

Rogers Cory Partnership		Page 0
The Old School Old School Road Hook Hampshire RG27 9NJ	Harbour Place Forty Acre Farm Bedhampton	
Date 12/05/2021	Designed by Terry Seymour	
File SW1-Replan.MDX	Checked by Anthony Cooper	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW1.SWS

Pipe Sizes SW1- windes export Manhole Sizes SW1- windes export

FSR Rainfall Model - England and Wales			
Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.100	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.100
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
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 SW1.SWS at outfall S14 (pipe S1.011)

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.076	4-8	2.577	8-12	1.880	12-16	0.037

Total Area Contributing (ha) = 4.571

Total Pipe Volume (m³) = 477.379

Time Area Diagram at outfall S14 (pipe S20.009)

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.095	4-8	0.814	8-12	0.301

Total Area Contributing (ha) = 1.210

Total Pipe Volume (m³) = 190.044

Network Design Table for SW1.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	19.218	0.961	20.0	0.012	5.00	0.0	0.600	0	225	Pipe/Conduit	
S1.001	21.741	1.087	20.0	0.093	0.00	0.0	0.600	0	225	Pipe/Conduit	
S1.002	15.995	0.800	20.0	0.033	0.00	0.0	0.600	0	225	Pipe/Conduit	
S2.000	55.101	2.755	20.0	0.249	5.00	0.0	0.600	0	375	Pipe/Conduit	
S2.001	55.447	0.534	103.8	0.227	0.00	0.0	0.600	0	375	Pipe/Conduit	
S2.002	19.666	0.047	418.4	0.005	0.00	0.0	0.600	0	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	I.Area (ha)	Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.11	7.513	0.012	0.0	0.0	0.0	2.94	116.9	1.6
S1.001	50.00	5.23	6.552	0.105	0.0	0.0	0.0	2.94	116.9	14.2
S1.002	50.00	5.32	5.465	0.138	0.0	0.0	0.0	2.94	116.9	18.7
S2.000	50.00	5.23	6.500	0.249	0.0	0.0	0.0	4.07	449.2	33.7
S2.001	50.00	5.75	3.745	0.476	0.0	0.0	0.0	1.78	196.4	64.5
S2.002	50.00	6.02	3.211	0.481	0.0	0.0	0.0	1.18	334.8	65.1

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PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.003	34.487	0.069	499.8	0.065	0.00	0.0	0.600	o	750	Pipe/Conduit	
S1.004	46.720	0.467	100.0	0.152	0.00	0.0	0.600	o	750	Pipe/Conduit	
S1.005	7.396	0.103	71.8	0.008	0.00	0.0	0.600	o	750	Pipe/Conduit	
S3.000	53.039	0.265	200.1	0.179	5.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	38.650	0.245	157.8	0.163	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.006	63.418	0.127	499.4	0.081	0.00	0.0	0.600	o	750	Pipe/Conduit	
S5.000	45.988	0.602	76.4	0.095	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	17.258	0.035	493.1	0.027	0.00	0.0	0.600	o	750	Pipe/Conduit	
S6.000	26.107	0.537	48.6	0.116	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.008	35.663	0.807	44.2	0.025	0.00	0.0	0.600	o	750	Pipe/Conduit	
S7.000	27.936	1.027	27.2	0.444	5.00	0.0	0.600	o	225	Pipe/Conduit	
S7.001	63.689	0.159	400.6	0.135	0.00	0.0	0.600	o	450	Pipe/Conduit	
S8.000	48.374	0.605	80.0	0.112	5.00	0.0	0.600	o	225	Pipe/Conduit	
S7.002	60.197	0.590	102.0	0.142	0.00	0.0	0.600	o	450	Pipe/Conduit	
S9.000	36.603	0.215	170.2	0.084	5.00	0.0	0.600	o	300	Pipe/Conduit	
S9.001	8.667	0.051	169.9	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)
S1.003	50.00	6.48	3.014	0.684	0.0	0.0	0.0	1.24	550.0	92.6
S1.004	50.00	6.76	2.945	0.836	0.0	0.0	0.0	2.80	1236.2	113.2
S1.005	50.00	6.80	2.478	0.844	0.0	0.0	0.0	3.31	1460.1	114.3
S3.000	50.00	5.80	3.090	0.179	0.0	0.0	0.0	1.11	78.3	24.2
S4.000	50.00	5.52	3.070	0.163	0.0	0.0	0.0	1.25	88.3	22.1
S1.006	50.00	7.65	2.375	1.267	0.0	0.0	0.0	1.25	550.2	171.6
S5.000	50.00	5.51	3.375	0.095	0.0	0.0	0.0	1.50	59.5	12.9
S1.007	50.00	7.88	2.248	1.389	0.0	0.0	0.0	1.25	553.7	188.1
S6.000	50.00	5.19	3.200	0.116	0.0	0.0	0.0	2.26	159.8	15.7
S1.008	50.00	8.02	2.213	1.530	0.0	0.0	0.0	4.22	1862.8	207.2
S7.000	50.00	5.18	3.972	0.444	0.0	0.0	0.0	2.52	100.1	60.1
S7.001	50.00	6.24	2.719	0.579	0.0	0.0	0.0	1.01	160.6	78.4
S8.000	50.00	5.55	3.390	0.112	0.0	0.0	0.0	1.46	58.2	15.2
S7.002	50.00	6.73	2.560	0.833	0.0	0.0	0.0	2.01	320.1	112.8
S9.000	50.00	5.51	2.842	0.084	0.0	0.0	0.0	1.20	85.0	11.4
S9.001	50.00	5.63	2.627	0.084	0.0	0.0	0.0	1.20	85.0	11.4

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Network Design Table for SW1.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S9.002	64.689	0.381	169.8	0.114	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.003	54.809	0.101	542.7	0.038	0.00	0.0	0.600	o	600	Pipe/Conduit	
S10.000	42.185	0.647	65.2	0.089	5.00	0.0	0.600	o	300	Pipe/Conduit	
S11.000	37.059	0.151	245.4	0.088	5.00	0.0	0.600	o	300	Pipe/Conduit	
S10.001	63.449	0.930	68.2	0.117	0.00	0.0	0.600	o	375	Pipe/Conduit	
S7.004	40.500	0.049	826.5	0.049	0.00	0.0	0.600	o	825	Pipe/Conduit	
S7.005	23.659	0.029	825.0	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
S7.006	19.722	0.024	825.0	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
S7.007	50.960	0.062	825.0	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
S12.000	35.778	0.304	117.7	0.104	5.00	0.0	0.600	o	300	Pipe/Conduit	
S12.001	30.485	0.543	56.1	0.096	0.00	0.0	0.600	o	300	Pipe/Conduit	
S13.000	37.748	0.369	102.3	0.217	5.00	0.0	0.600	o	300	Pipe/Conduit	
S14.000	15.428	0.908	17.0	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
S15.000	43.919	0.149	294.8	0.126	5.00	0.0	0.600	o	375	Pipe/Conduit	
S14.001	35.610	0.123	289.5	0.090	0.00	0.0	0.600	o	375	Pipe/Conduit	
S14.002	12.129	1.002	12.1	0.017	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.000	30.479	1.020	29.9	0.099	5.00	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)
S9.002	50.00	6.52	2.576	0.198	0.0	0.0	0.0	1.20	85.1	26.8
S7.003	50.00	7.61	1.820	1.069	0.0	0.0	0.0	1.04	293.6	144.8
S10.000	50.00	5.36	3.596	0.089	0.0	0.0	0.0	1.95	137.9	12.1
S11.000	50.00	5.62	3.100	0.088	0.0	0.0	0.0	1.00	70.6	11.9
S10.001	50.00	6.10	2.874	0.294	0.0	0.0	0.0	2.20	242.6	39.8
S7.004	50.00	8.27	1.494	1.412	0.0	0.0	0.0	1.02	547.7	191.2
S7.005	48.90	8.66	1.445	1.412	0.0	0.0	0.0	1.03	548.2	191.2
S7.006	48.03	8.98	1.416	1.412	0.0	0.0	0.0	1.03	548.2	191.2
S7.007	45.92	9.81	1.392	1.412	0.0	0.0	0.0	1.03	548.2	191.2
S12.000	50.00	5.41	3.687	0.104	0.0	0.0	0.0	1.45	102.4	14.1
S12.001	50.00	5.65	3.383	0.200	0.0	0.0	0.0	2.10	148.6	27.1
S13.000	50.00	5.40	3.210	0.217	0.0	0.0	0.0	1.55	109.9	29.4
S14.000	50.00	5.08	8.875	0.000	0.0	0.0	0.0	3.19	126.8	0.0
S15.000	50.00	5.70	6.364	0.126	0.0	0.0	0.0	1.05	116.0	17.1
S14.001	50.00	6.26	6.215	0.216	0.0	0.0	0.0	1.06	117.0	29.2
S14.002	50.00	6.30	6.092	0.233	0.0	0.0	0.0	5.23	577.9	31.6
S16.000	50.00	5.21	5.095	0.099	0.0	0.0	0.0	2.40	95.5	13.4

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PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S16.001	19.141	0.128	149.5	0.071	0.00	0.0	0.600	o	225	Pipe/Conduit	
S16.002	18.144	0.083	218.6	0.013	0.00	0.0	0.600	o	225	Pipe/Conduit	
S14.003	26.178	0.447	58.6	0.052	0.00	0.0	0.600	o	375	Pipe/Conduit	
S14.004	14.969	0.255	58.7	0.014	0.00	0.0	0.600	o	375	Pipe/Conduit	
S17.000	55.282	0.136	405.0	0.259	5.00	0.0	0.600	o	450	Pipe/Conduit	
S14.005	53.482	0.244	219.2	0.155	0.00	0.0	0.600	o	450	Pipe/Conduit	
S12.002	20.559	0.041	501.4	0.025	0.00	0.0	0.600	o	750	Pipe/Conduit	
S12.003	35.836	0.072	497.7	0.043	0.00	0.0	0.600	o	750	Pipe/Conduit	
S18.000	24.246	0.143	169.6	0.054	5.00	0.0	0.600	o	225	Pipe/Conduit	
S19.000	12.406	0.203	61.1	0.024	5.00	0.0	0.600	o	225	Pipe/Conduit	
S18.001	38.414	0.324	118.6	0.032	0.00	0.0	0.600	o	225	Pipe/Conduit	
S12.004	14.528	0.029	501.0	0.004	0.00	0.0	0.600	o	750	Pipe/Conduit	
S12.005	36.366	0.093	391.0	0.134	0.00	0.0	0.600	o	750	Pipe/Conduit	
S12.006	38.453	0.447	86.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S12.007	27.407	0.305	89.9	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S1.009	33.125	0.040	828.1	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
S1.010	83.161	0.101	823.4	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
S1.011	46.951	0.048	978.1	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	

Network Results Table

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S16.001	50.00	5.51	4.076	0.170	0.0	0.0	0.0	1.07	42.4	23.0
S16.002	50.00	5.85	3.945	0.183	0.0	0.0	0.0	0.88	35.0	24.8
S14.003	50.00	6.48	3.712	0.468	0.0	0.0	0.0	2.37	261.9	63.4
S14.004	50.00	6.58	3.265	0.482	0.0	0.0	0.0	2.37	261.6	65.3
S17.000	50.00	5.92	3.071	0.259	0.0	0.0	0.0	1.00	159.7	35.1
S14.005	50.00	7.24	2.935	0.896	0.0	0.0	0.0	1.37	217.8	121.3
S12.002	50.00	7.51	2.391	1.338	0.0	0.0	0.0	1.24	549.1	181.2
S12.003	50.00	7.99	2.350	1.381	0.0	0.0	0.0	1.25	551.1	187.0
S18.000	50.00	5.40	3.270	0.054	0.0	0.0	0.0	1.00	39.8	7.3
S19.000	50.00	5.12	3.330	0.024	0.0	0.0	0.0	1.68	66.6	3.2
S18.001	50.00	5.94	3.127	0.110	0.0	0.0	0.0	1.20	47.7	14.9
S12.004	50.00	8.19	2.278	1.495	0.0	0.0	0.0	1.24	549.3	202.4
S12.005	49.02	8.62	2.249	1.629	0.0	0.0	0.0	1.41	622.5	216.3
S12.006	48.43	8.83	2.156	1.629	0.0	0.0	0.0	3.02	1333.5	216.3
S12.007	48.01	8.98	1.709	1.629	0.0	0.0	0.0	2.95	1304.6	216.3
S1.009	44.72	10.32	1.330	4.571	0.0	0.0	0.0	1.08	687.5	553.6
S1.010	42.06	11.60	1.290	4.571	0.0	0.0	0.0	1.08	689.5	553.6
S1.011	40.62	12.38	1.189	4.571	0.0	0.0	0.0	0.99	632.0	553.6

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S20.000	19.949	0.246	81.1	0.067	5.00	0.0	0.600	o	150	Pipe/Conduit	
S20.001	59.110	0.344	171.8	0.121	0.00	0.0	0.600	o	225	Pipe/Conduit	
S21.000	50.643	0.102	496.5	0.152	5.00	0.0	0.600	o	450	Pipe/Conduit	
S20.002	28.439	0.041	693.6	0.103	0.00	0.0	0.600	o	750	Pipe/Conduit	
S20.003	62.842	0.090	700.0	0.177	0.00	0.0	0.600	o	750	Pipe/Conduit	
S22.000	30.631	0.183	167.4	0.058	5.00	0.0	0.600	o	225	Pipe/Conduit	
S20.004	27.056	0.039	700.0	0.044	0.00	0.0	0.600	o	750	Pipe/Conduit	
S23.000	52.214	0.240	217.6	0.151	5.00	0.0	0.600	o	225	Pipe/Conduit	
S20.005	61.499	0.120	512.5	0.142	0.00	0.0	0.600	o	750	Pipe/Conduit	
S24.000	23.330	0.521	44.8	0.097	5.00	0.0	0.600	o	225	Pipe/Conduit	
S20.006	12.730	0.020	636.5	0.023	0.00	0.0	0.600	o	750	Pipe/Conduit	
S25.000	13.857	0.083	167.0	0.075	5.00	0.0	0.600	o	225	Pipe/Conduit	
S20.007	20.312	0.041	495.4	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S20.008	38.098	0.076	501.3	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S20.009	144.044	0.561	256.7	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	

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S20.000	50.00	5.30	5.597	0.067	0.0	0.0	0.0	1.12	19.7	9.1
S20.001	50.00	6.29	5.276	0.188	0.0	0.0	0.0	0.99	39.5	25.5
S21.000	50.00	5.93	2.990	0.152	0.0	0.0	0.0	0.91	144.0	20.6
S20.002	50.00	6.74	2.304	0.443	0.0	0.0	0.0	1.05	466.0	60.0
S20.003	50.00	7.74	2.263	0.620	0.0	0.0	0.0	1.05	463.9	84.0
S22.000	50.00	5.51	3.700	0.058	0.0	0.0	0.0	1.01	40.1	7.9
S20.004	50.00	8.16	2.173	0.722	0.0	0.0	0.0	1.05	463.9	97.8
S23.000	50.00	5.99	3.699	0.151	0.0	0.0	0.0	0.88	35.1	20.4
S20.005	47.97	9.00	2.134	1.015	0.0	0.0	0.0	1.23	543.1	131.9
S24.000	50.00	5.20	3.060	0.097	0.0	0.0	0.0	1.96	77.9	13.1
S20.006	47.46	9.19	2.014	1.135	0.0	0.0	0.0	1.10	486.7	145.9
S25.000	50.00	5.23	3.700	0.075	0.0	0.0	0.0	1.01	40.1	10.2
S20.007	46.77	9.46	1.994	1.210	0.0	0.0	0.0	1.25	552.4	153.3
S20.008	45.52	9.97	1.778	1.210	0.0	0.0	0.0	1.24	549.2	153.3
S20.009	42.54	11.35	1.702	1.210	0.0	0.0	0.0	1.74	769.5	153.3

Free Flowing Outfall Details for SW1.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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S1.011	S14	2.300	1.141	1.141	825	0
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Free Flowing Outfall Details for SW1.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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S20.009	S14	2.300	1.141	1.141	825	0
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Simulation Criteria for SW1.SWS

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
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)	120
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	2

Number of Input Hydrographs	0	Number of Offline Controls	2	Number of Time/Area Diagrams	1
Number of Online Controls	2	Number of Storage Structures	5	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Storm Duration (mins)	60
Ratio R	0.350		

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Online Controls for SW1.SWS

Hydro-Brake® Optimum Manhole: S11, DS/PN: S1.010, Volume (m³): 27.8

Unit Reference MD-SHE-0157-1500-2191-1500
Design Head (m) 2.191
Design Flow (l/s) 15.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 157
Invert Level (m) 1.290
Minimum Outlet Pipe Diameter (mm) 225
Suggested Manhole Diameter (mm) 1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.191	15.0	Kick-Flo®	1.324	11.8
Flush-Flo™	0.639	15.0	Mean Flow over Head Range	-	13.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.6	0.800	14.9	2.000	14.4	4.000	20.0	7.000	26.1
0.200	12.2	1.000	14.3	2.200	15.0	4.500	21.1	7.500	27.0
0.300	13.6	1.200	13.2	2.400	15.7	5.000	22.2	8.000	27.9
0.400	14.4	1.400	12.1	2.600	16.3	5.500	23.3	8.500	28.7
0.500	14.8	1.600	12.9	3.000	17.4	6.000	24.3	9.000	29.5
0.600	15.0	1.800	13.7	3.500	18.7	6.500	25.2	9.500	30.3

Hydro-Brake® Optimum Manhole: S77, DS/PN: S20.007, Volume (m³): 11.7

Unit Reference MD-SHE-0090-5000-2191-5000
Design Head (m) 2.191
Design Flow (l/s) 5.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 90
Invert Level (m) 1.994
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.191	5.0	Kick-Flo®	0.798	3.1
Flush-Flo™	0.390	3.9	Mean Flow over Head Range	-	3.9

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	0.800	3.1	2.000	4.8	4.000	6.6	7.000	8.6
0.200	3.6	1.000	3.5	2.200	5.0	4.500	7.0	7.500	8.9
0.300	3.9	1.200	3.8	2.400	5.2	5.000	7.4	8.000	9.2
0.400	3.9	1.400	4.1	2.600	5.4	5.500	7.7	8.500	9.5
0.500	3.9	1.600	4.3	3.000	5.8	6.000	8.0	9.000	9.7
0.600	3.8	1.800	4.6	3.500	6.2	6.500	8.3	9.500	10.0

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Offline Controls for SW1.SWS

Pipe Manhole: S17, DS/PN: S7.000, Loop to PN: S9.000

Diameter (m)	0.225	Roughness k (mm)	0.600
Section Type	Pipe/Conduit	Entry Loss Coefficient	0.500
Slope (1:X)	24.1	Coefficient of Contraction	0.600
Length (m)	45.293	Upstream Invert Level (m)	4.717

Weir Manhole: S11, DS/PN: S1.010, Loop to PN: S1.011

Discharge Coef 0.544 Width (m) 0.042 Invert Level (m) 4.100

Storage Structures for SW1.SWS

Tank or Pond Manhole: S22, DS/PN: S7.005

Invert Level (m) 3.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	464.0	1.000	785.0	1.300	905.0

Tank or Pond Manhole: S54, DS/PN: S12.006

Invert Level (m) 3.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	357.0	1.000	705.0	1.300	822.0

Tank or Pond Manhole: S10, DS/PN: S1.009

Invert Level (m) 3.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	472.0	1.000	705.0	1.300	822.0

Tank or Pond Manhole: S11, DS/PN: S1.010

Invert Level (m) 3.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	426.0	1.000	957.0	1.300	1179.0

Tank or Pond Manhole: S77, DS/PN: S20.007

Invert Level (m) 3.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1788.0	1.000	2355.0	1.300	2459.0

Time Area Diagram at Pipe Number S7.000 for SW1.SWS

Total Area (ha) 0.444

Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)	
0 4 0.222		4 8 0.222	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

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 Offline Controls 2 Number of Time/Area Diagrams 1
 Number of Online Controls 2 Number of Storage Structures 5 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.100 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status 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, 100
 Climate Change (%) 0, 0, 50

US/MH			Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth
PN	Name	Storm							(m)	(m)
S1.000	S1	15 Winter	1	+0%					7.529	-0.209
S1.001	S2	15 Winter	1	+0%					6.601	-0.176
S1.002	S3	15 Winter	1	+0%					5.522	-0.168
S2.000	S38	15 Winter	1	+0%					6.568	-0.307
S2.001	S39	15 Winter	1	+0%	100/15 Summer				3.888	-0.232
S2.002	S40	15 Winter	1	+0%	30/30 Summer				3.404	-0.407
S1.003	S4	15 Winter	1	+0%	30/30 Summer				3.226	-0.538
S1.004	S5	360 Winter	1	+0%	30/30 Summer				3.211	-0.484
S1.005	S6	360 Winter	1	+0%	30/15 Summer				3.211	-0.017
S3.000	S34	360 Winter	1	+0%	30/15 Summer				3.210	-0.180
S4.000	S37	360 Winter	1	+0%	30/15 Summer				3.210	-0.160
S1.006	S7	360 Winter	1	+0%	1/60 Winter				3.210	0.085
S5.000	S8a	15 Winter	1	+0%	30/60 Winter				3.445	-0.155
S1.007	S8	360 Winter	1	+0%	1/30 Winter				3.210	0.212
S6.000	S9a	15 Winter	1	+0%	30/30 Summer				3.264	-0.236
S1.008	S9	360 Winter	1	+0%	1/30 Winter				3.209	0.246
S7.000	S17	15 Winter	1	+0%	30/15 Summer	100/15 Winter	100/15 Summer	9	4.082	-0.115
S7.001	S18	360 Winter	1	+0%	1/120 Winter				3.213	0.044
S8.000	S32	15 Winter	1	+0%	30/360 Winter				3.467	-0.148
S7.002	S19	360 Winter	1	+0%	1/30 Winter				3.211	0.201
S9.000	S24	360 Winter	1	+0%	1/120 Summer	100/15 Winter			3.210	0.068
S9.001	S25	360 Winter	1	+0%	1/30 Winter				3.210	0.283
S9.002	S26	360 Winter	1	+0%	1/30 Summer				3.210	0.334
S7.003	S20	360 Winter	1	+0%	1/15 Summer				3.210	0.790
S10.000	S27	15 Winter	1	+0%	100/120 Summer				3.656	-0.240
S11.000	S31	360 Winter	1	+0%	30/60 Winter				3.209	-0.191
S10.001	S28	360 Winter	1	+0%	30/30 Summer				3.209	-0.040
S7.004	S29	360 Winter	1	+0%	1/15 Summer				3.209	0.890
S7.005	S22	360 Winter	1	+0%	1/15 Summer				3.209	0.939
S7.006	S36	360 Winter	1	+0%	1/15 Summer				3.209	0.968
S7.007	S23	360 Winter	1	+0%	1/15 Summer				3.209	0.992
S12.000	S64	15 Winter	1	+0%	100/15 Summer				3.762	-0.225
S12.001	S65	15 Winter	1	+0%	100/15 Summer				3.467	-0.216

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Cap.			Time (mins)	Flow (l/s)		
S1.000	S1	0.000	0.01				1.5	OK	
S1.001	S2	0.000	0.11				11.5	OK	
S1.002	S3	0.000	0.14				15.0	OK	
S2.000	S38	0.000	0.08				31.5	OK	
S2.001	S39	0.000	0.30				55.5	OK	
S2.002	S40	0.000	0.23				55.5	OK	
S1.003	S4	0.000	0.17				76.5	OK	
S1.004	S5	0.000	0.02				18.2	OK	
S1.005	S6	0.000	0.03				16.8	OK	
S3.000	S34	0.000	0.05				3.9	OK	
S4.000	S37	0.000	0.04				3.6	OK	
S1.006	S7	0.000	0.05				25.0	SURCHARGED	
S5.000	S8a	0.000	0.21				12.0	OK	
S1.007	S8	0.000	0.09				26.8	SURCHARGED	
S6.000	S9a	0.000	0.10				14.7	OK	
S1.008	S9	0.000	0.02				29.3	SURCHARGED	
S7.000	S17	0.000	0.48		0.0		44.6	OK	3
S7.001	S18	0.000	0.08				12.1	SURCHARGED	
S8.000	S32	0.000	0.25				14.1	OK	
S7.002	S19	0.000	0.05				16.2	SURCHARGED	
S9.000	S24	0.000	0.02				1.8	SURCHARGED	3
S9.001	S25	0.000	0.10				6.3	SURCHARGED	
S9.002	S26	0.000	0.05				3.9	SURCHARGED	
S7.003	S20	0.000	0.08				20.3	SURCHARGED	
S10.000	S27	0.000	0.09				11.1	OK	
S11.000	S31	0.000	0.03				1.9	OK	
S10.001	S28	0.000	0.03				7.4	OK	
S7.004	S29	0.000	0.06				26.1	SURCHARGED	
S7.005	S22	0.000	0.05				14.2	SURCHARGED	
S7.006	S36	0.000	0.05				13.3	SURCHARGED	
S7.007	S23	0.000	0.03				12.3	SURCHARGED	
S12.000	S64	0.000	0.14				13.0	OK	
S12.001	S65	0.000	0.17				23.3	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

										Water	Surcharged
US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow		Level	Depth
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.		(m)	(m)
S13.000	S49a	15 Winter	1	+0%	30/30 Summer					3.316	-0.194
S14.000	S42	15 Summer	1	+0%						8.875	-0.225
S15.000	S59	15 Winter	1	+0%						6.461	-0.278
S14.001	S43	15 Winter	1	+0%	100/15 Summer					6.338	-0.252
S14.002	S44	15 Winter	1	+0%						6.155	-0.312
S16.000	S46	15 Winter	1	+0%	100/15 Summer					5.151	-0.169
S16.001	S47	15 Winter	1	+0%	30/15 Summer	100/15 Summer				4.193	-0.108
S16.002	S45a	15 Winter	1	+0%	30/15 Summer					4.081	-0.089
S14.003	S45	15 Winter	1	+0%	100/15 Summer					3.834	-0.253
S14.004	S81	15 Winter	1	+0%	30/15 Winter					3.398	-0.242
S17.000	S55	15 Winter	1	+0%	30/15 Summer					3.227	-0.294
S14.005	S48	360 Winter	1	+0%	30/15 Summer					3.214	-0.171
S12.002	S49	360 Winter	1	+0%	1/60 Winter					3.212	0.071
S12.003	S50	360 Winter	1	+0%	1/60 Summer					3.211	0.111
S18.000	S56b	15 Winter	1	+0%	30/60 Winter					3.336	-0.159
S19.000	S56a	15 Winter	1	+0%	30/120 Winter					3.363	-0.192
S18.001	S56	360 Winter	1	+0%	30/30 Summer					3.212	-0.140
S12.004	S51	360 Winter	1	+0%	1/30 Winter					3.211	0.183
S12.005	S52	360 Winter	1	+0%	1/30 Winter					3.211	0.212
S12.006	S54	360 Winter	1	+0%	1/30 Summer					3.210	0.304
S12.007	S62	360 Winter	1	+0%	1/15 Summer					3.210	0.751
S1.009	S10	360 Winter	1	+0%	1/15 Summer					3.209	0.979
S1.010	S11	360 Winter	1	+0%	1/15 Summer		100/240 Winter	12		3.208	1.018
S1.011	S12	1440 Winter	1	+0%						1.307	-0.782
S20.000	S66	15 Winter	1	+0%	30/15 Summer	100/15 Summer				5.669	-0.078
S20.001	S67	15 Winter	1	+0%	30/15 Summer	100/15 Summer				5.398	-0.103
S21.000	S80	360 Winter	1	+0%	100/30 Summer					3.128	-0.312
S20.002	S69	360 Winter	1	+0%	1/60 Winter					3.128	0.074
S20.003	S70	360 Winter	1	+0%	1/60 Summer					3.127	0.114
S22.000	S83	15 Winter	1	+0%						3.768	-0.157
S20.004	S73	360 Winter	1	+0%	1/60 Summer					3.127	0.204
S23.000	S82	15 Winter	1	+0%	30/15 Summer					3.822	-0.102
S20.005	S74	360 Winter	1	+0%	1/60 Summer					3.128	0.244
S24.000	S84a	360 Winter	1	+0%	100/15 Summer					3.128	-0.157
S20.006	S76	360 Winter	1	+0%	1/30 Summer					3.128	0.364
S25.000	S84	15 Winter	1	+0%	100/15 Summer					3.780	-0.145
S20.007	S77	360 Winter	1	+0%	1/30 Summer					3.127	0.383
S20.008	S78	720 Winter	1	+0%						1.814	-0.714
S20.009	S79	1440 Winter	1	+0%						1.721	-0.731

Flooded				Half Drain		Pipe		
	US/MH	Volume	Flow /	Overflow	Time	Flow	Level	
PN	Name	(m³)	Cap.	(l/s)	(mins)	(l/s)	Exceeded	
S13.000	S49a	0.000	0.27			27.3	OK	
S14.000	S42	0.000	0.00			0.0	OK	
S15.000	S59	0.000	0.15			15.6	OK	
S14.001	S43	0.000	0.23			24.5	OK	
S14.002	S44	0.000	0.07			26.2	OK	
S16.000	S46	0.000	0.14			12.5	OK	
S16.001	S47	0.000	0.52			20.1	OK	
S16.002	S45a	0.000	0.68			21.4	OK	
S14.003	S45	0.000	0.23			52.5	OK	
S14.004	S81	0.000	0.27			54.0	OK	
S17.000	S55	0.000	0.21			31.1	OK	
S14.005	S48	0.000	0.10			19.5	OK	
S12.002	S49	0.000	0.08			26.8	SURCHARGED	
S12.003	S50	0.000	0.06			27.2	SURCHARGED	
S18.000	S56b	0.000	0.18			6.7	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Pipe		Status	Level Exceeded
		Volume (m³)	Flow			Time (mins)	Flow (l/s)		
S19.000	S56a	0.000	0.05				3.0	OK	
S18.001	S56	0.000	0.05				2.4	OK	
S12.004	S51	0.000	0.11				29.0	SURCHARGED	
S12.005	S52	0.000	0.06				31.4	SURCHARGED	
S12.006	S54	0.000	0.02				25.0	SURCHARGED	
S12.007	S62	0.000	0.02				20.9	SURCHARGED	
S1.009	S10	0.000	0.07				33.6	SURCHARGED	
S1.010	S11	0.000	0.02		0.0		15.0	SURCHARGED	
S1.011	S12	0.000	0.03				15.0	OK	
S20.000	S66	0.000	0.45				8.3	OK	4
S20.001	S67	0.000	0.56				21.3	OK	3
S21.000	S80	0.000	0.03				3.3	OK	
S20.002	S69	0.000	0.03				9.0	SURCHARGED	
S20.003	S70	0.000	0.03				11.0	SURCHARGED	
S22.000	S83	0.000	0.20				7.3	OK	
S20.004	S73	0.000	0.04				12.8	SURCHARGED	
S23.000	S82	0.000	0.57				19.1	OK	
S20.005	S74	0.000	0.04				18.0	SURCHARGED	
S24.000	S84a	0.000	0.03				2.1	OK	
S20.006	S76	0.000	0.10				20.0	SURCHARGED	
S25.000	S84	0.000	0.27				9.5	OK	
S20.007	S77	0.000	0.01				3.9	SURCHARGED	
S20.008	S78	0.000	0.01				3.9	OK	
S20.009	S79	0.000	0.01				3.9	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

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 Offline Controls 2 Number of Time/Area Diagrams 1
 Number of Online Controls 2 Number of Storage Structures 5 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.100 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s)

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 50

										Water	Surcharged
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	
S1.000	S1	15 Winter	30	+0%					7.540	-0.198	
S1.001	S2	15 Winter	30	+0%					6.640	-0.137	
S1.002	S3	15 Winter	30	+0%					5.570	-0.120	
S2.000	S38	15 Winter	30	+0%					6.609	-0.266	
S2.001	S39	15 Winter	30	+0%	100/15 Summer				4.009	-0.111	
S2.002	S40	120 Winter	30	+0%	30/30 Summer				3.881	0.070	
S1.003	S4	120 Winter	30	+0%	30/30 Summer				3.874	0.110	
S1.004	S5	120 Winter	30	+0%	30/30 Summer				3.867	0.172	
S1.005	S6	180 Winter	30	+0%	30/15 Summer				3.730	0.502	
S3.000	S34	180 Winter	30	+0%	30/15 Summer				3.740	0.350	
S4.000	S37	180 Winter	30	+0%	30/15 Summer				3.737	0.367	
S1.006	S7	180 Winter	30	+0%	1/60 Winter				3.727	0.602	
S5.000	S8a	180 Winter	30	+0%	30/60 Winter				3.730	0.130	
S1.007	S8	180 Winter	30	+0%	1/30 Winter				3.716	0.718	
S6.000	S9a	180 Winter	30	+0%	30/30 Summer				3.715	0.215	
S1.008	S9	180 Winter	30	+0%	1/30 Winter				3.708	0.745	
S7.000	S17	15 Winter	30	+0%	30/15 Summer	100/15 Winter	100/15 Summer	9	4.506	0.309	
S7.001	S18	600 Winter	30	+0%	1/120 Winter				3.663	0.494	
S8.000	S32	600 Winter	30	+0%	30/360 Winter				3.663	0.048	
S7.002	S19	720 Winter	30	+0%	1/30 Winter				3.662	0.652	
S9.000	S24	720 Winter	30	+0%	1/120 Summer	100/15 Winter			3.661	0.519	
S9.001	S25	720 Winter	30	+0%	1/30 Winter				3.661	0.734	
S9.002	S26	720 Winter	30	+0%	1/30 Summer				3.661	0.785	
S7.003	S20	720 Winter	30	+0%	1/15 Summer				3.660	1.240	
S10.000	S27	15 Winter	30	+0%	100/120 Summer				3.690	-0.206	
S11.000	S31	720 Winter	30	+0%	30/60 Winter				3.659	0.259	
S10.001	S28	720 Winter	30	+0%	30/30 Summer				3.659	0.410	
S7.004	S29	720 Winter	30	+0%	1/15 Summer				3.659	1.340	
S7.005	S22	720 Winter	30	+0%	1/15 Summer				3.659	1.389	
S7.006	S36	720 Winter	30	+0%	1/15 Summer				3.659	1.418	
S7.007	S23	720 Winter	30	+0%	1/15 Summer				3.658	1.441	
S12.000	S64	15 Winter	30	+0%	100/15 Summer				3.809	-0.178	
S12.001	S65	600 Winter	30	+0%	100/15 Summer				3.663	-0.020	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flooded		Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m ³)	Flow / Cap.					
S1.000	S1	0.000	0.04			3.7	OK	
S1.001	S2	0.000	0.33			34.7	OK	
S1.002	S3	0.000	0.44			45.6	OK	
S2.000	S38	0.000	0.19			77.4	OK	
S2.001	S39	0.000	0.81			147.8	OK	
S2.002	S40	0.000	0.21			50.2	SURCHARGED	
S1.003	S4	0.000	0.16			68.2	SURCHARGED	
S1.004	S5	0.000	0.08			80.8	SURCHARGED	
S1.005	S6	0.000	0.10			58.9	SURCHARGED	
S3.000	S34	0.000	0.18			13.4	SURCHARGED	
S4.000	S37	0.000	0.15			12.3	SURCHARGED	
S1.006	S7	0.000	0.19			88.9	SURCHARGED	
S5.000	S8a	0.000	0.12			7.1	SURCHARGED	
S1.007	S8	0.000	0.31			97.1	SURCHARGED	
S6.000	S9a	0.000	0.06			8.7	SURCHARGED	
S1.008	S9	0.000	0.08			106.7	SURCHARGED	
S7.000	S17	0.000	1.08	0.0		100.2	SURCHARGED	3
S7.001	S18	0.000	0.13			18.7	SURCHARGED	
S8.000	S32	0.000	0.07			3.7	SURCHARGED	
S7.002	S19	0.000	0.08			23.3	SURCHARGED	
S9.000	S24	0.000	0.03			2.3	SURCHARGED	3
S9.001	S25	0.000	0.04			2.2	SURCHARGED	
S9.002	S26	0.000	0.07			5.4	SURCHARGED	
S7.003	S20	0.000	0.11			29.6	SURCHARGED	
S10.000	S27	0.000	0.21			27.3	OK	
S11.000	S31	0.000	0.04			2.4	SURCHARGED	
S10.001	S28	0.000	0.03			7.9	SURCHARGED	
S7.004	S29	0.000	0.09			38.6	SURCHARGED	
S7.005	S22	0.000	0.04			10.9	SURCHARGED	
S7.006	S36	0.000	0.04			10.7	SURCHARGED	
S7.007	S23	0.000	0.02			10.6	SURCHARGED	
S12.000	S64	0.000	0.34			31.7	OK	
S12.001	S65	0.000	0.05			6.6	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

Water Surcharged										
US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)
S13.000	S49a	600 Winter	30	+0%	30/30 Summer				3.663	0.153
S14.000	S42	15 Summer	30	+0%					8.875	-0.225
S15.000	S59	15 Winter	30	+0%					6.522	-0.217
S14.001	S43	15 Winter	30	+0%	100/15 Summer				6.430	-0.160
S14.002	S44	15 Winter	30	+0%					6.198	-0.269
S16.000	S46	15 Winter	30	+0%	100/15 Summer				5.187	-0.133
S16.001	S47	15 Winter	30	+0%	30/15 Summer	100/15 Summer			4.562	0.261
S16.002	S45a	15 Winter	30	+0%	30/15 Summer				4.326	0.156
S14.003	S45	30 Summer	30	+0%	100/15 Summer				3.945	-0.142
S14.004	S81	30 Summer	30	+0%	30/15 Winter				3.887	0.247
S17.000	S55	30 Summer	30	+0%	30/15 Summer				3.749	0.228
S14.005	S48	120 Winter	30	+0%	30/15 Summer				3.687	0.302
S12.002	S49	600 Winter	30	+0%	1/60 Winter				3.662	0.521
S12.003	S50	720 Winter	30	+0%	1/60 Summer				3.662	0.562
S18.000	S56b	600 Winter	30	+0%	30/60 Winter				3.663	0.168
S19.000	S56a	720 Winter	30	+0%	30/120 Winter				3.662	0.107
S18.001	S56	720 Winter	30	+0%	30/30 Summer				3.662	0.310
S12.004	S51	720 Winter	30	+0%	1/30 Winter				3.661	0.633
S12.005	S52	720 Winter	30	+0%	1/30 Winter				3.661	0.662
S12.006	S54	720 Winter	30	+0%	1/30 Summer				3.660	0.754
S12.007	S62	720 Winter	30	+0%	1/15 Summer				3.659	1.200
S1.009	S10	720 Winter	30	+0%	1/15 Summer				3.658	1.428
S1.010	S11	720 Winter	30	+0%	1/15 Summer		100/240 Winter	12	3.657	1.467
S1.011	S12	720 Winter	30	+0%					1.308	-0.781
S20.000	S66	15 Winter	30	+0%	30/15 Summer	100/15 Summer			6.033	0.286
S20.001	S67	15 Winter	30	+0%	30/15 Summer	100/15 Summer			5.785	0.284
S21.000	S80	15 Winter	30	+0%	100/30 Summer				3.317	-0.123
S20.002	S69	720 Winter	30	+0%	1/60 Winter				3.278	0.224
S20.003	S70	30 Summer	30	+0%	1/60 Summer				3.305	0.292
S22.000	S83	15 Winter	30	+0%					3.811	-0.114
S20.004	S73	720 Winter	30	+0%	1/60 Summer				3.278	0.355
S23.000	S82	15 Winter	30	+0%	30/15 Summer				4.100	0.176
S20.005	S74	720 Winter	30	+0%	1/60 Summer				3.278	0.394
S24.000	S84a	720 Winter	30	+0%	100/15 Summer				3.278	-0.007
S20.006	S76	720 Winter	30	+0%	1/30 Summer				3.278	0.514
S25.000	S84	15 Winter	30	+0%	100/15 Summer				3.836	-0.089
S20.007	S77	720 Winter	30	+0%	1/30 Summer				3.277	0.533
S20.008	S78	600 Winter	30	+0%					1.814	-0.714
S20.009	S79	960 Summer	30	+0%					1.721	-0.731

Flooded				Half Drain		Pipe	Level	
PN	US/MH	Volume	Flow /	Overflow	Time	Flow	Status	Exceeded
	Name	(m³)	Cap.	(l/s)	(mins)	(l/s)		
S13.000	S49a	0.000	0.07			6.8	SURCHARGED	
S14.000	S42	0.000	0.00			0.0	OK	
S15.000	S59	0.000	0.36			38.2	OK	
S14.001	S43	0.000	0.61			64.1	OK	
S14.002	S44	0.000	0.17			68.5	OK	
S16.000	S46	0.000	0.34			30.8	OK	
S16.001	S47	0.000	1.34			51.1	SURCHARGED	4
S16.002	S45a	0.000	1.72			54.0	SURCHARGED	
S14.003	S45	0.000	0.53			121.1	OK	
S14.004	S81	0.000	0.64			125.9	SURCHARGED	
S17.000	S55	0.000	0.44			65.1	SURCHARGED	
S14.005	S48	0.000	0.44			88.0	SURCHARGED	
S12.002	S49	0.000	0.12			42.0	SURCHARGED	
S12.003	S50	0.000	0.09			38.5	SURCHARGED	
S18.000	S56b	0.000	0.05			1.7	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flooded		Flow / Cap.	Overflow (l/s)	Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m ³)	Flow / Cap.			Time (mins)	Flow (l/s)			
S19.000	S56a	0.000	0.01				0.7	SURCHARGED		
S18.001	S56	0.000	0.06				2.7	SURCHARGED		
S12.004	S51	0.000	0.15				41.1	SURCHARGED		
S12.005	S52	0.000	0.09				44.8	SURCHARGED		
S12.006	S54	0.000	0.02				22.0	SURCHARGED		
S12.007	S62	0.000	0.03				21.9	SURCHARGED		
S1.009	S10	0.000	0.09				43.0	SURCHARGED		
S1.010	S11	0.000	0.03		0.0		15.5	SURCHARGED		
S1.011	S12	0.000	0.03				15.5	OK		
S20.000	S66	0.000	1.03				19.2	SURCHARGED		4
S20.001	S67	0.000	1.36				51.9	SURCHARGED		3
S21.000	S80	0.000	0.36				47.0	OK		
S20.002	S69	0.000	0.04				12.2	SURCHARGED		
S20.003	S70	0.000	0.28				113.2	SURCHARGED		
S22.000	S83	0.000	0.48				17.9	OK		
S20.004	S73	0.000	0.07				20.1	SURCHARGED		
S23.000	S82	0.000	1.33				44.9	SURCHARGED		
S20.005	S74	0.000	0.06				28.4	SURCHARGED		
S24.000	S84a	0.000	0.04				2.7	OK		
S20.006	S76	0.000	0.15				31.8	SURCHARGED		
S25.000	S84	0.000	0.66				23.2	OK		
S20.007	S77	0.000	0.01				3.9	SURCHARGED		
S20.008	S78	0.000	0.01				3.9	OK		
S20.009	S79	0.000	0.01				3.9	OK		

Rogers Cory Partnership		Page 17
The Old School Old School Road Hook Hampshire RG27 9NJ	Harbour Place Forty Acre Farm Bedhampton	
Date 12/05/2021	Designed by Terry Seymour	
File SW1-Replan.MDX	Checked by Anthony Cooper	
Innovyze	Network 2020.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

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 Offline Controls 2 Number of Time/Area Diagrams 1
 Number of Online Controls 2 Number of Storage Structures 5 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.100 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status 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, 100
 Climate Change (%) 0, 0, 50

50% Climate Change allowance shown within 100 year storm events is to simulate 100yr + 40%CC +10% urban creep storm events.

										Water	Surcharged
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	
S1.000	S1	15 Winter	100	+50%					7.552	-0.186	
S1.001	S2	15 Winter	100	+50%					6.682	-0.095	
S1.002	S3	15 Winter	100	+50%					5.626	-0.064	
S2.000	S38	15 Winter	100	+50%					6.656	-0.219	
S2.001	S39	15 Winter	100	+50%	100/15 Summer				5.349	1.229	
S2.002	S40	240 Winter	100	+50%	30/30 Summer				4.455	0.644	
S1.003	S4	240 Winter	100	+50%	30/30 Summer				4.448	0.684	
S1.004	S5	240 Winter	100	+50%	30/30 Summer				4.441	0.746	
S1.005	S6	360 Winter	100	+50%	30/15 Summer				4.309	1.081	
S3.000	S34	360 Winter	100	+50%	30/15 Summer				4.320	0.930	
S4.000	S37	360 Winter	100	+50%	30/15 Summer				4.317	0.947	
S1.006	S7	360 Winter	100	+50%	1/60 Winter				4.306	1.181	
S5.000	S8a	360 Winter	100	+50%	30/60 Winter				4.309	0.709	
S1.007	S8	960 Winter	100	+50%	1/30 Winter				4.302	1.304	
S6.000	S9a	960 Winter	100	+50%	30/30 Summer				4.302	0.802	
S1.008	S9	960 Winter	100	+50%	1/30 Winter				4.301	1.338	
S7.000	S17	15 Winter	100	+50%	30/15 Summer	100/15 Winter	100/15 Summer	9	5.546	1.349	
S7.001	S18	960 Winter	100	+50%	1/120 Winter				4.308	1.139	
S8.000	S32	15 Winter	100	+50%	30/360 Winter				4.557	0.942	
S7.002	S19	960 Winter	100	+50%	1/30 Winter				4.306	1.296	
S9.000	S24	30 Winter	100	+50%	1/120 Summer	100/15 Winter			4.816	1.674	
S9.001	S25	30 Winter	100	+50%	1/30 Winter				4.626	1.699	
S9.002	S26	30 Winter	100	+50%	1/30 Summer				4.531	1.655	
S7.003	S20	960 Winter	100	+50%	1/15 Summer				4.303	1.883	
S10.000	S27	960 Winter	100	+50%	100/120 Summer				4.303	0.407	
S11.000	S31	960 Winter	100	+50%	30/60 Winter				4.303	0.903	
S10.001	S28	960 Winter	100	+50%	30/30 Summer				4.303	1.054	
S7.004	S29	960 Winter	100	+50%	1/15 Summer				4.302	1.983	
S7.005	S22	960 Winter	100	+50%	1/15 Summer				4.301	2.031	
S7.006	S36	960 Winter	100	+50%	1/15 Summer				4.300	2.059	
S7.007	S23	960 Winter	100	+50%	1/15 Summer				4.300	2.083	
S12.000	S64	960 Winter	100	+50%	100/15 Summer				4.308	0.321	
S12.001	S65	960 Winter	100	+50%	100/15 Summer				4.307	0.624	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Pipe		Status	Level Exceeded
		Volume (m ³)	Flow			Time (mins)	Flow (l/s)		
S1.000	S1	0.000	0.07				7.2	OK	
S1.001	S2	0.000	0.63				67.3	OK	
S1.002	S3	0.000	0.86				88.5	OK	
S2.000	S38	0.000	0.36				150.4	OK	
S2.001	S39	0.000	1.40				256.8	SURCHARGED	
S2.002	S40	0.000	0.24				59.2	SURCHARGED	
S1.003	S4	0.000	0.19				84.3	SURCHARGED	
S1.004	S5	0.000	0.10				102.6	SURCHARGED	
S1.005	S6	0.000	0.13				76.1	SURCHARGED	
S3.000	S34	0.000	0.22				16.1	FLOOD RISK	
S4.000	S37	0.000	0.18				14.7	FLOOD RISK	
S1.006	S7	0.000	0.24				113.9	SURCHARGED	
S5.000	S8a	0.000	0.15				8.5	SURCHARGED	Localised flooded volumes of 4.167m ³ during peak 100yr + 40% CC (+10% urban creep) storm event will be contained within development kerbs and will re-enter the network via road gullies located further downstream.
S1.007	S8	0.000	0.19				58.3	SURCHARGED	
S6.000	S9a	0.000	0.03				4.9	FLOOD RISK	
S1.008	S9	0.000	0.05				64.1	FLOOD RISK	3 Localised flooded volumes of 2.369m ³ during peak 100yr + 40% CC (+10% urban creep) storm event will be contained within development kerbs and will re-enter the network via road gullies located further downstream.
S7.000	S17	4.167	1.26		66.8		117.7	FLOOD	
S7.001	S18	0.000	0.17				25.2	SURCHARGED	
S8.000	S32	0.000	0.97				54.0	SURCHARGED	
S7.002	S19	0.000	0.12				36.0	SURCHARGED	
S9.000	S24	2.369	1.12				87.5	FLOOD	
S9.001	S25	0.000	1.44				88.6	SURCHARGED	
S9.002	S26	0.000	1.53				124.6	SURCHARGED	
S7.003	S20	0.000	0.18				45.9	SURCHARGED	
S10.000	S27	0.000	0.03				3.7	SURCHARGED	
S11.000	S31	0.000	0.06				3.7	FLOOD RISK	
S10.001	S28	0.000	0.05				12.3	FLOOD RISK	
S7.004	S29	0.000	0.14				60.2	SURCHARGED	
S7.005	S22	0.000	0.05				15.3	FLOOD RISK	
S7.006	S36	0.000	0.06				15.2	FLOOD RISK	
S7.007	S23	0.000	0.03				15.0	FLOOD RISK	
S12.000	S64	0.000	0.05				4.4	SURCHARGED	
S12.001	S65	0.000	0.06				8.4	FLOOD RISK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S13.000	S49a	960 Winter	100	+50%	30/30 Summer				4.308	0.798
S14.000	S42	15 Summer	100	+50%					8.875	-0.225
S15.000	S59	15 Winter	100	+50%					6.687	-0.052
S14.001	S43	15 Winter	100	+50%	100/15 Summer				6.613	0.023
S14.002	S44	15 Winter	100	+50%					6.240	-0.227
S16.000	S46	15 Winter	100	+50%	100/15 Summer				6.263	0.943
S16.001	S47	15 Winter	100	+50%	30/15 Summer	100/15 Summer			5.909	1.608
S16.002	S45a	15 Winter	100	+50%	30/15 Summer				5.669	1.499
S14.003	S45	15 Winter	100	+50%	100/15 Summer				5.393	1.306
S14.004	S81	15 Winter	100	+50%	30/15 Winter				5.060	1.420
S17.000	S55	15 Winter	100	+50%	30/15 Summer				4.870	1.349
S14.005	S48	15 Winter	100	+50%	30/15 Summer				4.787	1.402
S12.002	S49	960 Winter	100	+50%	1/60 Winter				4.306	1.165
S12.003	S50	960 Winter	100	+50%	1/60 Summer				4.305	1.205
S18.000	S56b	960 Winter	100	+50%	30/60 Winter				4.306	0.811
S19.000	S56a	960 Winter	100	+50%	30/120 Winter				4.306	0.751
S18.001	S56	960 Winter	100	+50%	30/30 Summer				4.306	0.954
S12.004	S51	960 Winter	100	+50%	1/30 Winter				4.304	1.276
S12.005	S52	960 Winter	100	+50%	1/30 Winter				4.303	1.304
S12.006	S54	960 Winter	100	+50%	1/30 Summer				4.302	1.396
S12.007	S62	960 Winter	100	+50%	1/15 Summer				4.301	1.842
S1.009	S10	960 Winter	100	+50%	1/15 Summer				4.300	2.070
S1.010	S11	960 Winter	100	+50%	1/15 Summer		100/240 Winter	12	4.298	2.108
S1.011	S12	960 Winter	100	+50%					1.328	-0.761
S20.000	S66	15 Winter	100	+50%	30/15 Summer	100/15 Summer			6.901	1.154
S20.001	S67	15 Winter	100	+50%	30/15 Summer	100/15 Summer			6.611	1.110
S21.000	S80	1440 Winter	100	+50%	100/30 Summer				3.561	0.121
S20.002	S69	15 Winter	100	+50%	1/60 Winter				3.564	0.510
S20.003	S70	1440 Winter	100	+50%	1/60 Summer				3.561	0.548
S22.000	S83	15 Winter	100	+50%					3.873	-0.052
S20.004	S73	1440 Winter	100	+50%	1/60 Summer				3.561	0.638
S23.000	S82	15 Winter	100	+50%	30/15 Summer				5.117	1.193
S20.005	S74	1440 Winter	100	+50%	1/60 Summer				3.561	0.677
S24.000	S84a	1440 Winter	100	+50%	100/15 Summer				3.562	0.277
S20.006	S76	1440 Winter	100	+50%	1/30 Summer				3.561	0.797
S25.000	S84	15 Winter	100	+50%	100/15 Summer				3.975	0.050
S20.007	S77	1440 Winter	100	+50%	1/30 Summer				3.561	0.817
S20.008	S78	1440 Winter	100	+50%					1.818	-0.710
S20.009	S79	1440 Winter	100	+50%					1.723	-0.729

PN	US/MH Name	Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow (l/s)						
S13.000	S49a	0.000	0.09				9.3	SURCHARGED	
S14.000	S42	0.000	0.00				0.0	OK	
S15.000	S59	0.000	0.68				72.1	OK	
S14.001	S43	0.000	1.12				117.7	SURCHARGED	
S14.002	S44	0.000	0.32				127.0	OK	
S16.000	S46	0.000	0.55				49.5	FLOOD RISK	
S16.001	S47	2.921	1.88				72.1	FLOOD	4 Localised flooded volumes of 2.921m³ during peak 100yr + 40% CC (+10% urban creep) storm event will be contained within development kerbs and will re-enter the network via road gullies located further downstream.
S16.002	S45a	0.000	2.43				76.2	SURCHARGED	
S14.003	S45	0.000	0.91				206.9	SURCHARGED	
S14.004	S81	0.000	1.07				210.9	SURCHARGED	
S17.000	S55	0.000	0.86				125.3	FLOOD RISK	
S14.005	S48	0.000	1.98				393.2	SURCHARGED	
S12.002	S49	0.000	0.16				56.7	SURCHARGED	
S12.003	S50	0.000	0.13				58.4	SURCHARGED	
S18.000	S56b	0.000	0.06				2.2	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Flooded		Flow / Cap.	Overflow (l/s)	Half Drain		Pipe	Status	Level Exceeded
		Volume (m³)	Flow			Time (mins)	Flow (l/s)			
S19.000	S56a	0.000	0.02				1.0	SURCHARGED		
S18.001	S56	0.000	0.10				4.5	SURCHARGED		
S12.004	S51	0.000	0.23				62.9	SURCHARGED		
S12.005	S52	0.000	0.14				68.5	SURCHARGED		
S12.006	S54	0.000	0.03				30.3	FLOOD RISK		
S12.007	S62	0.000	0.03				30.2	FLOOD RISK		
S1.009	S10	0.000	0.14				66.5	FLOOD RISK		
S1.010	S11	0.000	0.03		6.3		17.3	FLOOD RISK		
S1.011	S12	0.000	0.05				23.6	OK		
S20.000	S66	3.139	1.98				36.8	FLOOD	4	Localised flooded volumes of
S20.001	S67	1.532	2.06				78.7	FLOOD	3	3.139m³ & 1.532m³ during peak
S21.000	S80	0.000	0.04				4.8	SURCHARGED		100yr + 40%CC (+10% urban
S20.002	S69	0.000	0.64				205.7	SURCHARGED		creep) storm event will be contained
S20.003	S70	0.000	0.05				19.7	SURCHARGED		within development kerbs and will
S22.000	S83	0.000	0.93				34.7	OK		re-enter the network via road gullies
S20.004	S73	0.000	0.07				22.9	SURCHARGED		located further downstream.
S23.000	S82	0.000	2.41				81.4	FLOOD RISK		
S20.005	S74	0.000	0.07				32.3	SURCHARGED		
S24.000	S84a	0.000	0.04				3.1	SURCHARGED		
S20.006	S76	0.000	0.17				36.0	SURCHARGED		
S25.000	S84	0.000	1.29				45.2	SURCHARGED		
S20.007	S77	0.000	0.01				4.3	SURCHARGED		
S20.008	S78	0.000	0.01				4.3	OK		
S20.009	S79	0.000	0.01				4.3	OK		