

Date 15/12/2021 02:47

File 211214 SW-FW.MDX

XP Solutions

Designed by andyj

Checked by

Network 2020.1



STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for S104 SW

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	30	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	100	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 S104 SW

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.578	4-8	0.333

Total Area Contributing (ha) = 0.911

Total Pipe Volume (m³) = 176.029

Network Design Table for S104 SW

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	7.434	0.150	49.6	0.018	4.00	0.0	0.600	o	100	Pipe/Conduit	
S1.001	7.269	0.073	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	4.121	0.170	24.2	0.036	4.00	0.0	0.600	o	100	Pipe/Conduit	
S2.001	5.469	0.168	32.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	31.213	0.078	400.0	0.051	0.00	0.0	0.600	o	900	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	100.00	4.11	65.100	0.018	0.0	0.0	0.0	1.10	8.6	4.9
S1.001	100.00	4.12	64.900	0.000	4.0	0.0	0.0	1.00	17.8	4.0
S2.000	100.00	4.04	64.950	0.036	0.0	0.0	0.0	1.57	12.4	9.7
S2.001	100.00	4.05	64.730	0.000	6.0	0.0	0.0	1.77	31.3	6.0
S1.002	100.00	4.45	63.812	0.051	10.0	0.0	0.0	1.56	992.7	23.8



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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
S3.000	8.744	0.230	38.0	0.037	4.00	0.0	0.600	o	150	Pipe/Conduit	🏡
S3.001	5.305	0.106	50.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🏡
S1.003	15.606	0.039	400.1	0.020	0.00	0.0	0.600	o	900	Pipe/Conduit	🏡
S4.000	5.234	0.096	54.5	0.030	4.00	0.0	0.600	o	100	Pipe/Conduit	🏡
S4.001	5.919	0.059	100.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🏡
S1.004	13.276	0.033	400.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	🏡
S5.000	6.786	0.072	94.3	0.026	4.00	0.0	0.600	o	150	Pipe/Conduit	🏡
S5.001	6.630	0.066	100.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🏡
S1.005	14.162	0.035	400.0	0.019	0.00	0.0	0.600	o	900	Pipe/Conduit	🏡
S6.000	3.287	0.032	102.7	0.035	4.00	0.0	0.600	o	150	Pipe/Conduit	🏡
S6.001	7.190	0.072	99.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🏡
S7.000	3.624	0.074	49.0	0.064	4.00	0.0	0.600	o	150	Pipe/Conduit	🏡
S7.001	6.004	0.060	100.1	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)
S3.000	100.00	4.09	64.870	0.037	0.0	0.0	0.0	1.64	28.9	10.0
S3.001	100.00	4.06	64.590	0.000	6.0	0.0	0.0	1.43	25.2	6.0
S1.003	100.00	4.62	63.734	0.071	16.0	0.0	0.0	1.56	992.5	35.2
S4.000	100.00	4.08	64.650	0.030	0.0	0.0	0.0	1.05	8.2	8.1
S4.001	100.00	4.10	64.504	0.000	8.0	0.0	0.0	1.00	17.7	8.0
S1.004	100.00	4.76	63.695	0.071	24.0	0.0	0.0	1.56	992.7	43.2
S5.000	100.00	4.11	64.600	0.026	0.0	0.0	0.0	1.04	18.3	7.0
S5.001	100.00	4.11	64.478	0.000	4.0	0.0	0.0	1.00	17.7	4.0
S1.005	100.00	4.91	63.662	0.090	28.0	0.0	0.0	1.56	992.7	52.4
S6.000	100.00	4.06	64.530	0.035	0.0	0.0	0.0	0.99	17.5	9.5
S6.001	100.00	4.12	64.448	0.000	8.0	0.0	0.0	1.01	17.8	8.0
S7.000	100.00	4.04	64.560	0.064	0.0	0.0	0.0	1.44	25.5	17.3
S7.001	100.00	4.10	64.436	0.000	14.0	0.0	0.0	1.00	17.8	14.0

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Network Design Table for S104 SW

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
S1.006	60.408	0.151	400.0	0.066	0.00	0.0	0.600	o	900	Pipe/Conduit	
S8.000	2.656	0.698	3.8	0.082	4.00	0.0	0.600	o	100	Pipe/Conduit	
S8.001	10.213	0.102	100.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S8.002	15.441	0.039	400.0	0.015	0.00	0.0	0.600	o	900	Pipe/Conduit	
S9.000	2.337	0.330	7.1	0.010	4.00	0.0	0.600	o	100	Pipe/Conduit	
S9.001	4.810	0.559	8.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S8.003	34.229	0.086	398.0	0.039	0.00	0.0	0.600	o	900	Pipe/Conduit	
S10.000	5.174	0.280	18.5	0.041	4.00	0.0	0.600	o	100	Pipe/Conduit	
S10.001	9.258	0.195	47.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S11.000	6.780	0.220	30.8	0.088	4.00	0.0	0.600	o	150	Pipe/Conduit	
S11.001	8.139	0.425	19.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.007	19.104	0.048	398.0	0.011	0.00	0.0	0.600	o	900	Pipe/Conduit	
S12.000	3.942	0.317	12.4	0.074	4.00	0.0	0.600	o	150	Pipe/Conduit	
S12.001	7.485	0.075	99.8	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)
S1.006	100.00	5.56	63.626	0.156	50.0	0.0	0.0	1.56	992.7	92.2
S8.000	100.00	4.01	65.200	0.082	0.0	0.0	0.0	3.99	31.4	22.2
S8.001	100.00	4.17	64.452	0.000	14.0	0.0	0.0	1.00	17.7	14.0
S8.002	100.00	4.33	63.600	0.015	14.0	0.0	0.0	1.56	992.7	18.1
S9.000	100.00	4.01	65.250	0.010	0.0	0.0	0.0	2.92	23.0	2.7
S9.001	100.00	4.02	64.870	0.000	2.0	0.0	0.0	3.46	61.1	2.0
S8.003	100.00	4.70	63.561	0.054	16.0	0.0	0.0	1.56	995.2	30.6
S10.000	100.00	4.05	64.750	0.041	0.0	0.0	0.0	1.81	14.2	11.1
S10.001	100.00	4.11	64.420	0.000	10.0	0.0	0.0	1.46	25.9	10.0
S11.000	100.00	4.06	64.920	0.088	0.0	0.0	0.0	1.82	32.2	23.8
S11.001	100.00	4.06	64.700	0.000	14.0	0.0	0.0	2.31	40.9	14.0
S1.007	100.00	5.76	63.475	0.221	90.0	0.0	0.0	1.56	995.2	149.9
S12.000	100.00	4.02	64.700	0.074	0.0	0.0	0.0	2.87	50.8	20.0
S12.001	100.00	4.12	64.383	0.000	16.0	0.0	0.0	1.01	17.8	16.0



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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
S13.000	2.852	0.400	7.1	0.020	4.00	0.0	0.600	o	100	Pipe/Conduit	
S13.001	4.417	0.342	12.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S12.002	32.261	0.081	400.0	0.060	0.00	0.0	0.600	o	900	Pipe/Conduit	
S1.008	11.506	0.029	396.8	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
S14.000	3.814	0.350	10.9	0.021	4.00	0.0	0.600	o	100	Pipe/Conduit	
S14.001	4.112	0.152	27.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.009	8.827	0.022	401.2	0.015	0.00	0.0	0.600	o	900	Pipe/Conduit	
S15.000	13.464	0.245	55.0	0.000	4.00	0.0	0.600	o	375	Pipe/Conduit	
S15.001	5.719	0.104	55.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.010	12.695	0.032	396.7	0.020	0.00	0.0	0.600	o	900	Pipe/Conduit	
S16.000	7.175	0.095	75.5	0.013	4.00	0.0	0.600	o	100	Pipe/Conduit	
S16.001	7.903	0.111	71.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.011	15.717	0.105	149.7	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)
S13.000	100.00	4.02	65.050	0.020	0.0	0.0	0.0	2.91	22.9	5.4
S13.001	100.00	4.03	64.600	0.000	4.0	0.0	0.0	2.82	49.8	4.0
S12.002	100.00	4.47	63.508	0.060	20.0	0.0	0.0	1.56	992.7	36.2
S1.008	100.00	5.88	63.427	0.281	110.0	0.0	0.0	1.57	996.8	186.1
S14.000	100.00	4.03	64.700	0.021	0.0	0.0	0.0	2.35	18.5	5.7
S14.001	100.00	4.04	64.300	0.000	4.0	0.0	0.0	1.94	34.3	4.0
S1.009	100.00	5.98	63.398	0.296	114.0	0.0	0.0	1.56	991.2	194.2
S15.000	100.00	4.09	64.250	0.000	0.0	0.0	0.0	2.45	270.4	0.0
S15.001	100.00	4.13	64.005	0.000	0.0	0.0	0.0	2.45	270.4	0.0
S1.010	100.00	6.11	63.376	0.316	114.0	0.0	0.0	1.57	996.8	199.6
S16.000	100.00	4.13	64.350	0.013	0.0	0.0	0.0	0.89	7.0	3.5
S16.001	100.00	4.11	64.205	0.000	2.0	0.0	0.0	1.19	21.1	2.0
S1.011	100.00	4.32	63.344	0.000	10.3	0.0	0.0	0.82	14.5	10.3

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PIPELINE SCHEDULES for S104 SW									
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)	
S1.005	o	900	S1.8	65.600	63.662	1.038	Open Manhole	2100	
S6.000	o	150	SFC6	65.700	64.530	1.020	Open Manhole	600	
S6.001	o	150	S1.9	65.700	64.448	1.102	Open Manhole	450	
S7.000	o	150	SFC7	65.560	64.560	0.850	Open Manhole	600	
S7.001	o	150	S1.10	65.570	64.436	0.984	Open Manhole	450	
S1.006	o	900	S1.11	65.500	63.626	0.974	Open Manhole	2100	
S8.000	o	100	SFC8	65.950	65.200	0.650	Open Manhole	600	
S8.001	o	150	S1.12	66.300	64.452	1.698	Open Manhole	450	
S8.002	o	900	S1.13	66.200	63.600	1.700	Open Manhole	2100	
S9.000	o	100	SFC9	66.250	65.250	0.900	Open Manhole	600	
S9.001	o	150	S1.14	66.220	64.870	1.200	Open Manhole	450	
S8.003	o	900	S1.15	66.000	63.561	1.539	Open Manhole	2100	
S10.000	o	100	SFC10	65.800	64.750	0.950	Open Manhole	600	
S10.001	o	150	S1.16	65.850	64.420	1.280	Open Manhole	450	
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)	
S1.005	14.162	400.0	S1.11	65.500	63.626	0.974	Open Manhole	2100	
S6.000	3.287	102.7	S1.9	65.700	64.498	1.052	Open Manhole	450	
S6.001	7.190	99.9	S1.11	65.500	64.376	0.974	Open Manhole	2100	
S7.000	3.624	49.0	S1.10	65.570	64.486	0.934	Open Manhole	450	
S7.001	6.004	100.1	S1.11	65.500	64.376	0.974	Open Manhole	2100	
S1.006	60.408	400.0	S1.18	65.800	63.475	1.425	Open Manhole	2400	
S8.000	2.656	3.8	S1.12	66.300	64.502	1.698	Open Manhole	450	
S8.001	10.213	100.1	S1.13	66.200	64.350	1.700	Open Manhole	2100	
S8.002	15.441	400.0	S1.15	66.000	63.561	1.539	Open Manhole	2100	
S9.000	2.337	7.1	S1.14	66.220	64.920	1.200	Open Manhole	450	
S9.001	4.810	8.6	S1.15	66.000	64.311	1.539	Open Manhole	2100	
S8.003	34.229	398.0	S1.18	65.800	63.475	1.425	Open Manhole	2400	
S10.000	5.174	18.5	S1.16	65.850	64.470	1.280	Open Manhole	450	
S10.001	9.258	47.5	S1.18	65.800	64.225	1.425	Open Manhole	2400	
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PIPELINE SCHEDULES for S104 SW

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)
S15.000	o	375	STANK	65.600	64.250	0.975	Open Manhole	1500
S15.001	o	375	S1.25	65.500	64.005	1.120	Open Manhole	1500
S1.010	o	900	S1.26	65.300	63.376	1.024	Open Manhole	2100
S16.000	o	100	SFC15	65.300	64.350	0.850	Open Manhole	600
S16.001	o	150	S1.27	65.250	64.205	0.895	Open Manhole	450
S1.011	o	150	S1.28	65.100	63.344	1.606	Open Manhole	2100

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)
S15.000	13.464	55.0	S1.25	65.500	64.005	1.120	Open Manhole	1500
S15.001	5.719	55.0	S1.26	65.300	63.901	1.024	Open Manhole	2100
S1.010	12.695	396.7	S1.28	65.100	63.344	0.856	Open Manhole	2100
S16.000	7.175	75.5	S1.27	65.250	64.255	0.895	Open Manhole	450
S16.001	7.903	71.2	S1.28	65.100	64.094	0.856	Open Manhole	2100
S1.011	15.717	149.7	S	65.250	63.239	1.861	Open Manhole	0

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Area Summary for S104 SW

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.018	0.018	0.018
1.001	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.036	0.036	0.036
2.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.051	0.051	0.051
3.000	-	-	100	0.037	0.037	0.037
3.001	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.020	0.020	0.020
4.000	-	-	100	0.030	0.030	0.030
4.001	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.026	0.026	0.026
5.001	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.019	0.019	0.019
6.000	-	-	100	0.035	0.035	0.035
6.001	-	-	100	0.000	0.000	0.000
7.000	-	-	100	0.064	0.064	0.064
7.001	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.066	0.066	0.066
8.000	-	-	100	0.082	0.082	0.082
8.001	-	-	100	0.000	0.000	0.000
8.002	-	-	100	0.015	0.015	0.015
9.000	-	-	100	0.010	0.010	0.010
9.001	-	-	100	0.000	0.000	0.000
8.003	-	-	100	0.039	0.039	0.039
10.000	-	-	100	0.041	0.041	0.041
10.001	-	-	100	0.000	0.000	0.000
11.000	-	-	100	0.088	0.088	0.088
11.001	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.011	0.011	0.011
12.000	-	-	100	0.074	0.074	0.074
12.001	-	-	100	0.000	0.000	0.000
13.000	-	-	100	0.020	0.020	0.020
13.001	-	-	100	0.000	0.000	0.000
12.002	-	-	100	0.060	0.060	0.060
1.008	-	-	100	0.000	0.000	0.000
14.000	-	-	100	0.021	0.021	0.021
14.001	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.015	0.015	0.015
15.000	-	-	100	0.000	0.000	0.000
15.001	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.020	0.020	0.020
16.000	-	-	100	0.013	0.013	0.013
16.001	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.911	0.911	0.911

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XP Solutions	Network 2020.1	
<u>Online Controls for S104 SW</u> <u>Orifice Manhole: S1.0, DS/PN: S1.001, Volume (m³): 0.3</u> Diameter (m) 0.052 Discharge Coefficient 0.600 Invert Level (m) 64.900 <u>Orifice Manhole: S1.1, DS/PN: S2.001, Volume (m³): 0.3</u> Diameter (m) 0.064 Discharge Coefficient 0.600 Invert Level (m) 64.730 <u>Orifice Manhole: S1.3, DS/PN: S3.001, Volume (m³): 0.4</u> Diameter (m) 0.064 Discharge Coefficient 0.600 Invert Level (m) 64.590 <u>Orifice Manhole: S1.5, DS/PN: S4.001, Volume (m³): 0.2</u> Diameter (m) 0.075 Discharge Coefficient 0.600 Invert Level (m) 64.504 <u>Orifice Manhole: S1.7, DS/PN: S5.001, Volume (m³): 0.3</u> Diameter (m) 0.052 Discharge Coefficient 0.600 Invert Level (m) 64.478 <u>Orifice Manhole: S1.9, DS/PN: S6.001, Volume (m³): 0.2</u> Diameter (m) 0.075 Discharge Coefficient 0.600 Invert Level (m) 64.448 <u>Orifice Manhole: S1.10, DS/PN: S7.001, Volume (m³): 0.2</u> Diameter (m) 0.099 Discharge Coefficient 0.600 Invert Level (m) 64.436 <u>Orifice Manhole: S1.12, DS/PN: S8.001, Volume (m³): 0.3</u> Diameter (m) 0.099 Discharge Coefficient 0.600 Invert Level (m) 64.452 <u>Orifice Manhole: S1.14, DS/PN: S9.001, Volume (m³): 0.2</u> Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 64.870 <u>Orifice Manhole: S1.16, DS/PN: S10.001, Volume (m³): 0.3</u> Diameter (m) 0.084 Discharge Coefficient 0.600 Invert Level (m) 64.420 <u>Orifice Manhole: S1.17, DS/PN: S11.001, Volume (m³): 0.3</u> Diameter (m) 0.099 Discharge Coefficient 0.600 Invert Level (m) 64.700		
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		Page 12																																																																																																																								
																																																																																																																										
Date 15/12/2021 02:47	Designed by andyj																																																																																																																									
File 211214 SW-FW.MDX	Checked by																																																																																																																									
XP Solutions	Network 2020.1																																																																																																																									
 <u>Orifice Manhole: S1.19, DS/PN: S12.001, Volume (m³): 0.3</u> Diameter (m) 0.107 Discharge Coefficient 0.600 Invert Level (m) 64.383 <u>Orifice Manhole: S1.20, DS/PN: S13.001, Volume (m³): 0.2</u> Diameter (m) 0.052 Discharge Coefficient 0.600 Invert Level (m) 64.600 <u>Orifice Manhole: S1.23, DS/PN: S14.001, Volume (m³): 0.2</u> Diameter (m) 0.052 Discharge Coefficient 0.600 Invert Level (m) 64.300 <u>Orifice Manhole: S1.27, DS/PN: S16.001, Volume (m³): 0.2</u> Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 64.205 <u>Hydro-Brake® Optimum Manhole: S1.28, DS/PN: S1.011, Volume (m³): 12.9</u> <table><tr><td>Unit Reference</td><td colspan="2">MD-SHE-0136-1040-1850-1040</td></tr><tr><td>Design Head (m)</td><td colspan="2">1.850</td></tr><tr><td>Design Flow (l/s)</td><td colspan="2">10.4</td></tr><tr><td>Flush-Flo™</td><td colspan="2">Calculated</td></tr><tr><td>Objective</td><td colspan="2">Minimise upstream storage</td></tr><tr><td>Application</td><td colspan="2">Surface</td></tr><tr><td>Sump Available</td><td colspan="2">Yes</td></tr><tr><td>Diameter (mm)</td><td colspan="2">136</td></tr><tr><td>Invert Level (m)</td><td colspan="2">63.344</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td colspan="2">150</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td colspan="2">1500</td></tr></table> <table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>1.850</td><td>10.4</td></tr><tr><td>Flush-Flo™</td><td>0.541</td><td>10.4</td></tr><tr><td>Kick-Flo®</td><td>1.122</td><td>8.2</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>9.1</td></tr></table> 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 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>4.9</td><td>1.200</td><td>8.5</td><td>3.000</td><td>13.1</td><td>7.000</td><td>19.6</td></tr><tr><td>0.200</td><td>8.9</td><td>1.400</td><td>9.1</td><td>3.500</td><td>14.1</td><td>7.500</td><td>20.2</td></tr><tr><td>0.300</td><td>9.8</td><td>1.600</td><td>9.7</td><td>4.000</td><td>15.0</td><td>8.000</td><td>20.9</td></tr><tr><td>0.400</td><td>10.2</td><td>1.800</td><td>10.3</td><td>4.500</td><td>15.8</td><td>8.500</td><td>21.5</td></tr><tr><td>0.500</td><td>10.4</td><td>2.000</td><td>10.8</td><td>5.000</td><td>16.7</td><td>9.000</td><td>22.1</td></tr><tr><td>0.600</td><td>10.4</td><td>2.200</td><td>11.3</td><td>5.500</td><td>17.4</td><td>9.500</td><td>22.7</td></tr><tr><td>0.800</td><td>10.1</td><td>2.400</td><td>11.8</td><td>6.000</td><td>18.2</td><td></td><td></td></tr><tr><td>1.000</td><td>9.2</td><td>2.600</td><td>12.2</td><td>6.500</td><td>18.9</td><td></td><td></td></tr></table>			Unit Reference	MD-SHE-0136-1040-1850-1040		Design Head (m)	1.850		Design Flow (l/s)	10.4		Flush-Flo™	Calculated		Objective	Minimise upstream storage		Application	Surface		Sump Available	Yes		Diameter (mm)	136		Invert Level (m)	63.344		Minimum Outlet Pipe Diameter (mm)	150		Suggested Manhole Diameter (mm)	1500		Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.850	10.4	Flush-Flo™	0.541	10.4	Kick-Flo®	1.122	8.2	Mean Flow over Head Range	-	9.1	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	4.9	1.200	8.5	3.000	13.1	7.000	19.6	0.200	8.9	1.400	9.1	3.500	14.1	7.500	20.2	0.300	9.8	1.600	9.7	4.000	15.0	8.000	20.9	0.400	10.2	1.800	10.3	4.500	15.8	8.500	21.5	0.500	10.4	2.000	10.8	5.000	16.7	9.000	22.1	0.600	10.4	2.200	11.3	5.500	17.4	9.500	22.7	0.800	10.1	2.400	11.8	6.000	18.2			1.000	9.2	2.600	12.2	6.500	18.9		
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0.100	4.9	1.200	8.5	3.000	13.1	7.000	19.6																																																																																																																			
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0.300	9.8	1.600	9.7	4.000	15.0	8.000	20.9																																																																																																																			
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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for S104 SW

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
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	16
Number of Online Controls	16	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	0.359
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

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

Profile(s)	Summer	Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440	
Return Period(s) (years)	2, 30, 100	
Climate Change (%)	0, 0, 30	

									Water
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow Overflow	Overflow Act.	Level (m)
S1.000	SFC1	15	Winter	2	+0%	30/15	Summer		65.189
S1.001	S1.0	15	Winter	2	+0%	2/15	Summer		65.169
S2.000	SFC2	15	Winter	2	+0%	2/15	Summer		65.232
S2.001	S1.1	15	Winter	2	+0%	2/15	Summer		65.182
S1.002	S1.2	15	Winter	2	+0%	100/60	Winter		63.910
S3.000	SFC3	1440	Winter	2	+0%				64.673
S3.001	S1.3	720	Summer	2	+0%	100/60	Winter		64.591
S1.003	S1.4	120	Winter	2	+0%	100/60	Summer		63.899
S4.000	SFC4	15	Winter	2	+0%	30/15	Summer		64.750
S4.001	S1.5	15	Winter	2	+0%	2/15	Summer		64.704
S1.004	S1.6	120	Winter	2	+0%	100/30	Winter		63.899
S5.000	SFC5	15	Winter	2	+0%	2/15	Summer		64.897
S5.001	S1.7	15	Winter	2	+0%	2/15	Summer		64.888
S1.005	S1.8	120	Winter	2	+0%	100/30	Winter		63.898
S6.000	SFC6	15	Winter	2	+0%	2/15	Summer		64.730
S6.001	S1.9	15	Winter	2	+0%	2/15	Summer		64.722
S7.000	SFC7	15	Winter	2	+0%	2/15	Summer		64.775
S7.001	S1.10	15	Winter	2	+0%	2/15	Summer		64.753

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for S104 SW

PN	US/MH Name	Surcharged		Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow	Volume						
S1.000	SFC1	-0.011	0.000	0.36				3	2.8	OK	
S1.001	S1.0	0.119	0.000	0.18					2.8	SURCHARGED	
S2.000	SFC2	0.182	0.000	0.52				3	5.5	SURCHARGED	
S2.001	S1.1	0.302	0.000	0.21					5.5	SURCHARGED	
S1.002	S1.2	-0.802	0.000	0.02					14.7	OK	
S3.000	SFC3	-0.347	0.000	0.00					0.0	OK	
S3.001	S1.3	-0.149	0.000	0.00					0.0	OK	
S1.003	S1.4	-0.735	0.000	0.01					6.3	OK	
S4.000	SFC4	0.000	0.000	0.64				3	4.6	OK	
S4.001	S1.5	0.050	0.000	0.32					4.7	SURCHARGED	
S1.004	S1.6	-0.696	0.000	0.02					7.7	OK	
S5.000	SFC5	0.147	0.000	0.24				3	3.8	SURCHARGED	
S5.001	S1.7	0.260	0.000	0.23					3.4	SURCHARGED	
S1.005	S1.8	-0.663	0.000	0.02					9.5	OK	
S6.000	SFC6	0.050	0.000	0.50				3	5.6	SURCHARGED	
S6.001	S1.9	0.124	0.000	0.36					5.5	SURCHARGED	
S7.000	SFC7	0.065	0.000	0.61				3	10.5	SURCHARGED	
S7.001	S1.10	0.167	0.000	0.70					10.3	SURCHARGED	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for S104 SW

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.006	S1.11	120 Winter	2	+0%	100/30	Winter		
S8.000	SFC8	1440 Winter	2	+0%				
S8.001	S1.12	960 Summer	2	+0%	100/30	Winter		
S8.002	S1.13	120 Winter	2	+0%	100/30	Winter		
S9.000	SFC9	1440 Winter	2	+0%				
S9.001	S1.14	1440 Winter	2	+0%	100/30	Winter		
S8.003	S1.15	120 Winter	2	+0%	100/30	Winter		
S10.000	SFC10	15 Winter	2	+0%	30/15	Summer		
S10.001	S1.16	15 Winter	2	+0%	2/15	Summer		
S11.000	SFC11	15 Winter	2	+0%	2/15	Summer		
S11.001	S1.17	15 Winter	2	+0%	2/15	Summer		
S1.007	S1.18	120 Winter	2	+0%	100/30	Summer		
S12.000	SFC12	15 Winter	2	+0%	30/15	Summer		
S12.001	S1.19	15 Summer	2	+0%	2/15	Summer		
S13.000	SFC13	30 Winter	2	+0%	30/15	Summer		
S13.001	S1.20	30 Winter	2	+0%	2/15	Winter		
S12.002	S1.21	120 Winter	2	+0%	100/30	Summer		
S1.008	S1.22	120 Winter	2	+0%	100/30	Summer		
S14.000	SFC14	15 Winter	2	+0%	30/15	Summer		
S14.001	S1.23	15 Winter	2	+0%	2/15	Summer		
S1.009	S1.24	120 Winter	2	+0%	100/30	Summer		
S15.000	STANK	15 Summer	2	+0%	100/60	Winter		
S15.001	S1.25	15 Summer	2	+0%	100/30	Summer		
S1.010	S1.26	120 Winter	2	+0%	30/120	Winter		
S16.000	SFC15	15 Winter	2	+0%	2/15	Summer		
S16.001	S1.27	15 Winter	2	+0%	2/15	Summer		
S1.011	S1.28	120 Winter	2	+0%	2/15	Summer		

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)		Overflow (l/s)	Time (mins)	
S1.006	S1.11	63.898	-0.628	0.000	0.02		17.1	OK
S8.000	SFC8	64.930	-0.370	0.000	0.00		0.0	OK
S8.001	S1.12	64.454	-0.148	0.000	0.00		0.0	OK
S8.002	S1.13	63.898	-0.602	0.000	0.00		0.4	OK
S9.000	SFC9	65.251	-0.099	0.000	0.00		0.0	OK
S9.001	S1.14	64.882	-0.138	0.000	0.00		0.0	OK
S8.003	S1.15	63.898	-0.563	0.000	0.00		1.3	OK
S10.000	SFC10	64.803	-0.047	0.000	0.55	5	6.8	OK
S10.001	S1.16	64.680	0.110	0.000	0.30		6.8	SURCHARGED
S11.000	SFC11	65.295	0.225	0.000	0.51	3	14.0	SURCHARGED
S11.001	S1.17	65.235	0.385	0.000	0.39		13.9	SURCHARGED
S1.007	S1.18	63.898	-0.477	0.000	0.02		13.8	OK
S12.000	SFC12	64.761	-0.089	0.000	0.35	5	12.4	OK
S12.001	S1.19	64.709	0.176	0.000	0.81		12.4	SURCHARGED
S13.000	SFC13	65.080	-0.070	0.000	0.14	7	2.4	OK



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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for S104 SW

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
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	16
Number of Online Controls	16	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	0.359
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

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

Profile(s)	Summer	Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440	
Return Period(s) (years)	2, 30, 100	
Climate Change (%)	0, 0, 30	

									Water
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
S1.000	SFC1	15	Winter	30	+0%	30/15	Summer		65.653
S1.001	S1.0	15	Summer	30	+0%	2/15	Summer		65.603
S2.000	SFC2	15	Winter	30	+0%	2/15	Summer		65.499
S2.001	S1.1	15	Winter	30	+0%	2/15	Summer		65.426
S1.002	S1.2	120	Winter	30	+0%	100/60	Winter		64.281
S3.000	SFC3	1440	Winter	30	+0%				64.883
S3.001	S1.3	960	Winter	30	+0%	100/60	Winter		64.624
S1.003	S1.4	120	Winter	30	+0%	100/60	Summer		64.281
S4.000	SFC4	15	Winter	30	+0%	30/15	Summer		65.181
S4.001	S1.5	15	Winter	30	+0%	2/15	Summer		65.051
S1.004	S1.6	120	Winter	30	+0%	100/30	Winter		64.281
S5.000	SFC5	15	Winter	30	+0%	2/15	Summer		65.147
S5.001	S1.7	15	Winter	30	+0%	2/15	Summer		65.274
S1.005	S1.8	120	Winter	30	+0%	100/30	Winter		64.281
S6.000	SFC6	15	Winter	30	+0%	2/15	Summer		65.280
S6.001	S1.9	15	Winter	30	+0%	2/15	Summer		65.260
S7.000	SFC7	15	Winter	30	+0%	2/15	Summer		65.104
S7.001	S1.10	15	Summer	30	+0%	2/15	Summer		65.052

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PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)		
S1.000	SFC1	0.453	0.000	0.60			3	4.7	SURCHARGED
S1.001	S1.0	0.553	0.000	0.30				4.6	SURCHARGED
S2.000	SFC2	0.449	0.000	0.66			4	7.0	SURCHARGED
S2.001	S1.1	0.546	0.000	0.27				7.0	SURCHARGED
S1.002	S1.2	-0.431	0.000	0.01				9.6	OK
S3.000	SFC3	-0.137	0.000	0.02				0.4	OK
S3.001	S1.3	-0.116	0.000	0.02				0.4	OK
S1.003	S1.4	-0.353	0.000	0.02				8.8	OK
S4.000	SFC4	0.431	0.000	1.16			4	8.4	SURCHARGED
S4.001	S1.5	0.397	0.000	0.57				8.4	SURCHARGED
S1.004	S1.6	-0.314	0.000	0.02				9.8	OK
S5.000	SFC5	0.397	0.000	0.34			5	5.2	SURCHARGED
S5.001	S1.7	0.646	0.000	0.30				4.5	SURCHARGED
S1.005	S1.8	-0.281	0.000	0.02				11.9	OK
S6.000	SFC6	0.600	0.000	0.91			4	10.2	SURCHARGED
S6.001	S1.9	0.662	0.000	0.67				10.2	SURCHARGED
S7.000	SFC7	0.394	0.000	0.85			4	14.5	SURCHARGED
S7.001	S1.10	0.466	0.000	0.97				14.4	SURCHARGED



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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for S104 SW

	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow
PN	Name	Storm		Period	Change	Surcharge	Flood	Overflow	Act.
S1.006	S1.11	120	Winter	30	+0%	100/30	Winter		
S8.000	SFC8	1440	Winter	30	+0%				
S8.001	S1.12	1440	Winter	30	+0%	100/30	Winter		
S8.002	S1.13	120	Winter	30	+0%	100/30	Winter		
S9.000	SFC9	240	Winter	30	+0%				
S9.001	S1.14	240	Winter	30	+0%	100/30	Winter		
S8.003	S1.15	120	Winter	30	+0%	100/30	Winter		
S10.000	SFC10	15	Winter	30	+0%	30/15	Summer		
S10.001	S1.16	15	Winter	30	+0%	2/15	Summer		
S11.000	SFC11	15	Winter	30	+0%	2/15	Summer		
S11.001	S1.17	15	Winter	30	+0%	2/15	Summer		
S1.007	S1.18	120	Winter	30	+0%	100/30	Summer		
S12.000	SFC12	15	Winter	30	+0%	30/15	Summer		
S12.001	S1.19	15	Winter	30	+0%	2/15	Summer		
S13.000	SFC13	15	Winter	30	+0%	30/15	Summer		
S13.001	S1.20	15	Winter	30	+0%	2/15	Winter		
S12.002	S1.21	120	Winter	30	+0%	100/30	Summer		
S1.008	S1.22	120	Winter	30	+0%	100/30	Summer		
S14.000	SFC14	15	Winter	30	+0%	30/15	Summer		
S14.001	S1.23	15	Summer	30	+0%	2/15	Summer		
S1.009	S1.24	120	Winter	30	+0%	100/30	Summer		
S15.000	STANK	120	Winter	30	+0%	100/60	Winter		
S15.001	S1.25	120	Winter	30	+0%	100/30	Summer		
S1.010	S1.26	120	Winter	30	+0%	30/120	Winter		
S16.000	SFC15	15	Winter	30	+0%	2/15	Summer		
S16.001	S1.27	15	Winter	30	+0%	2/15	Summer		
S1.011	S1.28	120	Winter	30	+0%	2/15	Summer		

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Half	Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)		Overflow (l/s)	Time (mins)	Flow (l/s)	
S1.006	S1.11	64.281	-0.245	0.000	0.03			23.4	OK
S8.000	SFC8	65.204	-0.096	0.000	0.01			0.2	OK
S8.001	S1.12	64.474	-0.128	0.000	0.01			0.2	OK
S8.002	S1.13	64.281	-0.219	0.000	0.00			0.6	OK
S9.000	SFC9	65.261	-0.089	0.000	0.03			0.4	OK
S9.001	S1.14	64.916	-0.104	0.000	0.01			0.4	OK
S8.003	S1.15	64.281	-0.180	0.000	0.00			1.3	OK
S10.000	SFC10	65.332	0.482	0.000	0.94		3	11.6	SURCHARGED
S10.001	S1.16	65.086	0.516	0.000	0.51			11.6	SURCHARGED
S11.000	SFC11	65.554	0.484	0.000	0.63		4	17.3	SURCHARGED
S11.001	S1.17	65.466	0.616	0.000	0.49			17.3	SURCHARGED
S1.007	S1.18	64.281	-0.094	0.000	0.02			14.8	OK
S12.000	SFC12	65.190	0.340	0.000	0.52		3	18.3	SURCHARGED
S12.001	S1.19	65.105	0.572	0.000	1.19			18.2	SURCHARGED
S13.000	SFC13	65.473	0.323	0.000	0.29		3	5.1	SURCHARGED

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for S104 SW

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)	
S13.001	S1.20	65.438	0.688	0.000	0.14			5.0	SURCHARGED
S12.002	S1.21	64.280	-0.128	0.000	0.02			14.4	OK
S1.008	S1.22	64.280	-0.047	0.000	0.03			14.0	OK
S14.000	SFC14	65.233	0.433	0.000	0.34		3	5.4	SURCHARGED
S14.001	S1.23	65.195	0.745	0.000	0.21			5.2	SURCHARGED
S1.009	S1.24	64.280	-0.018	0.000	0.03			13.8	OK
S15.000	STANK	64.279	-0.346	0.000	0.00		10	0.1	OK
S15.001	S1.25	64.279	-0.101	0.000	0.00			0.3	OK
S1.010	S1.26	64.279	0.003	0.000	0.03			12.9	SURCHARGED
S16.000	SFC15	64.845	0.395	0.000	0.39		5	2.5	SURCHARGED
S16.001	S1.27	64.836	0.481	0.000	0.12			2.2	SURCHARGED
S1.011	S1.28	64.279	0.785	0.000	0.77			10.4	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.006	S1.11	
S8.000	SFC8	
S8.001	S1.12	
S8.002	S1.13	
S9.000	SFC9	
S9.001	S1.14	
S8.003	S1.15	
S10.000	SFC10	
S10.001	S1.16	
S11.000	SFC11	
S11.001	S1.17	
S1.007	S1.18	
S12.000	SFC12	
S12.001	S1.19	
S13.000	SFC13	
S13.001	S1.20	
S12.002	S1.21	
S1.008	S1.22	
S14.000	SFC14	
S14.001	S1.23	
S1.009	S1.24	
S15.000	STANK	
S15.001	S1.25	
S1.010	S1.26	
S16.000	SFC15	
S16.001	S1.27	
S1.011	S1.28	



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100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for S104 SW

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
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	16
Number of Online Controls	16	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	0.359
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

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

Profile(s)	Summer	Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440	
Return Period(s) (years)	2, 30, 100	
Climate Change (%)	0, 0, 30	

									Water
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)
S1.000	SFC1	15 Winter	100	+30%	30/15 Summer				65.716
S1.001	S1.0	15 Winter	100	+30%	2/15 Summer				65.659
S2.000	SFC2	15 Winter	100	+30%	2/15 Summer				65.557
S2.001	S1.1	15 Winter	100	+30%	2/15 Summer				65.477
S1.002	S1.2	240 Winter	100	+30%	100/60 Winter				64.949
S3.000	SFC3	240 Winter	100	+30%					64.966
S3.001	S1.3	240 Winter	100	+30%	100/60 Winter				64.965
S1.003	S1.4	240 Winter	100	+30%	100/60 Summer				64.949
S4.000	SFC4	15 Winter	100	+30%	30/15 Summer				65.205
S4.001	S1.5	15 Winter	100	+30%	2/15 Summer				65.071
S1.004	S1.6	240 Winter	100	+30%	100/30 Winter				64.949
S5.000	SFC5	30 Winter	100	+30%	2/15 Summer				65.198
S5.001	S1.7	15 Winter	100	+30%	2/15 Summer				65.332
S1.005	S1.8	240 Winter	100	+30%	100/30 Winter				64.949
S6.000	SFC6	15 Winter	100	+30%	2/15 Summer				65.321
S6.001	S1.9	15 Winter	100	+30%	2/15 Summer				65.344
S7.000	SFC7	15 Winter	100	+30%	2/15 Summer				65.162
S7.001	S1.10	15 Winter	100	+30%	2/15 Summer				65.103

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for S104 SW

PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)				Flow (l/s)		
S1.000	SFC1	0.516	0.000	0.62		6	4.8	SURCHARGED	
S1.001	S1.0	0.609	0.000	0.32			4.8	SURCHARGED	
S2.000	SFC2	0.507	0.000	0.69		7	7.2	SURCHARGED	
S2.001	S1.1	0.597	0.000	0.28			7.2	SURCHARGED	
S1.002	S1.2	0.237	0.000	0.01			9.7	SURCHARGED	
S3.000	SFC3	-0.054	0.000	0.12			3.1	OK	
S3.001	S1.3	0.225	0.000	0.15			3.0	SURCHARGED	
S1.003	S1.4	0.315	0.000	0.02			12.8	SURCHARGED	
S4.000	SFC4	0.455	0.000	1.18		5	8.5	SURCHARGED	
S4.001	S1.5	0.417	0.000	0.58			8.5	SURCHARGED	
S1.004	S1.6	0.355	0.000	0.03			15.2	SURCHARGED	
S5.000	SFC5	0.448	0.000	0.35		11	5.5	SURCHARGED	
S5.001	S1.7	0.704	0.000	0.31			4.6	SURCHARGED	
S1.005	S1.8	0.388	0.000	0.04			18.8	SURCHARGED	
S6.000	SFC6	0.641	0.000	0.96		5	10.8	SURCHARGED	
S6.001	S1.9	0.746	0.000	0.68			10.4	SURCHARGED	
S7.000	SFC7	0.452	0.000	0.89		7	15.2	SURCHARGED	
S7.001	S1.10	0.517	0.000	1.02			15.2	SURCHARGED	



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100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for S104 SW

									Water
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
S1.006	S1.11	240	Winter	100	+30%	100/30	Winter		64.950
S8.000	SFC8	600	Winter	100	+30%				65.226
S8.001	S1.12	240	Winter	100	+30%	100/30	Winter		64.965
S8.002	S1.13	240	Winter	100	+30%	100/30	Winter		64.950
S9.000	SFC9	60	Winter	100	+30%				65.317
S9.001	S1.14	60	Winter	100	+30%	100/30	Winter		65.312
S8.003	S1.15	240	Winter	100	+30%	100/30	Winter		64.950
S10.000	SFC10	15	Winter	100	+30%	30/15	Summer		65.390
S10.001	S1.16	15	Winter	100	+30%	2/15	Summer		65.128
S11.000	SFC11	15	Winter	100	+30%	2/15	Summer		65.625
S11.001	S1.17	15	Winter	100	+30%	2/15	Summer		65.529
S1.007	S1.18	240	Winter	100	+30%	100/30	Summer		64.950
S12.000	SFC12	15	Winter	100	+30%	30/15	Summer		65.252
S12.001	S1.19	15	Winter	100	+30%	2/15	Summer		65.160
S13.000	SFC13	15	Winter	100	+30%	30/15	Summer		65.595
S13.001	S1.20	15	Summer	100	+30%	2/15	Winter		65.563
S12.002	S1.21	240	Winter	100	+30%	100/30	Summer		64.949
S1.008	S1.22	240	Winter	100	+30%	100/30	Summer		64.949
S14.000	SFC14	15	Winter	100	+30%	30/15	Summer		65.286
S14.001	S1.23	15	Winter	100	+30%	2/15	Summer		65.244
S1.009	S1.24	240	Winter	100	+30%	100/30	Summer		64.948
S15.000	STANK	240	Winter	100	+30%	100/60	Winter		64.948
S15.001	S1.25	240	Winter	100	+30%	100/30	Summer		64.948
S1.010	S1.26	240	Winter	100	+30%	30/120	Winter		64.948
S16.000	SFC15	240	Winter	100	+30%	2/15	Summer		64.928
S16.001	S1.27	240	Winter	100	+30%	2/15	Summer		64.928
S1.011	S1.28	240	Winter	100	+30%	2/15	Summer		64.947

		Surcharged		Flooded		Half Drain		Pipe			
	US/MH	Depth	Volume	Flow /	Overflow	Time	Flow			Level	
PN	Name	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)	Status		Exceeded	
S1.006	S1.11	0.424	0.000	0.04			31.6	SURCHARGED			
S8.000	SFC8	-0.074	0.000	0.13			3.1	OK			
S8.001	S1.12	0.363	0.000	0.13			2.1	SURCHARGED			
S8.002	S1.13	0.450	0.000	0.00			2.2	SURCHARGED			
S9.000	SFC9	-0.033	0.000	0.13			2.1	OK			
S9.001	S1.14	0.292	0.000	0.04			1.9	SURCHARGED			
S8.003	S1.15	0.489	0.000	0.01			5.0	SURCHARGED			
S10.000	SFC10	0.540	0.000	0.97		5	12.0	SURCHARGED			
S10.001	S1.16	0.558	0.000	0.53			12.0	SURCHARGED			
S11.000	SFC11	0.555	0.000	0.66		7	18.1	SURCHARGED			
S11.001	S1.17	0.679	0.000	0.51			18.1	SURCHARGED			
S1.007	S1.18	0.575	0.000	0.07			47.6	SURCHARGED			
S12.000	SFC12	0.402	0.000	0.54		6	19.0	SURCHARGED			
S12.001	S1.19	0.627	0.000	1.24			19.0	SURCHARGED			
S13.000	SFC13	0.445	0.000	0.34		5	6.0	SURCHARGED			

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for S104 SW

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S13.001	S1.20	0.813	0.000	0.15		5.4	SURCHARGED	
S12.002	S1.21	0.541	0.000	0.02		14.8	SURCHARGED	
S1.008	S1.22	0.622	0.000	0.12		59.8	SURCHARGED	
S14.000	SFC14	0.486	0.000	0.36	6	5.5	SURCHARGED	
S14.001	S1.23	0.794	0.000	0.22		5.4	SURCHARGED	
S1.009	S1.24	0.651	0.000	0.14		62.6	SURCHARGED	
S15.000	STANK	0.323	0.000	0.04	153	7.2	SURCHARGED	
S15.001	S1.25	0.568	0.000	0.06		7.3	SURCHARGED	
S1.010	S1.26	0.672	0.000	0.02		12.0	SURCHARGED	
S16.000	SFC15	0.478	0.000	0.20	50	1.3	SURCHARGED	
S16.001	S1.27	0.573	0.000	0.07		1.2	SURCHARGED	
S1.011	S1.28	1.453	0.000	0.77		10.4	FLOOD RISK	