+0%	30/15 Summer			
S4.003	S095	15 Winter	1	+0%	30/15 Summer			
S6.000	S058	15 Winter	1	+0%	100/15 Summer	100/15 Summer		
S6.001	SJT	15 Winter	1	+0%				
S7.000	S069	30 Summer	1	+0%	100/15 Summer			
S4.004	S096	15 Winter	1	+0%	30/15 Summer			
S4.005	SJT	15 Winter	1	+0%				
S4.006	SJT	15 Winter	1	+0%				
S8.000	S105	15 Winter	1	+0%	30/15 Summer			
S8.001	S108	15 Winter	1	+0%	30/15 Summer			
S8.002	SJT	15 Winter	1	+0%				
S8.003	S110	15 Winter	1	+0%	30/15 Summer			
S9.000	S114	15 Winter	1	+0%	100/15 Summer			
S4.007	S117	120 Winter	1	+0%	30/15 Summer			
S10.000	S126	15 Winter	1	+0%	30/15 Summer			
S4.008	SJT	120 Winter	1	+0%	30/15 Summer			
S11.000	S130	15 Summer	1	+0%	100/15 Summer			
S12.000	S129	15 Winter	1	+0%	100/15 Summer	100/15 Summer		
S11.001	SJT	15 Winter	1	+0%	100/15 Summer			
S13.000	S135	15 Winter	1	+0%	100/15 Summer	100/15 Winter		
S11.002	SJT	15 Winter	1	+0%				
S14.000	S139	15 Winter	1	+0%	100/15 Summer	100/15 Winter		
S11.003	S140	15 Winter	1	+0%	30/15 Summer			
S15.000	S144	15 Winter	1	+0%	100/15 Summer			
S11.004	S145	15 Winter	1	+0%	30/15 Summer			
S4.009	S146	240 Winter	1	+0%	1/120 Winter			
S1.012	STank	240 Winter	1	+0%	1/60 Winter			

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m ³)			Time (mins)	Flow (l/s)	
S1.011	S056	18.465	-0.109	0.000	0.09			16.5	OK
S4.000	S077	19.710	-0.120	0.000	0.09			3.9	OK
S4.001	S078	19.296	-0.054	0.000	0.71		7	8.8	OK
S4.002	S079	19.250	-0.060	0.000	0.64			9.0	OK
S5.000	S092	19.662	0.012	0.000	1.09			6.5	SURCHARGED
S5.001	S094	19.522	-0.068	0.000	0.56			6.5	
S4.003	S095	18.926	-0.091	0.000	0.65		6	23.5	OK
S6.000	S058	19.903	-0.142	0.000	0.28			11.2	OK
S6.001	SJT	19.723	-0.134	0.000	0.34			20.3	OK*
S7.000	S069	19.816	-0.104	0.000	0.18		6	5.4	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		Half Drain		Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)				
S4.004	S096	18.830	-0.112	0.000	0.70				48.7	OK	
S4.005	SJT	18.697	-0.125	0.000	0.63				49.6	OK*	
S4.006	SJT	18.603	-0.089	0.000	0.84				51.5	OK*	
S8.000	S105	19.265	-0.035	0.000	0.73		6	3.5		OK	
S8.001	S108	19.081	-0.061	0.000	0.65		7	8.7		OK	
S8.002	SJT	18.986	-0.047	0.000	0.81			10.0		OK*	
S8.003	S110	18.924	-0.070	0.000	0.55			10.1		OK	
S9.000	S114	19.531	-0.069	0.000	0.20			3.6		OK	
S4.007	S117	18.516	-0.115	0.000	0.25		42	28.4		OK	
S10.000	S126	19.811	-0.019	0.000	0.98			4.2		OK	
S4.008	SJT	18.498	-0.051	0.000	0.21			29.9		OK*	
S11.000	S130	19.700	-0.225	0.000	0.00			0.0		OK	
S12.000	S129	19.768	-0.062	0.000	0.31			2.8		OK	
S11.001	SJT	19.515	-0.159	0.000	0.19			7.9		OK*	
S13.000	S135	19.751	-0.069	0.000	0.21			2.7		OK	
S11.002	SJT	19.368	-0.135	0.000	0.34			14.2		OK*	
S14.000	S139	19.773	-0.057	0.000	0.38			3.9		OK	
S11.003	S140	19.196	-0.108	0.000	0.53			20.1		OK	
S15.000	S144	19.756	-0.064	0.000	0.28			2.7		OK	
S11.004	S145	19.084	-0.093	0.000	0.64		5	22.6		OK	
S4.009	S146	18.466	0.047	0.000	0.25			24.2		SURCHARGED	
S1.012	STank	18.460	0.086	0.000	0.10			22.6		SURCHARGED	

PN	US/MH Name	Level Exceeded
S1.011	S056	
S4.000	S077	
S4.001	S078	
S4.002	S079	
S5.000	S092	5
S5.001	S094	
S4.003	S095	
S6.000	S058	3
S6.001	SJT	
S7.000	S069	
S4.004	S096	
S4.005	SJT	
S4.006	SJT	
S8.000	S105	
S8.001	S108	
S8.002	SJT	
S8.003	S110	
S9.000	S114	
S4.007	S117	
S10.000	S126	

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

PN	US/MH Name	Level Exceeded
S4.008	SJT	
S11.000	S130	
S12.000	S129	2
S11.001	SJT	
S13.000	S135	1
S11.002	SJT	
S14.000	S139	1
S11.003	S140	
S15.000	S144	
S11.004	S145	
S4.009	S146	
S1.012	STank	

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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	10.000
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	11
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	0.350
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	19.300	Cv (Winter)	0.840

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, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S008	15 Winter	30	+0%	100/15 Summer			
S1.001	S013	15 Winter	30	+0%	100/15 Summer			
S1.002	SJT	15 Summer	30	+0%				
S1.003	SJT	15 Summer	30	+0%				
S1.004	SJT	15 Summer	30	+0%				
S2.000	S040	15 Winter	30	+0%	100/15 Summer			
S1.005	SJT	15 Winter	30	+0%	30/15 Summer	100/15 Winter		
S1.006	S044	15 Winter	30	+0%	30/15 Summer			
S1.007	S047	15 Winter	30	+0%	100/15 Summer			
S3.000	S051	15 Winter	30	+0%	100/120 Winter			
S3.001	SJT	15 Winter	30	+0%				
S1.008	SJT	15 Winter	30	+0%	100/15 Summer			
S1.009	SJT	15 Winter	30	+0%				
S1.010	S055	120 Winter	30	+0%	30/60 Summer	100/120 Winter		
S1.011	S056	120 Winter	30	+0%	30/30 Summer			
S4.000	S077	15 Winter	30	+0%	30/15 Summer			
S4.001	S078	15 Winter	30	+0%	30/15 Summer			

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30 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 / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S008	25.125	-0.095	0.000	0.29		17.3	OK
S1.001	S013	24.120	-0.100	0.000	0.59	6	46.8	OK
S1.002	SJT	23.570	0.000	0.000	0.77		61.5	SURCHARGED*
S1.003	SJT	23.247	0.000	0.000	0.96		70.1	SURCHARGED*
S1.004	SJT	22.976	0.000	0.000	0.94		80.9	SURCHARGED*
S2.000	S040	22.826	-0.094	0.000	0.30		5.9	OK
S1.005	SJT	22.679	0.303	0.000	1.28	4	94.8	SURCHARGED
S1.006	S044	22.100	0.077	0.000	1.02		105.1	SURCHARGED
S1.007	S047	20.256	-0.097	0.000	0.79		128.9	OK
S3.000	S051	20.584	-0.086	0.000	0.38		7.8	OK
S3.001	SJT	20.502	-0.060	0.000	0.66		14.7	OK*
S1.008	SJT	19.840	-0.085	0.000	0.85		142.8	OK*
S1.009	SJT	19.367	-0.107	0.000	0.74		143.6	OK*
S1.010	S055	19.035	0.169	0.000	0.28	18	59.3	SURCHARGED
S1.011	S056	18.908	0.334	0.000	0.34		59.8	SURCHARGED
S4.000	S077	20.061	0.231	0.000	0.20		8.8	SURCHARGED
S4.001	S078	20.046	0.696	0.000	1.37	5	16.8	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	S008	
S1.001	S013	
S1.002	SJT	
S1.003	SJT	
S1.004	SJT	
S2.000	S040	
S1.005	SJT	1
S1.006	S044	
S1.007	S047	
S3.000	S051	
S3.001	SJT	
S1.008	SJT	
S1.009	SJT	
S1.010	S055	2
S1.011	S056	
S4.000	S077	
S4.001	S078	

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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.
S4.002	S079	15 Winter	30	+0%	30/15 Summer			
S5.000	S092	15 Winter	30	+0%	1/15 Summer	100/15 Summer		
S5.001	S094	15 Winter	30	+0%	30/15 Summer			
S4.003	S095	15 Winter	30	+0%	30/15 Summer			
S6.000	S058	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
S6.001	SJT	15 Winter	30	+0%				
S7.000	S069	15 Winter	30	+0%	100/15 Summer			
S4.004	S096	15 Winter	30	+0%	30/15 Summer			
S4.005	SJT	15 Summer	30	+0%				
S4.006	SJT	15 Summer	30	+0%				
S8.000	S105	15 Winter	30	+0%	30/15 Summer			
S8.001	S108	15 Winter	30	+0%	30/15 Summer			
S8.002	SJT	15 Summer	30	+0%				
S8.003	S110	15 Winter	30	+0%	30/15 Summer			
S9.000	S114	15 Winter	30	+0%	100/15 Summer			
S4.007	S117	120 Winter	30	+0%	30/15 Summer			
S10.000	S126	15 Winter	30	+0%	30/15 Summer			
S4.008	SJT	120 Winter	30	+0%	30/15 Summer			
S11.000	S130	15 Summer	30	+0%	100/15 Summer			
S12.000	S129	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
S11.001	SJT	15 Winter	30	+0%	100/15 Summer			
S13.000	S135	15 Winter	30	+0%	100/15 Summer	100/15 Winter		
S11.002	SJT	15 Summer	30	+0%				
S14.000	S139	15 Winter	30	+0%	100/15 Summer	100/15 Winter		
S11.003	S140	15 Winter	30	+0%	30/15 Summer			
S15.000	S144	15 Winter	30	+0%	100/15 Summer			
S11.004	S145	15 Winter	30	+0%	30/15 Summer			
S4.009	S146	120 Winter	30	+0%	1/120 Winter			
S1.012	STank	120 Winter	30	+0%	1/60 Winter			

PN	US/MH Name	Water			Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)					
S4.002	S079	20.007	0.697	0.000	1.34					18.9	SURCHARGED
S5.000	S092	20.150	0.500	0.000	2.44					14.5	SURCHARGED
S5.001	S094	19.853	0.263	0.000	1.20					13.9	SURCHARGED
S4.003	S095	19.811	0.794	0.000	1.24				6	44.7	SURCHARGED
S6.000	S058	19.961	-0.084	0.000	0.70					27.4	OK
S6.001	SJT	19.803	-0.054	0.000	0.91					54.2	OK*
S7.000	S069	19.844	-0.076	0.000	0.48				6	15.0	OK
S4.004	S096	19.693	0.751	0.000	1.51					104.9	SURCHARGED
S4.005	SJT	18.823	0.000	0.000	1.36					106.4	SURCHARGED*
S4.006	SJT	18.692	0.000	0.000	1.77					109.1	SURCHARGED*
S8.000	S105	19.869	0.569	0.000	1.45				4	6.9	SURCHARGED
S8.001	S108	19.645	0.503	0.000	1.38				6	18.6	SURCHARGED
S8.002	SJT	19.033	0.000	0.000	1.57					19.5	SURCHARGED*

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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		Water	Surcharged	Flooded			Half Drain	Pipe	
	US/MH	Level	Depth	Volume	Flow /	Overflow	Time	Flow	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	Status
S8.003	S110	19.366	0.372	0.000	1.06			19.2	SURCHARGED
S9.000	S114	19.550	-0.050	0.000	0.50			8.7	OK
S4.007	S117	19.097	0.465	0.000	0.56		43	63.3	SURCHARGED
S10.000	S126	19.965	0.135	0.000	2.40			10.2	SURCHARGED
S4.008	SJT	19.001	0.452	0.000	0.49			68.4	SURCHARGED*
S11.000	S130	19.700	-0.225	0.000	0.00			0.0	OK
S12.000	S129	19.796	-0.034	0.000	0.76			6.8	OK
S11.001	SJT	19.624	-0.050	0.000	0.51			21.7	OK*
S13.000	S135	19.771	-0.049	0.000	0.51			6.6	OK
S11.002	SJT	19.503	0.000	0.000	0.77			32.5	SURCHARGED*
S14.000	S139	19.807	-0.023	0.000	0.93			9.5	OK
S11.003	S140	19.458	0.154	0.000	1.23			47.1	SURCHARGED
S15.000	S144	19.781	-0.039	0.000	0.68			6.6	OK
S11.004	S145	19.261	0.084	0.000	1.53		5	54.4	SURCHARGED
S4.009	S146	18.884	0.465	0.000	0.95			90.9	SURCHARGED
S1.012	STank	18.802	0.427	0.000	0.27		89	62.6	SURCHARGED

PN	US/MH Name	Level Exceeded
S4.002	S079	
S5.000	S092	5
S5.001	S094	
S4.003	S095	
S6.000	S058	3
S6.001	SJT	
S7.000	S069	
S4.004	S096	
S4.005	SJT	
S4.006	SJT	
S8.000	S105	
S8.001	S108	
S8.002	SJT	
S8.003	S110	
S9.000	S114	
S4.007	S117	
S10.000	S126	
S4.008	SJT	
S11.000	S130	
S12.000	S129	2
S11.001	SJT	
S13.000	S135	1
S11.002	SJT	
S14.000	S139	1
S11.003	S140	
S15.000	S144	

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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>		
	US/MH	Level
PN	Name	Exceeded
S11.004	S145	
S4.009	S146	
S1.012	STank	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 10.000

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 11

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 0.350

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 19.300 Cv (Winter) 0.840

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, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 40

US/MH

Return Climate

First (X)

First (Y)

First (Z)

Overflow

PN

Name

Storm

Period

Change

Surcharge

Flood

Overflow

Act.

S1.000

S008

15 Winter

100

+40%

100/15 Summer

S1.001

S013

15 Winter

100

+40%

100/15 Summer

S1.002

SJT

15 Summer

100

+40%

S1.003

SJT

15 Summer

100

+40%

S1.004

SJT

15 Summer

100

+40%

S2.000

S040

15 Winter

100

+40%

100/15 Summer

S1.005

SJT

15 Winter

100

+40%

30/15 Summer

100/15 Winter

S1.006

S044

15 Winter

100

+40%

30/15 Summer

S1.007

S047

120 Winter

100

+40%

100/15 Summer

S3.000

S051

120 Winter

100

+40%

100/120 Winter

S3.001

SJT

15 Summer

100

+40%

S1.008

SJT

60 Winter

100

+40%

100/15 Summer

S1.009

SJT

15 Summer

100

+40%

S1.010

S055

120 Winter

100

+40%

30/60 Summer

100/120 Winter

S1.011

S056

120 Winter

100

+40%

30/30 Summer

S4.000

S077

30 Winter

100

+40%

30/15 Summer

S4.001

S078

30 Winter

100

+40%

30/15 Summer

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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
S1.000	S008	25.351	0.131	0.000	0.49		29.6	SURCHARGED
S1.001	S013	25.197	0.977	0.000	0.77	4	60.6	FLOOD RISK
S1.002	SJT	23.570	0.000	0.000	0.90		72.3	SURCHARGED*
S1.003	SJT	23.247	0.000	0.000	1.20		87.7	SURCHARGED*
S1.004	SJT	22.976	0.000	0.000	1.22		105.1	SURCHARGED*
S2.000	S040	23.521	0.601	0.000	0.44		8.6	FLOOD RISK
S1.005	SJT	23.501	1.125	0.711	1.54	5	114.1	FLOOD
S1.006	S044	22.765	0.742	0.000	1.19		122.2	FLOOD RISK
S1.007	S047	21.127	0.774	0.000	0.56		91.6	FLOOD RISK
S3.000	S051	20.943	0.273	0.000	0.24		4.9	FLOOD RISK
S3.001	SJT	20.562	0.000	0.000	1.13		25.2	SURCHARGED*
S1.008	SJT	20.435	0.509	0.000	0.86		145.0	SURCHARGED*
S1.009	SJT	19.474	0.000	0.000	0.95		185.2	SURCHARGED*
S1.010	S055	20.503	1.637	2.862	0.51	22	108.7	FLOOD
S1.011	S056	20.388	1.813	0.000	0.63		110.0	FLOOD RISK
S4.000	S077	20.391	0.561	0.000	0.30		12.9	FLOOD RISK
S4.001	S078	20.381	1.031	0.000	1.28	13	15.7	FLOOD RISK

PN	US/MH Name	Level Exceeded
S1.000	S008	
S1.001	S013	
S1.002	SJT	
S1.003	SJT	
S1.004	SJT	
S2.000	S040	
S1.005	SJT	1
S1.006	S044	
S1.007	S047	
S3.000	S051	
S3.001	SJT	
S1.008	SJT	
S1.009	SJT	
S1.010	S055	2
S1.011	S056	
S4.000	S077	
S4.001	S078	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) SurchARGE	First (Y) Flood	First (Z) Overflow	Overflow Act.
S4.002	S079	30 Winter	100	+40%	30/15 Summer			
S5.000	S092	15 Winter	100	+40%	1/15 Summer	100/15 Summer		
S5.001	S094	120 Winter	100	+40%	30/15 Summer			
S4.003	S095	120 Winter	100	+40%	30/15 Summer			
S6.000	S058	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S6.001	SJT	15 Summer	100	+40%				
S7.000	S069	120 Winter	100	+40%	100/15 Summer			
S4.004	S096	120 Winter	100	+40%	30/15 Summer			
S4.005	SJT	15 Summer	100	+40%				
S4.006	SJT	15 Summer	100	+40%				
S8.000	S105	120 Winter	100	+40%	30/15 Summer			
S8.001	S108	120 Winter	100	+40%	30/15 Summer			
S8.002	SJT	15 Summer	100	+40%				
S8.003	S110	120 Winter	100	+40%	30/15 Summer			
S9.000	S114	120 Winter	100	+40%	100/15 Summer			
S4.007	S117	120 Winter	100	+40%	30/15 Summer			
S10.000	S126	15 Winter	100	+40%	30/15 Summer			
S4.008	SJT	60 Summer	100	+40%	30/15 Summer			
S11.000	S130	15 Winter	100	+40%	100/15 Summer			
S12.000	S129	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S11.001	SJT	15 Summer	100	+40%	100/15 Summer			
S13.000	S135	15 Winter	100	+40%	100/15 Summer	100/15 Winter		
S11.002	SJT	15 Summer	100	+40%				
S14.000	S139	15 Winter	100	+40%	100/15 Summer	100/15 Winter		
S11.003	S140	120 Winter	100	+40%	30/15 Summer			
S15.000	S144	120 Winter	100	+40%	100/15 Summer			
S11.004	S145	120 Winter	100	+40%	30/15 Summer			
S4.009	S146	120 Winter	100	+40%	1/120 Winter			
S1.012	STank	120 Winter	100	+40%	1/60 Winter			

PN	US/MH Name	Water			Surcharged		Flooded		Half Drain Time (mins)	Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)					
S4.002	S079	20.350	1.040	0.000	1.11					15.6	FLOOD RISK
S5.000	S092	20.752	1.102	1.813	3.09					18.3	FLOOD
S5.001	S094	20.318	0.728	0.000	0.82					9.5	SURCHARGED
S4.003	S095	20.315	1.298	0.000	0.99			33		35.6	FLOOD RISK
S6.000	S058	20.502	0.457	1.654	1.10					43.2	FLOOD
S6.001	SJT	19.857	0.000	0.000	1.27					76.2	SURCHARGED*
S7.000	S069	20.313	0.393	0.000	0.82			42		25.2	FLOOD RISK
S4.004	S096	20.304	1.362	0.000	1.09					76.0	FLOOD RISK
S4.005	SJT	18.823	0.000	0.000	1.49					116.4	SURCHARGED*
S4.006	SJT	18.692	0.000	0.000	1.96					120.9	SURCHARGED*
S8.000	S105	20.309	1.009	0.000	1.45			36		6.9	FLOOD RISK
S8.001	S108	20.298	1.156	0.000	0.98			33		13.1	SURCHARGED
S8.002	SJT	19.033	0.000	0.000	1.82					22.6	SURCHARGED*

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

		Water	Surcharged	Flooded			Half Drain	Pipe	
	US/MH	Level	Depth	Volume	Flow /	Overflow	Time	Flow	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	Status
S8.003	S110	20.284	1.290	0.000	0.82			14.8	FLOOD RISK
S9.000	S114	20.281	0.681	0.000	0.31			5.5	FLOOD RISK
S4.007	S117	20.273	1.641	0.000	0.96		51	108.3	FLOOD RISK
S10.000	S126	20.314	0.484	0.000	4.26			18.1	FLOOD RISK
S4.008	SJT	19.802	1.253	0.000	1.22			171.7	SURCHARGED*
S11.000	S130	20.446	0.521	0.000	0.01			0.6	FLOOD RISK
S12.000	S129	20.500	0.670	0.399	1.35			12.2	FLOOD
S11.001	SJT	19.769	0.095	0.000	0.64			26.9	SURCHARGED*
S13.000	S135	20.500	0.680	0.060	0.80			10.4	FLOOD
S11.002	SJT	19.503	0.000	0.000	1.17			49.6	SURCHARGED*
S14.000	S139	20.500	0.670	0.162	1.36			13.9	FLOOD
S11.003	S140	20.277	0.972	0.000	0.90			34.4	FLOOD RISK
S15.000	S144	20.267	0.447	0.000	0.43			4.1	FLOOD RISK
S11.004	S145	20.263	1.085	0.000	1.19		34	42.0	FLOOD RISK
S4.009	S146	20.258	1.839	0.000	1.63			156.8	FLOOD RISK
S1.012	STank	20.241	1.866	0.000	0.28		133	64.0	FLOOD RISK

PN	US/MH Name	Level Exceeded
S4.002	S079	
S5.000	S092	5
S5.001	S094	
S4.003	S095	
S6.000	S058	3
S6.001	SJT	
S7.000	S069	
S4.004	S096	
S4.005	SJT	
S4.006	SJT	
S8.000	S105	
S8.001	S108	
S8.002	SJT	
S8.003	S110	
S9.000	S114	
S4.007	S117	
S10.000	S126	
S4.008	SJT	
S11.000	S130	
S12.000	S129	2
S11.001	SJT	
S13.000	S135	1
S11.002	SJT	
S14.000	S139	1
S11.003	S140	
S15.000	S144	

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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>		
	US/MH Level	
PN	Name Exceeded	
S11.004	S145	
S4.009	S146	
S1.012	STank	
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