STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

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

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.769	4-8	0.949	8-12	0.040

Total Area Contributing (ha) = 1.758

Total Pipe Volume (m³) = 91.356

Network Design Table for Storm

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	13.299	0.170	78.2	0.035	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	12.655	0.165	76.7	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	12.059	0.175	68.9	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.003	23.979	0.160	149.9	0.000	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)
S1.000	50.00	5.15	109.460	0.035	0.0	0.0	0.0	1.48	58.8	6.3
S1.001	50.00	5.29	109.290	0.065	0.0	0.0	0.0	1.49	59.4	11.7
S1.002	50.00	5.42	109.125	0.100	0.0	0.0	0.0	1.58	62.7	18.1
S1.003	50.00	5.79	108.950	0.100	0.0	0.0	0.0	1.07	42.4	18.1

©1982-2020 Innovyze

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.004	9.965	0.060	166.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.005	22.766	0.155	146.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.006	10.292	0.245	42.0	0.058	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.007	7.560	0.245	30.9	0.004	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.008	15.612	0.070	223.0	0.041	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	32.041	0.945	33.9	0.064	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.009	15.297	0.065	235.3	0.017	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.010	30.833	0.110	280.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.011	23.387	0.080	292.3	0.069	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.012	6.562	0.105	62.5	0.041	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.013	23.973	0.280	85.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.014	28.612	0.080	357.6	0.040	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.015	36.882	0.120	307.4	0.053	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	15.853	0.100	158.5	0.071	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	40.140	0.330	121.6	0.090	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.002	24.732	1.945	12.7	0.118	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	34.019	0.335	101.5	0.070	5.00	0.0	0.600	o	225	Pipe/Conduit	
S4.001	6.865	0.280	24.5	0.049	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)
S1.004	50.00	5.96	108.790	0.100	0.0	0.0	0.0	1.01	40.2	18.1
S1.005	50.00	6.31	108.730	0.100	0.0	0.0	0.0	1.08	42.8	18.1
S1.006	50.00	6.38	108.500	0.158	0.0	0.0	0.0	2.43	172.0	28.5
S1.007	50.00	6.42	108.255	0.162	0.0	0.0	0.0	2.84	200.8	29.2
S1.008	50.00	6.67	108.010	0.203	0.0	0.0	0.0	1.05	74.1	36.7
S2.000	50.00	5.24	108.960	0.064	0.0	0.0	0.0	2.25	89.6	11.6
S1.009	50.00	6.89	107.865	0.284	0.0	0.0	0.0	1.18	130.0	51.3
S1.010	50.00	7.37	107.800	0.284	0.0	0.0	0.0	1.08	119.0	51.3
S1.011	50.00	7.74	107.690	0.353	0.0	0.0	0.0	1.05	116.5	63.7
S1.012	50.00	7.78	107.610	0.394	0.0	0.0	0.0	2.30	253.5	71.1
S1.013	50.00	7.97	107.430	0.394	0.0	0.0	0.0	2.20	349.6	71.1
S1.014	50.00	8.41	107.150	0.434	0.0	0.0	0.0	1.07	170.0	78.4
S1.015	50.00	8.94	107.070	0.487	0.0	0.0	0.0	1.15	183.6	87.9
S3.000	50.00	5.26	109.550	0.071	0.0	0.0	0.0	1.04	41.2	12.8
S3.001	50.00	5.72	109.375	0.161	0.0	0.0	0.0	1.42	100.7	29.1
S3.002	50.00	5.82	109.045	0.279	0.0	0.0	0.0	4.43	313.3	50.4
S4.000	50.00	5.44	107.790	0.070	0.0	0.0	0.0	1.30	51.6	12.6
S4.001	50.00	5.48	107.455	0.119	0.0	0.0	0.0	2.65	105.5	21.5

©1982-2020 Innovyze

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
S1.016	13.160	0.100	131.6	0.034	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.017	35.784	0.250	143.1	0.040	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.018	5.000#	0.250	20.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S5.000	60.778	0.520	116.9	0.044	5.00	0.0	0.600	o	225	Pipe/Conduit	
S6.000	26.977	0.240	112.4	0.047	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.001	17.933	0.205	87.5	0.074	0.00	0.0	0.600	o	225	Pipe/Conduit	
S5.002	31.864	0.165	193.1	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.000	15.363	0.205	74.9	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
S7.001	22.207	0.150	148.0	0.036	0.00	0.0	0.600	o	225	Pipe/Conduit	
S5.003	48.783	1.620	30.1	0.058	0.00	0.0	0.600	o	375	Pipe/Conduit	
S8.000	25.564	0.490	52.2	0.056	5.00	0.0	0.600	o	225	Pipe/Conduit	
S8.001	10.510	0.500	21.0	0.031	0.00	0.0	0.600	o	225	Pipe/Conduit	
S8.002	24.860	0.150	165.7	0.054	0.00	0.0	0.600	o	300	Pipe/Conduit	
S9.000	30.134	0.755	39.9	0.013	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)
S1.016	50.00	9.05	106.800	0.919	0.0	0.0	0.0	2.12	599.8	165.9
S1.017	50.00	9.34	106.700	0.959	0.0	0.0	0.0	2.03	575.0	173.1
S1.018	50.00	9.36	106.450	0.959	0.0	0.0	0.0	5.46	1544.3	173.1
S5.000	50.00	5.84	109.925	0.044	0.0	0.0	0.0	1.21	48.0	7.9
S6.000	50.00	5.36	109.645	0.047	0.0	0.0	0.0	1.23	49.0	8.5
S5.001	50.00	6.05	109.405	0.165	0.0	0.0	0.0	1.40	55.6	29.8
S5.002	50.00	6.52	109.125	0.191	0.0	0.0	0.0	1.13	79.7	34.5
S7.000	50.00	5.17	109.390	0.055	0.0	0.0	0.0	1.51	60.1	9.9
S7.001	50.00	5.51	109.185	0.091	0.0	0.0	0.0	1.07	42.6	16.4
S5.003	50.00	6.77	108.885	0.340	0.0	0.0	0.0	3.31	365.9	61.4
S8.000	50.00	5.23	108.605	0.056	0.0	0.0	0.0	1.81	72.2	10.1
S8.001	50.00	5.30	108.115	0.087	0.0	0.0	0.0	2.87	114.0	15.7
S8.002	50.00	5.64	107.540	0.141	0.0	0.0	0.0	1.22	86.1	25.5
S9.000	50.00	5.31	109.395	0.013	0.0	0.0	0.0	1.60	28.2	2.3

©1982-2020 Innovyze

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
S9.001	22.325	0.665	33.6	0.051	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.002	5.785	0.435	13.3	0.062	0.00	0.0	0.600	o	225	Pipe/Conduit	
S8.003	10.207	0.050	204.1	0.012	0.00	0.0	0.600	o	450	Pipe/Conduit	
S5.004	39.054	0.620	63.0	0.113	0.00	0.0	0.600	o	525	Pipe/Conduit	
S10.000	16.744	0.415	40.3	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit	
S10.001	10.237	0.130	78.7	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
S5.005	24.889	0.050	497.8	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S5.006	5.000#	0.170	29.4	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.019	7.078	0.100	70.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.020	95.626	5.150	18.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S9.001	50.00	5.48	108.565	0.064	0.0	0.0	0.0	2.27	90.1	11.6
S9.002	50.00	5.51	107.900	0.126	0.0	0.0	0.0	3.61	143.4	22.7
S8.003	50.00	5.76	107.240	0.279	0.0	0.0	0.0	1.42	225.7	50.4
S5.004	50.00	7.00	107.115	0.732	0.0	0.0	0.0	2.83	611.7	132.2
S10.000	50.00	5.18	107.415	0.033	0.0	0.0	0.0	1.59	28.1	6.0
S10.001	50.00	5.29	106.925	0.067	0.0	0.0	0.0	1.47	58.6	12.1
S5.005	50.00	7.38	106.420	0.799	0.0	0.0	0.0	1.08	306.7	144.3
S5.006	50.00	7.40	106.370	0.799	0.0	0.0	0.0	4.50	1272.8	144.3
S1.019	50.00	9.45	106.200	1.758	0.0	0.0	0.0	1.20	21.1«	317.4
S1.020	49.93	10.13	106.100	1.758	0.0	0.0	0.0	2.35	41.5«	317.4

©1982-2020 Innovyze

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SW01	110.885	1.425	Open Manhole	1200	S1.000	109.460	225				
SW02	110.715	1.425	Open Manhole	1200	S1.001	109.290	225	S1.000	109.290	225	
SW03	110.550	1.425	Open Manhole	1200	S1.002	109.125	225	S1.001	109.125	225	
SW04	110.375	1.425	Open Manhole	1200	S1.003	108.950	225	S1.002	108.950	225	
SW05	110.215	1.425	Open Manhole	1200	S1.004	108.790	225	S1.003	108.790	225	
SW06	110.375	1.645	Open Manhole	1200	S1.005	108.730	225	S1.004	108.730	225	
SW07	110.000	1.500	Open Manhole	1200	S1.006	108.500	300	S1.005	108.575	225	
SW08	109.755	1.500	Open Manhole	1200	S1.007	108.255	300	S1.006	108.255	300	
SW09	109.510	1.500	Open Manhole	1200	S1.008	108.010	300	S1.007	108.010	300	
SW10	110.385	1.425	Open Manhole	1200	S2.000	108.960	225				
SW11	109.610	1.745	Open Manhole	1500	S1.009	107.865	375	S1.008	107.940	300	
								S2.000	108.015	225	
SW12	109.465	1.665	Open Manhole	1500	S1.010	107.800	375	S1.009	107.800	375	
SW13	109.450	1.760	Open Manhole	1500	S1.011	107.690	375	S1.010	107.690	375	
SW14	109.310	1.700	Open Manhole	1500	S1.012	107.610	375	S1.011	107.610	375	
SW15	109.080	1.650	Open Manhole	1500	S1.013	107.430	450	S1.012	107.505	375	
SW16	108.500	1.350	Open Manhole	1500	S1.014	107.150	450	S1.013	107.150	450	
SW17	109.075	2.005	Open Manhole	1500	S1.015	107.070	450	S1.014	107.070	450	
SW18	111.175	1.625	Open Manhole	1200	S3.000	109.550	225				
SW19	111.010	1.635	Open Manhole	1200	S3.001	109.375	300	S3.000	109.450	225	
SW20	110.595	1.550	Open Manhole	1200	S3.002	109.045	300	S3.001	109.045	300	
SW21	109.450	1.660	Open Manhole	1200	S4.000	107.790	225				
SW22	109.775	2.320	Open Manhole	1200	S4.001	107.455	225	S4.000	107.455	225	
SW23	109.690	2.890	Open Manhole	1500	S1.016	106.800	600	S1.015	106.950	450	
								S3.002	107.100	300	
								S4.001	107.175	225	
SW24	109.200	2.500	Open Manhole	1500	S1.017	106.700	600	S1.016	106.700	600	
SW25	107.800	1.350	Open Manhole	1500	S1.018	106.450	600	S1.017	106.450	600	
HD26	111.350	1.425	Open Manhole	1200	S5.000	109.925	225				
HD27	111.070	1.425	Open Manhole	1200	S6.000	109.645	225				
HD28	110.925	1.520	Open Manhole	1200	S5.001	109.405	225	S5.000	109.405	225	
								S6.000	109.405	225	
SW29	110.625	1.500	Open Manhole	1200	S5.002	109.125	300	S5.001	109.200	225	
SW30	110.815	1.425	Open Manhole	1200	S7.000	109.390	225				
SW31	110.610	1.425	Open Manhole	1200	S7.001	109.185	225	S7.000	109.185	225	
SW32	110.535	1.650	Open Manhole	1350	S5.003	108.885	375	S5.002	108.960	300	
								S7.001	109.035	225	
SW34	110.510	1.905	Open Manhole	1200	S8.000	108.605	225				

©1982-2020 Innovyze

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SW35	109.905	1.790	Open Manhole	1200	S8.001	108.115	225	S8.000	108.115	225	
SW36	109.660	2.120	Open Manhole	1200	S8.002	107.540	300	S8.001	107.615	225	
SW38	110.795	1.400	Open Manhole	1200	S9.000	109.395	150				
SW39	110.065	1.500	Open Manhole	1200	S9.001	108.565	225	S9.000	108.640	150	
SW40	109.325	1.425	Open Manhole	1200	S9.002	107.900	225	S9.001	107.900	225	
SW41	109.040	1.800	Open Manhole	1500	S8.003	107.240	450	S8.002	107.390	300	
								S9.002	107.465	225	
SW42	109.175	2.060	Open Manhole	1500	S5.004	107.115	525	S5.003	107.265	375	
								S8.003	107.190	450	
SW43	108.765	1.350	Open Manhole	1200	S10.000	107.415	150				
SW44	108.255	1.330	Open Manhole	1200	S10.001	106.925	225	S10.000	107.000	150	
SW45	107.950	1.530	Open Manhole	1500	S5.005	106.420	600	S5.004	106.495	525	
								S10.001	106.795	225	
SW46	107.800	1.430	Open Manhole	1500	S5.006	106.370	600	S5.005	106.370	600	
SW47	107.800	1.600	Open Manhole	1500	S1.019	106.200	150	S1.018	106.200	600	
								S5.006	106.200	600	
SW48	107.800	1.700	Open Manhole	3000	S1.020	106.100	150	S1.019	106.100	150	
	102.500	1.550	Open Manhole	0		OUTFALL		S1.020	100.950	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SW01	450509.357	306452.555	450509.357	306452.555	Required	
SW02	450496.959	306457.368	450496.959	306457.368	Required	
SW03	450485.235	306462.132	450485.235	306462.132	Required	
SW04	450474.089	306466.736	450474.089	306466.736	Required	
SW05	450465.532	306444.336	450465.532	306444.336	Required	
SW06	450469.647	306435.260	450469.647	306435.260	Required	

©1982-2020 Innovyze

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SW07	450463.100	306413.500	450463.100	306413.500	Required	
SW08	450460.791	306403.470	450460.791	306403.470	Required	
SW09	450460.955	306395.912	450460.955	306395.912	Required	
SW10	450495.462	306386.986	450495.462	306386.986	Required	
SW11	450464.061	306380.612	450464.061	306380.612	Required	
SW12	450467.104	306365.621	450467.104	306365.621	Required	
SW13	450486.444	306341.607	450486.444	306341.607	Required	
SW14	450499.780	306322.395	450499.780	306322.395	Required	
SW15	450498.924	306315.889	450498.924	306315.889	Required	
SW16	450513.361	306296.750	450513.361	306296.750	Required	
SW17	450536.568	306313.485	450536.568	306313.485	Required	
SW18	450523.499	306403.914	450523.499	306403.914	Required	
SW19	450527.125	306388.482	450527.125	306388.482	Required	
SW20	450550.886	306356.130	450550.886	306356.130	Required	
SW21	450597.946	306361.238	450597.946	306361.238	Required	

©1982-2020 Innovyze

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SW22	450570.994	306340.479	450570.994	306340.479	Required	
SW23	450565.591	306336.244	450565.591	306336.244	Required	
SW24	450573.635	306325.829	450573.635	306325.829	Required	
SW25	450609.393	306324.450	450609.393	306324.450	Required	
HD26	450558.632	306511.515	450558.632	306511.515	Required	
HD27	450532.940	306428.172	450532.940	306428.172	Required	
HD28	450545.065	306452.271	450545.065	306452.271	Required	
SW29	450561.391	306444.850	450561.391	306444.850	Required	
SW30	450570.078	306401.323	450570.078	306401.323	Required	
SW31	450582.097	306410.891	450582.097	306410.891	Required	
SW32	450590.330	306431.515	450590.330	306431.515	Required	
SW34	450633.971	306475.844	450633.971	306475.844	Required	
SW35	450644.694	306452.637	450644.694	306452.637	Required	
SW36	450648.979	306443.040	450648.979	306443.040	Required	
SW38	450586.084	306444.874	450586.084	306444.874	Required	

©1982-2020 Innovyze

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SW39	450613.329	306431.999	450613.329	306431.999	Required	
SW40	450633.598	306422.641	450633.598	306422.641	Required	
SW41	450638.896	306420.317	450638.896	306420.317	Required	
SW42	450634.614	306411.052	450634.614	306411.052	Required	
SW43	450654.574	306412.611	450654.574	306412.611	Required	
SW44	450669.707	306405.445	450669.707	306405.445	Required	
SW45	450670.318	306395.226	450670.318	306395.226	Required	
SW46	450670.854	306370.342	450670.854	306370.342	Required	
SW47	450631.834	306316.740	450631.834	306316.740	Required	
SW48	450634.264	306310.092	450634.264	306310.092	Required	
	450707.730	306248.880			No Entry	

©1982-2020 Innovyze

PIPELINE SCHEDULES for Storm

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	225	SW01	110.885	109.460	1.200	Open Manhole	1200
S1.001	o	225	SW02	110.715	109.290	1.200	Open Manhole	1200
S1.002	o	225	SW03	110.550	109.125	1.200	Open Manhole	1200
S1.003	o	225	SW04	110.375	108.950	1.200	Open Manhole	1200
S1.004	o	225	SW05	110.215	108.790	1.200	Open Manhole	1200
S1.005	o	225	SW06	110.375	108.730	1.420	Open Manhole	1200
S1.006	o	300	SW07	110.000	108.500	1.200	Open Manhole	1200
S1.007	o	300	SW08	109.755	108.255	1.200	Open Manhole	1200
S1.008	o	300	SW09	109.510	108.010	1.200	Open Manhole	1200
S2.000	o	225	SW10	110.385	108.960	1.200	Open Manhole	1200
S1.009	o	375	SW11	109.610	107.865	1.370	Open Manhole	1500
S1.010	o	375	SW12	109.465	107.800	1.290	Open Manhole	1500
S1.011	o	375	SW13	109.450	107.690	1.385	Open Manhole	1500
S1.012	o	375	SW14	109.310	107.610	1.325	Open Manhole	1500
S1.013	o	450	SW15	109.080	107.430	1.200	Open Manhole	1500
S1.014	o	450	SW16	108.500	107.150	0.900	Open Manhole	1500
S1.015	o	450	SW17	109.075	107.070	1.555	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	13.299	78.2	SW02	110.715	109.290	1.200	Open Manhole	1200
S1.001	12.655	76.7	SW03	110.550	109.125	1.200	Open Manhole	1200
S1.002	12.059	68.9	SW04	110.375	108.950	1.200	Open Manhole	1200
S1.003	23.979	149.9	SW05	110.215	108.790	1.200	Open Manhole	1200
S1.004	9.965	166.1	SW06	110.375	108.730	1.420	Open Manhole	1200
S1.005	22.766	146.9	SW07	110.000	108.575	1.200	Open Manhole	1200
S1.006	10.292	42.0	SW08	109.755	108.255	1.200	Open Manhole	1200
S1.007	7.560	30.9	SW09	109.510	108.010	1.200	Open Manhole	1200
S1.008	15.612	223.0	SW11	109.610	107.940	1.370	Open Manhole	1500
S2.000	32.041	33.9	SW11	109.610	108.015	1.370	Open Manhole	1500
S1.009	15.297	235.3	SW12	109.465	107.800	1.290	Open Manhole	1500
S1.010	30.833	280.3	SW13	109.450	107.690	1.385	Open Manhole	1500
S1.011	23.387	292.3	SW14	109.310	107.610	1.325	Open Manhole	1500
S1.012	6.562	62.5	SW15	109.080	107.505	1.200	Open Manhole	1500
S1.013	23.973	85.6	SW16	108.500	107.150	0.900	Open Manhole	1500
S1.014	28.612	357.6	SW17	109.075	107.070	1.555	Open Manhole	1500
S1.015	36.882	307.4	SW23	109.690	106.950	2.290	Open Manhole	1500

©1982-2020 Innovyze

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.000	o	225	SW18	111.175	109.550	1.400	Open Manhole	1200
S3.001	o	300	SW19	111.010	109.375	1.335	Open Manhole	1200
S3.002	o	300	SW20	110.595	109.045	1.250	Open Manhole	1200
S4.000	o	225	SW21	109.450	107.790	1.435	Open Manhole	1200
S4.001	o	225	SW22	109.775	107.455	2.095	Open Manhole	1200
S1.016	o	600	SW23	109.690	106.800	2.290	Open Manhole	1500
S1.017	o	600	SW24	109.200	106.700	1.900	Open Manhole	1500
S1.018	o	600	SW25	107.800	106.450	0.750	Open Manhole	1500
S5.000	o	225	HD26	111.350	109.925	1.200	Open Manhole	1200
S6.000	o	225	HD27	111.070	109.645	1.200	Open Manhole	1200
S5.001	o	225	HD28	110.925	109.405	1.295	Open Manhole	1200
S5.002	o	300	SW29	110.625	109.125	1.200	Open Manhole	1200
S7.000	o	225	SW30	110.815	109.390	1.200	Open Manhole	1200
S7.001	o	225	SW31	110.610	109.185	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.000	15.853	158.5	SW19	111.010	109.450	1.335	Open Manhole	1200
S3.001	40.140	121.6	SW20	110.595	109.045	1.250	Open Manhole	1200
S3.002	24.732	12.7	SW23	109.690	107.100	2.290	Open Manhole	1500
S4.000	34.019	101.5	SW22	109.775	107.455	2.095	Open Manhole	1200
S4.001	6.865	24.5	SW23	109.690	107.175	2.290	Open Manhole	1500
S1.016	13.160	131.6	SW24	109.200	106.700	1.900	Open Manhole	1500
S1.017	35.784	143.1	SW25	107.800	106.450	0.750	Open Manhole	1500
S1.018	5.000#	20.0	SW47	107.800	106.200	1.000	Open Manhole	1500
S5.000	60.778	116.9	HD28	110.925	109.405	1.295	Open Manhole	1200
S6.000	26.977	112.4	HD28	110.925	109.405	1.295	Open Manhole	1200
S5.001	17.933	87.5	SW29	110.625	109.200	1.200	Open Manhole	1200
S5.002	31.864	193.1	SW32	110.535	108.960	1.275	Open Manhole	1350
S7.000	15.363	74.9	SW31	110.610	109.185	1.200	Open Manhole	1200
S7.001	22.207	148.0	SW32	110.535	109.035	1.275	Open Manhole	1350

©1982-2020 Innovyze

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.003	o	375	SW32	110.535	108.885	1.275	Open Manhole	1350
S8.000	o	225	SW34	110.510	108.605	1.680	Open Manhole	1200
S8.001	o	225	SW35	109.905	108.115	1.565	Open Manhole	1200
S8.002	o	300	SW36	109.660	107.540	1.820	Open Manhole	1200
S9.000	o	150	SW38	110.795	109.395	1.250	Open Manhole	1200
S9.001	o	225	SW39	110.065	108.565	1.275	Open Manhole	1200
S9.002	o	225	SW40	109.325	107.900	1.200	Open Manhole	1200
S8.003	o	450	SW41	109.040	107.240	1.350	Open Manhole	1500
S5.004	o	525	SW42	109.175	107.115	1.535	Open Manhole	1500
S10.000	o	150	SW43	108.765	107.415	1.200	Open Manhole	1200
S10.001	o	225	SW44	108.255	106.925	1.105	Open Manhole	1200
S5.005	o	600	SW45	107.950	106.420	0.930	Open Manhole	1500
S5.006	o	600	SW46	107.800	106.370	0.830	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.003	48.783	30.1	SW42	109.175	107.265	1.535	Open Manhole	1500
S8.000	25.564	52.2	SW35	109.905	108.115	1.565	Open Manhole	1200
S8.001	10.510	21.0	SW36	109.660	107.615	1.820	Open Manhole	1200
S8.002	24.860	165.7	SW41	109.040	107.390	1.350	Open Manhole	1500
S9.000	30.134	39.9	SW39	110.065	108.640	1.275	Open Manhole	1200
S9.001	22.325	33.6	SW40	109.325	107.900	1.200	Open Manhole	1200
S9.002	5.785	13.3	SW41	109.040	107.465	1.350	Open Manhole	1500
S8.003	10.207	204.1	SW42	109.175	107.190	1.535	Open Manhole	1500
S5.004	39.054	63.0	SW45	107.950	106.495	0.930	Open Manhole	1500
S10.000	16.744	40.3	SW44	108.255	107.000	1.105	Open Manhole	1200
S10.001	10.237	78.7	SW45	107.950	106.795	0.930	Open Manhole	1500
S5.005	24.889	497.8	SW46	107.800	106.370	0.830	Open Manhole	1500
S5.006	5.000#	29.4	SW47	107.800	106.200	1.000	Open Manhole	1500

©1982-2020 Innovyze

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.019	o	150	SW47	107.800	106.200	1.450	Open Manhole	1500
S1.020	o	150	SW48	107.800	106.100	1.550	Open Manhole	3000

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.019	7.078	70.8	SW48	107.800	106.100	1.550	Open Manhole	3000
S1.020	95.626	18.6		102.500	100.950	1.400	Open Manhole	0

©1982-2020 Innovyze

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.035	0.035	0.035
1.001	-	-	100	0.030	0.030	0.030
1.002	-	-	100	0.035	0.035	0.035
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.058	0.058	0.058
1.007	-	-	100	0.004	0.004	0.004
1.008	-	-	100	0.041	0.041	0.041
2.000	-	-	100	0.064	0.064	0.064
1.009	-	-	100	0.017	0.017	0.017
1.010	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.069	0.069	0.069
1.012	-	-	100	0.041	0.041	0.041
1.013	-	-	100	0.000	0.000	0.000
1.014	-	-	100	0.040	0.040	0.040
1.015	-	-	100	0.053	0.053	0.053
3.000	-	-	100	0.071	0.071	0.071
3.001	-	-	100	0.090	0.090	0.090
3.002	-	-	100	0.118	0.118	0.118
4.000	-	-	100	0.070	0.070	0.070
4.001	-	-	100	0.049	0.049	0.049
1.016	-	-	100	0.034	0.034	0.034
1.017	-	-	100	0.040	0.040	0.040
1.018	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.044	0.044	0.044
6.000	-	-	100	0.047	0.047	0.047
5.001	-	-	100	0.074	0.074	0.074
5.002	-	-	100	0.026	0.026	0.026
7.000	-	-	100	0.055	0.055	0.055
7.001	-	-	100	0.036	0.036	0.036
5.003	-	-	100	0.058	0.058	0.058
8.000	-	-	100	0.056	0.056	0.056
8.001	-	-	100	0.031	0.031	0.031
8.002	-	-	100	0.054	0.054	0.054
9.000	-	-	100	0.013	0.013	0.013
9.001	-	-	100	0.051	0.051	0.051
9.002	-	-	100	0.062	0.062	0.062
8.003	-	-	100	0.012	0.012	0.012
5.004	-	-	100	0.113	0.113	0.113
10.000	-	-	100	0.033	0.033	0.033
10.001	-	-	100	0.034	0.034	0.034
5.005	-	-	100	0.000	0.000	0.000
5.006	-	-	100	0.000	0.000	0.000
1.019	-	-	100	0.000	0.000	0.000
1.020	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.758	1.758	1.758

©1982-2020 Innovyze

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)
S1.020		102.500	100.950	0.000	0	0

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	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

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

©1982-2020 Innovyze

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SW47, DS/PN: S1.019, Volume (m³): 4.8

Unit Reference	MD-SHE-0141-9900-1300-9900
Design Head (m)	1.300
Design Flow (l/s)	9.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	141
Invert Level (m)	106.200
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	9.9
Flush-Flo™	0.382	9.9
Kick-Flo®	0.825	8.0
Mean Flow over Head Range	-	8.6

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.1	1.200	9.5	3.000	14.7	7.000	22.1
0.200	9.2	1.400	10.3	3.500	15.8	7.500	22.8
0.300	9.8	1.600	10.9	4.000	16.9	8.000	23.5
0.400	9.9	1.800	11.5	4.500	17.8	8.500	24.2
0.500	9.8	2.000	12.1	5.000	18.8	9.000	24.9
0.600	9.5	2.200	12.7	5.500	19.6	9.500	25.6
0.800	8.3	2.400	13.2	6.000	20.5		
1.000	8.8	2.600	13.7	6.500	21.3		

©1982-2020 Innovyze

Storage Structures for Storm

Tank or Pond Manhole: SW47, DS/PN: S1.019

Invert Level (m) 106.200

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	809.0	1.600	1859.0

©1982-2020 Innovyze

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 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status OFF

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	SW01	15 Summer	1	+0%	100/15 Summer				109.512
S1.001	SW02	15 Summer	1	+0%	100/15 Summer				109.360
S1.002	SW03	15 Summer	1	+0%	100/15 Summer				109.209
S1.003	SW04	15 Summer	1	+0%	30/15 Summer				109.050
S1.004	SW05	15 Summer	1	+0%	30/15 Summer				108.898
S1.005	SW06	15 Summer	1	+0%	30/15 Summer				108.829
S1.006	SW07	15 Summer	1	+0%	100/15 Summer				108.589
S1.007	SW08	15 Summer	1	+0%	100/15 Summer				108.345
S1.008	SW09	15 Summer	1	+0%	30/15 Summer				108.156
S2.000	SW10	15 Summer	1	+0%	100/15 Summer				109.015
S1.009	SW11	15 Summer	1	+0%	30/15 Summer				108.031
S1.010	SW12	15 Summer	1	+0%	30/15 Summer				107.964
S1.011	SW13	15 Summer	1	+0%	30/15 Summer				107.877
S1.012	SW14	15 Summer	1	+0%	100/15 Summer				107.779
S1.013	SW15	15 Summer	1	+0%	100/15 Summer				107.559
S1.014	SW16	15 Summer	1	+0%	100/15 Summer				107.349
S1.015	SW17	15 Summer	1	+0%	100/15 Summer				107.262
S3.000	SW18	15 Summer	1	+0%	100/15 Summer				109.641
S3.001	SW19	15 Summer	1	+0%	100/15 Summer				109.483
S3.002	SW20	15 Summer	1	+0%					109.124
S4.000	SW21	15 Summer	1	+0%	100/15 Summer				107.867

©1982-2020 Innovyze

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)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SW01	-0.173	0.000	0.12			6.2	OK	
S1.001	SW02	-0.155	0.000	0.21			10.6	OK	
S1.002	SW03	-0.141	0.000	0.29			15.8	OK	
S1.003	SW04	-0.125	0.000	0.41			15.8	OK	
S1.004	SW05	-0.117	0.000	0.47			15.7	OK	
S1.005	SW06	-0.126	0.000	0.40			15.8	OK	
S1.006	SW07	-0.211	0.000	0.19			23.2	OK	
S1.007	SW08	-0.210	0.000	0.19			23.8	OK	
S1.008	SW09	-0.154	0.000	0.47			29.2	OK	
S2.000	SW10	-0.170	0.000	0.13			11.3	OK	
S1.009	SW11	-0.209	0.000	0.40			41.6	OK	
S1.010	SW12	-0.211	0.000	0.39			41.2	OK	
S1.011	SW13	-0.188	0.000	0.49			48.9	OK	
S1.012	SW14	-0.206	0.000	0.42			53.2	OK	
S1.013	SW15	-0.321	0.000	0.18			52.9	OK	
S1.014	SW16	-0.251	0.000	0.39			56.8	OK	
S1.015	SW17	-0.258	0.000	0.38			60.9	OK	
S3.000	SW18	-0.134	0.000	0.34			12.4	OK	
S3.001	SW19	-0.192	0.000	0.27			25.6	OK	
S3.002	SW20	-0.221	0.000	0.15			42.7	OK	
S4.000	SW21	-0.148	0.000	0.25			12.2	OK	

©1982-2020 Innovyze

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.
S4.001	SW22	15 Summer	1	+0%	100/15 Summer			
S1.016	SW23	30 Summer	1	+0%	100/15 Summer			
S1.017	SW24	30 Summer	1	+0%	100/15 Summer			
S1.018	SW25	30 Summer	1	+0%	100/15 Summer			
S5.000	HD26	15 Summer	1	+0%	100/15 Summer			
S6.000	HD27	15 Summer	1	+0%	100/15 Summer			
S5.001	HD28	15 Summer	1	+0%	30/15 Summer			
S5.002	SW29	15 Summer	1	+0%	100/15 Summer			
S7.000	SW30	15 Summer	1	+0%	100/15 Summer			
S7.001	SW31	15 Summer	1	+0%	30/15 Summer			
S5.003	SW32	15 Summer	1	+0%				
S8.000	SW34	15 Summer	1	+0%				
S8.001	SW35	15 Summer	1	+0%	100/15 Summer			
S8.002	SW36	15 Summer	1	+0%	100/15 Summer			
S9.000	SW38	15 Summer	1	+0%				
S9.001	SW39	15 Summer	1	+0%				
S9.002	SW40	15 Summer	1	+0%	100/15 Summer			
S8.003	SW41	15 Summer	1	+0%	100/15 Summer			
S5.004	SW42	15 Summer	1	+0%	100/15 Summer			
S10.000	SW43	15 Summer	1	+0%	100/15 Summer			
S10.001	SW44	15 Summer	1	+0%	100/15 Summer			
S5.005	SW45	15 Summer	1	+0%	30/15 Summer			
S5.006	SW46	15 Summer	1	+0%	100/15 Summer			
S1.019	SW47	480 Summer	1	+0%	1/15 Summer			
S1.020	SW48	480 Summer	1	+0%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S4.001	SW22	107.534	-0.146	0.000	0.26			19.4	OK
S1.016	SW23	107.030	-0.370	0.000	0.31			108.9	OK
S1.017	SW24	106.897	-0.403	0.000	0.23			113.0	OK
S1.018	SW25	106.643	-0.407	0.000	0.23			113.3	OK
S5.000	HD26	109.987	-0.163	0.000	0.16			7.5	OK
S6.000	HD27	109.710	-0.160	0.000	0.18			8.2	OK
S5.001	HD28	109.523	-0.107	0.000	0.53			26.5	OK
S5.002	SW29	109.259	-0.166	0.000	0.41			30.0	OK
S7.000	SW30	109.455	-0.160	0.000	0.18			9.7	OK
S7.001	SW31	109.283	-0.127	0.000	0.39			15.0	OK
S5.003	SW32	108.984	-0.276	0.000	0.16			53.2	OK
S8.000	SW34	108.663	-0.167	0.000	0.15			9.9	OK
S8.001	SW35	108.174	-0.166	0.000	0.15			14.5	OK
S8.002	SW36	107.651	-0.189	0.000	0.29			22.5	OK
S9.000	SW38	109.424	-0.121	0.000	0.08			2.3	OK
S9.001	SW39	108.617	-0.173	0.000	0.12			9.9	OK
S9.002	SW40	107.969	-0.156	0.000	0.21			19.1	OK

©1982-2020 Innovyze

1 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.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S8.003	SW41	107.401	-0.289	0.000	0.27			43.3	OK
S5.004	SW42	107.279	-0.361	0.000	0.21			112.4	OK
S10.000	SW43	107.463	-0.102	0.000	0.22			5.8	OK
S10.001	SW44	106.997	-0.153	0.000	0.22			10.9	OK
S5.005	SW45	106.723	-0.297	0.000	0.50			121.3	OK
S5.006	SW46	106.592	-0.378	0.000	0.30			122.0	OK
S1.019	SW47	106.501	0.151	0.000	0.54			9.8	SURCHARGED
S1.020	SW48	106.149	-0.101	0.000	0.24			9.8	OK

PN	US/MH Name	Level Exceeded
S4.001	SW22	
S1.016	SW23	
S1.017	SW24	
S1.018	SW25	
S5.000	HD26	
S6.000	HD27	
S5.001	HD28	
S5.002	SW29	
S7.000	SW30	
S7.001	SW31	
S5.003	SW32	
S8.000	SW34	
S8.001	SW35	
S8.002	SW36	
S9.000	SW38	
S9.001	SW39	
S9.002	SW40	
S8.003	SW41	
S5.004	SW42	
S10.000	SW43	
S10.001	SW44	
S5.005	SW45	
S5.006	SW46	
S1.019	SW47	
S1.020	SW48	

©1982-2020 Innovyze

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 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status OFF

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	SW01	15 Summer	30	+0%	100/15 Summer				109.544
S1.001	SW02	15 Summer	30	+0%	100/15 Summer				109.414
S1.002	SW03	15 Summer	30	+0%	100/15 Summer				109.347
S1.003	SW04	15 Summer	30	+0%	30/15 Summer				109.234
S1.004	SW05	15 Summer	30	+0%	30/15 Summer				109.049
S1.005	SW06	15 Summer	30	+0%	30/15 Summer				108.960
S1.006	SW07	15 Summer	30	+0%	100/15 Summer				108.654
S1.007	SW08	15 Summer	30	+0%	100/15 Summer				108.452
S1.008	SW09	15 Summer	30	+0%	30/15 Summer				108.390
S2.000	SW10	15 Summer	30	+0%	100/15 Summer				109.049
S1.009	SW11	15 Summer	30	+0%	30/15 Summer				108.285
S1.010	SW12	15 Summer	30	+0%	30/15 Summer				108.208
S1.011	SW13	15 Summer	30	+0%	30/15 Summer				108.101
S1.012	SW14	15 Summer	30	+0%	100/15 Summer				107.985
S1.013	SW15	15 Summer	30	+0%	100/15 Summer				107.637
S1.014	SW16	15 Summer	30	+0%	100/15 Summer				107.499
S1.015	SW17	15 Summer	30	+0%	100/15 Summer				107.408
S3.000	SW18	15 Summer	30	+0%	100/15 Summer				109.710
S3.001	SW19	15 Summer	30	+0%	100/15 Summer				109.579
S3.002	SW20	15 Summer	30	+0%					109.190
S4.000	SW21	15 Summer	30	+0%	100/15 Summer				107.920

©1982-2020 Innovyze

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)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SW01	-0.141	0.000	0.30			15.2	OK	
S1.001	SW02	-0.101	0.000	0.58			29.7	OK	
S1.002	SW03	-0.003	0.000	0.81			43.5	OK	
S1.003	SW04	0.059	0.000	1.09			42.5	SURCHARGED	
S1.004	SW05	0.034	0.000	1.24			41.4	SURCHARGED	
S1.005	SW06	0.005	0.000	1.04			40.8	SURCHARGED	
S1.006	SW07	-0.146	0.000	0.50			62.2	OK	
S1.007	SW08	-0.103	0.000	0.50			62.3	OK	
S1.008	SW09	0.080	0.000	1.24			77.7	SURCHARGED	
S2.000	SW10	-0.136	0.000	0.33			27.8	OK	
S1.009	SW11	0.045	0.000	1.02			106.6	SURCHARGED	
S1.010	SW12	0.033	0.000	1.00			105.2	SURCHARGED	
S1.011	SW13	0.036	0.000	1.22			122.2	SURCHARGED	
S1.012	SW14	0.000	0.000	1.00			126.9	OK	
S1.013	SW15	-0.243	0.000	0.44			126.9	OK	
S1.014	SW16	-0.101	0.000	0.93			135.2	OK	
S1.015	SW17	-0.112	0.000	0.90			146.0	OK	
S3.000	SW18	-0.065	0.000	0.84			30.5	OK	
S3.001	SW19	-0.096	0.000	0.77			72.1	OK	
S3.002	SW20	-0.155	0.000	0.46			128.4	OK	
S4.000	SW21	-0.095	0.000	0.62			29.9	OK	

©1982-2020 Innovyze

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.
S4.001	SW22	15 Summer	30	+0%	100/15 Summer			
S1.016	SW23	15 Summer	30	+0%	100/15 Summer			
S1.017	SW24	15 Summer	30	+0%	100/15 Summer			
S1.018	SW25	480 Summer	30	+0%	100/15 Summer			
S5.000	HD26	15 Summer	30	+0%	100/15 Summer			
S6.000	HD27	15 Summer	30	+0%	100/15 Summer			
S5.001	HD28	15 Summer	30	+0%	30/15 Summer			
S5.002	SW29	15 Summer	30	+0%	100/15 Summer			
S7.000	SW30	15 Summer	30	+0%	100/15 Summer			
S7.001	SW31	15 Summer	30	+0%	30/15 Summer			
S5.003	SW32	15 Summer	30	+0%				
S8.000	SW34	15 Summer	30	+0%				
S8.001	SW35	15 Summer	30	+0%	100/15 Summer			
S8.002	SW36	15 Summer	30	+0%	100/15 Summer			
S9.000	SW38	15 Summer	30	+0%				
S9.001	SW39	15 Summer	30	+0%				
S9.002	SW40	15 Summer	30	+0%	100/15 Summer			
S8.003	SW41	15 Summer	30	+0%	100/15 Summer			
S5.004	SW42	15 Summer	30	+0%	100/15 Summer			
S10.000	SW43	15 Summer	30	+0%	100/15 Summer			
S10.001	SW44	15 Summer	30	+0%	100/15 Summer			
S5.005	SW45	15 Summer	30	+0%	30/15 Summer			
S5.006	SW46	480 Summer	30	+0%	100/15 Summer			
S1.019	SW47	480 Summer	30	+0%	1/15 Summer			
S1.020	SW48	60 Winter	30	+0%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S4.001	SW22	107.598	-0.082	0.000	0.71			53.1	OK
S1.016	SW23	107.245	-0.155	0.000	0.89			308.6	OK
S1.017	SW24	107.064	-0.236	0.000	0.67			321.6	OK
S1.018	SW25	106.881	-0.169	0.000	0.13			63.5	OK
S5.000	HD26	110.026	-0.124	0.000	0.40			18.5	OK
S6.000	HD27	109.824	-0.046	0.000	0.42			19.0	OK
S5.001	HD28	109.779	0.149	0.000	1.31			65.4	SURCHARGED
S5.002	SW29	109.422	-0.003	0.000	1.00			72.7	OK
S7.000	SW30	109.496	-0.119	0.000	0.45			23.9	OK
S7.001	SW31	109.413	0.003	0.000	1.01			39.4	SURCHARGED
S5.003	SW32	109.052	-0.208	0.000	0.40			135.5	OK
S8.000	SW34	108.699	-0.131	0.000	0.37			24.3	OK
S8.001	SW35	108.216	-0.124	0.000	0.41			39.2	OK
S8.002	SW36	107.755	-0.085	0.000	0.84			64.7	OK
S9.000	SW38	109.441	-0.104	0.000	0.21			5.6	OK
S9.001	SW39	108.660	-0.130	0.000	0.37			30.4	OK
S9.002	SW40	108.033	-0.092	0.000	0.65			60.6	OK

©1982-2020 Innovyze

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.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S8.003	SW41	107.555	-0.135	0.000	0.82			129.6	OK
S5.004	SW42	107.411	-0.229	0.000	0.59			314.0	OK
S10.000	SW43	107.495	-0.070	0.000	0.55			14.3	OK
S10.001	SW44	107.095	-0.055	0.000	0.60			29.6	OK
S5.005	SW45	107.043	0.023	0.000	1.41			340.8	SURCHARGED
S5.006	SW46	106.881	-0.089	0.000	0.13			52.2	OK
S1.019	SW47	106.880	0.530	0.000	0.55			9.8	SURCHARGED
S1.020	SW48	106.150	-0.100	0.000	0.24			9.9	OK

PN	US/MH Name	Level Exceeded
S4.001	SW22	
S1.016	SW23	
S1.017	SW24	
S1.018	SW25	
S5.000	HD26	
S6.000	HD27	
S5.001	HD28	
S5.002	SW29	
S7.000	SW30	
S7.001	SW31	
S5.003	SW32	
S8.000	SW34	
S8.001	SW35	
S8.002	SW36	
S9.000	SW38	
S9.001	SW39	
S9.002	SW40	
S8.003	SW41	
S5.004	SW42	
S10.000	SW43	
S10.001	SW44	
S5.005	SW45	
S5.006	SW46	
S1.019	SW47	
S1.020	SW48	

©1982-2020 Innovyze

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

Simulation Criteria

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status OFF

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	SW01	15 Summer	100	+40%	100/15 Summer				110.338
S1.001	SW02	15 Summer	100	+40%	100/15 Summer				110.301
S1.002	SW03	15 Summer	100	+40%	100/15 Summer				110.224
S1.003	SW04	15 Summer	100	+40%	30/15 Summer				110.071
S1.004	SW05	15 Summer	100	+40%	30/15 Summer				109.805
S1.005	SW06	15 Summer	100	+40%	30/15 Summer				109.669
S1.006	SW07	15 Summer	100	+40%	100/15 Summer				109.452
S1.007	SW08	15 Summer	100	+40%	100/15 Summer				109.355
S1.008	SW09	15 Summer	100	+40%	30/15 Summer				109.262
S2.000	SW10	15 Summer	100	+40%	100/15 Summer				109.312
S1.009	SW11	15 Summer	100	+40%	30/15 Summer				109.088
S1.010	SW12	15 Summer	100	+40%	30/15 Summer				108.950
S1.011	SW13	15 Summer	100	+40%	30/15 Summer				108.765
S1.012	SW14	15 Summer	100	+40%	100/15 Summer				108.511
S1.013	SW15	15 Summer	100	+40%	100/15 Summer				108.249
S1.014	SW16	15 Summer	100	+40%	100/15 Summer				108.122
S1.015	SW17	15 Summer	100	+40%	100/15 Summer				107.942
S3.000	SW18	15 Summer	100	+40%	100/15 Summer				110.193
S3.001	SW19	15 Summer	100	+40%	100/15 Summer				109.974
S3.002	SW20	15 Summer	100	+40%					109.254
S4.000	SW21	15 Summer	100	+40%	100/15 Summer				108.370

©1982-2020 Innovyze

100 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)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SW01	0.653	0.000	0.42			21.6	SURCHARGED	
S1.001	SW02	0.786	0.000	0.75			38.2	SURCHARGED	
S1.002	SW03	0.874	0.000	1.13			60.5	SURCHARGED	
S1.003	SW04	0.896	0.000	1.40			54.6	SURCHARGED	
S1.004	SW05	0.790	0.000	1.59			53.2	SURCHARGED	
S1.005	SW06	0.714	0.000	1.46			57.3	SURCHARGED	
S1.006	SW07	0.652	0.000	0.63			78.5	SURCHARGED	
S1.007	SW08	0.800	0.000	0.67			83.5	SURCHARGED	
S1.008	SW09	0.952	0.000	1.56			97.5	FLOOD RISK	
S2.000	SW10	0.127	0.000	0.59			49.8	SURCHARGED	
S1.009	SW11	0.848	0.000	1.41			147.3	SURCHARGED	
S1.010	SW12	0.775	0.000	1.42			150.3	SURCHARGED	
S1.011	SW13	0.700	0.000	1.77			176.9	SURCHARGED	
S1.012	SW14	0.526	0.000	1.55			197.2	SURCHARGED	
S1.013	SW15	0.369	0.000	0.69			199.9	SURCHARGED	
S1.014	SW16	0.522	0.000	1.50			218.3	SURCHARGED	
S1.015	SW17	0.422	0.000	1.48			240.3	SURCHARGED	
S3.000	SW18	0.418	0.000	1.53			55.8	SURCHARGED	
S3.001	SW19	0.299	0.000	1.35			126.3	SURCHARGED	
S3.002	SW20	-0.091	0.000	0.79			221.9	OK	
S4.000	SW21	0.355	0.000	1.03			50.1	SURCHARGED	

©1982-2020 Innovyze

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.
S4.001	SW22	15 Summer	100	+40%	100/15 Summer			
S1.016	SW23	15 Summer	100	+40%	100/15 Summer			
S1.017	SW24	960 Summer	100	+40%	100/15 Summer			
S1.018	SW25	960 Summer	100	+40%	100/15 Summer			
S5.000	HD26	15 Summer	100	+40%	100/15 Summer			
S6.000	HD27	15 Summer	100	+40%	100/15 Summer			
S5.001	HD28	15 Summer	100	+40%	30/15 Summer			
S5.002	SW29	15 Summer	100	+40%	100/15 Summer			
S7.000	SW30	15 Summer	100	+40%	100/15 Summer			
S7.001	SW31	15 Summer	100	+40%	30/15 Summer			
S5.003	SW32	15 Summer	100	+40%				
S8.000	SW34	15 Summer	100	+40%				
S8.001	SW35	15 Summer	100	+40%	100/15 Summer			
S8.002	SW36	15 Summer	100	+40%	100/15 Summer			
S9.000	SW38	15 Summer	100	+40%				
S9.001	SW39	15 Summer	100	+40%				
S9.002	SW40	15 Summer	100	+40%	100/15 Summer			
S8.003	SW41	15 Summer	100	+40%	100/15 Summer			
S5.004	SW42	15 Summer	100	+40%	100/15 Summer			
S10.000	SW43	15 Summer	100	+40%	100/15 Summer			
S10.001	SW44	15 Summer	100	+40%	100/15 Summer			
S5.005	SW45	960 Summer	100	+40%	30/15 Summer			
S5.006	SW46	960 Summer	100	+40%	100/15 Summer			
S1.019	SW47	960 Summer	100	+40%	1/15 Summer			
S1.020	SW48	1440 Winter	100	+40%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S4.001	SW22	108.015	0.335	0.000	1.10			82.2	SURCHARGED
S1.016	SW23	107.666	0.266	0.000	1.51			523.2	SURCHARGED
S1.017	SW24	107.389	0.089	0.000	0.14			66.6	SURCHARGED
S1.018	SW25	107.387	0.337	0.000	0.13			64.8	SURCHARGED
S5.000	HD26	110.926	0.776	0.000	0.67			30.9	SURCHARGED
S6.000	HD27	110.833	0.963	0.000	0.76			34.6	FLOOD RISK
S5.001	HD28	110.716	1.086	0.000	2.12			105.6	FLOOD RISK
S5.002	SW29	109.737	0.312	0.000	1.67			121.7	SURCHARGED
S7.000	SW30	109.888	0.273	0.000	0.81			42.8	SURCHARGED
S7.001	SW31	109.760	0.350	0.000	1.81			70.4	SURCHARGED
S5.003	SW32	109.116	-0.144	0.000	0.69			232.4	OK
S8.000	SW34	108.740	-0.090	0.000	0.66			44.2	OK
S8.001	SW35	108.538	0.198	0.000	0.66			63.5	SURCHARGED
S8.002	SW36	108.327	0.487	0.000	1.37			105.4	SURCHARGED
S9.000	SW38	109.459	-0.086	0.000	0.38			10.2	OK
S9.001	SW39	108.730	-0.060	0.000	0.66			54.6	OK
S9.002	SW40	108.492	0.367	0.000	1.07			99.3	SURCHARGED

©1982-2020 Innovyze

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 / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S8.003	SW41	108.072	0.382	0.000	1.30			205.6	SURCHARGED
S5.004	SW42	107.948	0.308	0.000	0.96			509.1	SURCHARGED
S10.000	SW43	107.808	0.243	0.000	0.88			23.0	SURCHARGED
S10.001	SW44	107.485	0.335	0.000	0.99			48.4	SURCHARGED
S5.005	SW45	107.388	0.368	0.000	0.23			54.8	SURCHARGED
S5.006	SW46	107.387	0.417	0.000	0.13			53.8	SURCHARGED
S1.019	SW47	107.387	1.037	0.000	0.54			9.8	SURCHARGED
S1.020	SW48	106.150	-0.100	0.000	0.24			9.9	OK

PN	US/MH Name	Level Exceeded
S4.001	SW22	
S1.016	SW23	
S1.017	SW24	
S1.018	SW25	
S5.000	HD26	
S6.000	HD27	
S5.001	HD28	
S5.002	SW29	
S7.000	SW30	
S7.001	SW31	
S5.003	SW32	
S8.000	SW34	
S8.001	SW35	
S8.002	SW36	
S9.000	SW38	
S9.001	SW39	
S9.002	SW40	
S8.003	SW41	
S5.004	SW42	
S10.000	SW43	
S10.001	SW44	
S5.005	SW45	
S5.006	SW46	
S1.019	SW47	
S1.020	SW48	

©1982-2020 Innovyze