STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	45
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.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 2

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.657	4-8	0.673

Total Area Contributing (ha) = 1.330

Total Pipe Volume (m³) = 49.986

Network Design Table for Surface Network 2

« - 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
1.000	41.521	1.236	33.6	0.138	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	33.238	1.415	23.5	0.009	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	12.240	0.083	147.5	0.120	5.00	0.0	0.600	o	300	Pipe/Conduit	
2.001	29.085	0.065	447.5	0.034	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.31	118.671	0.138	0.0	0.0	8.4	2.26	90.1	27.1
1.001	50.00	5.48	117.360	0.147	0.0	0.0	9.0	3.26	230.3	28.9
2.000	50.00	5.16	116.168	0.120	0.0	0.0	7.3	1.29	91.4	23.6
2.001	50.00	5.73	116.010	0.154	0.0	0.0	9.4	0.85	93.9	30.2

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Network Design Table for Surface Network 2

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
3.000	30.149	0.099	304.5	0.092	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	18.416	0.045	409.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	14.964	0.125	119.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	59.786	3.685	16.2	0.012	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	38.390	2.119	18.1	0.106	5.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	32.211	0.622	51.8	0.126	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.001	6.699	0.306	21.9	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.002	12.351	0.584	21.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	19.584	0.190	103.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.006	11.047	0.500	22.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.007	14.467	0.075	192.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
6.000	35.818	2.496	14.4	0.098	5.00	0.0	0.600	o	225	Pipe/Conduit	
7.000	13.063	0.065	201.0	0.040	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)
3.000	50.00	5.56	116.044	0.092	0.0	0.0	5.6	0.90	63.3	18.1
1.002	50.00	6.13	115.545	0.393	0.0	0.0	23.9	0.77	54.5«	77.2
1.003	50.00	6.30	115.500	0.393	0.0	0.0	23.9	1.44	101.5	77.2
1.004	50.00	6.55	115.375	0.405	0.0	0.0	24.7	3.92	277.3	79.5
4.000	50.00	5.21	114.849	0.106	0.0	0.0	6.5	3.09	122.8	20.8
5.000	50.00	5.29	113.352	0.126	0.0	0.0	7.7	1.82	72.4	24.7
4.001	50.00	5.33	112.655	0.289	0.0	0.0	17.6	3.37	238.6	56.7
4.002	50.00	5.39	112.349	0.289	0.0	0.0	17.6	3.43	242.7	56.7
1.005	50.00	6.74	111.690	0.694	0.0	0.0	42.3	1.78	197.1	136.3
1.006	50.00	6.78	111.500	0.694	0.0	0.0	42.3	3.87	427.4	136.3
1.007	50.00	6.97	111.000	0.694	0.0	0.0	42.3	1.30	143.7	136.3
6.000	50.00	5.17	114.804	0.098	0.0	0.0	6.0	3.47	138.1	19.2
7.000	50.00	5.24	112.373	0.040	0.0	0.0	2.4	0.92	36.5	7.9

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Network Design Table for Surface Network 2

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
6.001	46.211	0.231	200.0	0.147	0.00	0.0	0.600	o	375	Pipe/Conduit	
8.000	12.844	1.384	9.3	0.078	5.00	0.0	0.600	o	300	Pipe/Conduit	
6.002	29.515	0.148	199.4	0.030	0.00	0.0	0.600	o	375	Pipe/Conduit	
6.003	18.788	0.479	39.2	0.058	0.00	0.0	0.600	o	375	Pipe/Conduit	
6.004	22.318	0.375	59.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
9.000	21.641	0.175	123.7	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit	
9.001	10.908	0.055	198.3	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.002	14.365	0.072	199.5	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.003	9.717	0.049	198.3	0.006	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.000	26.355	1.483	17.8	0.069	5.00	0.0	0.600	o	225	Pipe/Conduit	
9.004	24.042	0.100	240.4	0.010	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	20.191	0.150	134.6	0.023	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	20.924	0.200	104.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.010	11.310	2.850	4.0	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)
6.001	50.00	5.84	112.158	0.285	0.0	0.0	17.4	1.28	141.1	56.0
8.000	50.00	5.04	113.386	0.078	0.0	0.0	4.8	5.19	366.9	15.3
6.002	50.00	6.22	111.927	0.393	0.0	0.0	23.9	1.28	141.3	77.2
6.003	50.00	6.33	111.779	0.451	0.0	0.0	27.5	2.90	320.4	88.6
6.004	50.00	6.49	111.300	0.451	0.0	0.0	27.5	2.35	259.8	88.6
9.000	50.00	5.40	111.600	0.033	0.0	0.0	2.0	0.90	15.9	6.5
9.001	50.00	5.60	111.350	0.050	0.0	0.0	3.0	0.92	36.8	9.8
9.002	50.00	5.86	111.295	0.077	0.0	0.0	4.7	0.92	36.7	15.1
9.003	50.00	6.03	111.224	0.083	0.0	0.0	5.1	0.92	36.8	16.3
10.000	50.00	5.14	112.658	0.069	0.0	0.0	4.2	3.12	124.0	13.5
9.004	50.00	6.43	111.100	0.162	0.0	0.0	9.9	1.01	71.4	31.8
1.008	50.00	7.16	110.850	1.330	0.0	0.0	81.0	1.75	278.4	261.1
1.009	50.00	7.52	110.700	1.330	0.0	0.0	81.0	0.98	17.4«	261.1
1.010	50.00	7.55	110.500	1.330	0.0	0.0	81.0	5.10	90.0«	261.1

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Manhole Schedules for Surface Network 2

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)
S13	119.970	1.299	Open Manhole	1350	1.000	118.671	225				
S14	119.550	2.190	Open Manhole	1350	1.001	117.360	300	1.000	117.435	225	
S15	117.417	1.249	Open Manhole	1350	2.000	116.168	300				
S16	117.281	1.271	Open Manhole	1350	2.001	116.010	375	2.000	116.085	300	
S17	117.469	1.425	Open Manhole	1350	3.000	116.044	300				
S18	117.650	2.105	Open Manhole	1350	1.002	115.545	300	1.001	115.945	300	400
								2.001	115.945	375	475
								3.000	115.945	300	400
S57	117.700	2.200	Open Manhole	1350	1.003	115.500	300	1.002	115.500	300	
S19	116.800	1.425	Open Manhole	1350	1.004	115.375	300	1.003	115.375	300	
S27	116.342	1.493	Open Manhole	1350	4.000	114.849	225				
S28	115.008	1.656	Open Manhole	1350	5.000	113.352	225				
S29	114.722	2.067	Open Manhole	1200	4.001	112.655	300	4.000	112.730	225	
								5.000	112.730	225	
S59	114.480	2.131	Open Manhole	1200	4.002	112.349	300	4.001	112.349	300	
S30	114.469	2.779	Open Manhole	1350	1.005	111.690	375	1.004	111.690	300	
								4.002	111.765	300	
S69	112.900	1.400	Open Manhole	1350	1.006	111.500	375	1.005	111.500	375	
S70	112.350	1.350	Open Manhole	1350	1.007	111.000	375	1.006	111.000	375	
S20	116.311	1.507	Open Manhole	1350	6.000	114.804	225				
S21	113.888	1.515	Open Manhole	1350	7.000	112.373	225				
S23	113.950	1.792	Open Manhole	1350	6.001	112.158	375	6.000	112.308	225	
								7.000	112.308	225	
S24	115.186	1.800	Open Manhole	1350	8.000	113.386	300				
S25	114.622	2.695	Open Manhole	1200	6.002	111.927	375	6.001	111.927	375	
								8.000	112.002	300	
S26	114.517	2.738	Open Manhole	1200	6.003	111.779	375	6.002	111.779	375	
S58	112.700	1.400	Open Manhole	1350	6.004	111.300	375	6.003	111.300	375	
S74	112.582	0.982	Open Manhole	1350	9.000	111.600	150				
S73	112.674	1.324	Open Manhole	1350	9.001	111.350	225	9.000	111.425	150	
S72	112.709	1.414	Open Manhole	1350	9.002	111.295	225	9.001	111.295	225	
S71	113.074	1.851	Open Manhole	1200	9.003	111.224	225	9.002	111.223	225	
S75	114.083	1.425	Open Manhole	1350	10.000	112.658	225				
S31	113.313	2.213	Open Manhole	1200	9.004	111.100	300	9.003	111.175	225	
								10.000	111.175	225	
S32	112.350	1.500	Open Manhole	1350	1.008	110.850	450	1.007	110.925	375	
								6.004	110.925	375	
								9.004	111.000	300	

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Manhole Schedules for Surface Network 2

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)
S33	112.400	1.700	Open Manhole	1200	1.009	110.700	150	1.008	110.700	450	
S34	112.200	1.700	Open Manhole	1200	1.010	110.500	150	1.009	110.500	150	
S76	108.030	0.380	Open Manhole	1350		OUTFALL		1.010	107.650	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S13	537377.110	132998.617	537377.110	132998.617	Required	
S14	537360.843	132960.415	537360.843	132960.415	Required	
S15	537310.920	132986.334	537310.920	132986.334	Required	
S16	537307.284	132974.647	537307.284	132974.647	Required	
S17	537305.100	132934.964	537305.100	132934.964	Required	
S18	537328.156	132954.390	537328.156	132954.390	Required	
S57	537310.486	132959.580	537310.486	132959.580	Required	
S19	537296.689	132965.373	537296.689	132965.373	Required	
S27	537282.735	132959.559	537282.735	132959.559	Required	
S28	537242.065	132930.767	537242.065	132930.767	Required	
S29	537244.489	132962.886	537244.489	132962.886	Required	
S59	537239.999	132967.856	537239.999	132967.856	Required	

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Manhole Schedules for Surface Network 2

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S30	537238.757	132980.145	537238.757	132980.145	Required	
S69	537220.057	132974.326	537220.057	132974.326	Required	
S70	537210.189	132979.291	537210.189	132979.291	Required	
S20	537303.881	133044.785	537303.881	133044.785	Required	
S21	537277.012	133071.515	537277.012	133071.515	Required	
S23	537271.338	133059.748	537271.338	133059.748	Required	
S24	537263.273	133012.778	537263.273	133012.778	Required	
S25	537251.537	133017.994	537251.537	133017.994	Required	
S26	537240.171	132990.755	537240.171	132990.755	Required	
S58	537222.271	132985.047	537222.271	132985.047	Required	
S74	537190.082	132920.614	537190.082	132920.614	Required	
S73	537192.051	132942.166	537192.051	132942.166	Required	
S72	537183.505	132948.944	537183.505	132948.944	Required	
S71	537190.350	132961.574	537190.350	132961.574	Required	
S75	537225.267	132964.355	537225.267	132964.355	Required	

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Manhole Schedules for Surface Network 2

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S31	537198.967	132966.063	537198.967	132966.063	Required	
S32	537200.522	132990.054	537200.522	132990.054	Required	
S33	537182.360	132998.877	537182.360	132998.877	Required	
S34	537182.913	133019.793	537182.913	133019.793	Required	
S76	537171.603	133019.893			No Entry	

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PIPELINE SCHEDULES for Surface Network 2

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)
1.000	o	225	S13	119.970	118.671	1.074	Open Manhole	1350
1.001	o	300	S14	119.550	117.360	1.890	Open Manhole	1350
2.000	o	300	S15	117.417	116.168	0.949	Open Manhole	1350
2.001	o	375	S16	117.281	116.010	0.896	Open Manhole	1350
3.000	o	300	S17	117.469	116.044	1.125	Open Manhole	1350
1.002	o	300	S18	117.650	115.545	1.805	Open Manhole	1350
1.003	o	300	S57	117.700	115.500	1.900	Open Manhole	1350
1.004	o	300	S19	116.800	115.375	1.125	Open Manhole	1350
4.000	o	225	S27	116.342	114.849	1.268	Open Manhole	1350
5.000	o	225	S28	115.008	113.352	1.431	Open Manhole	1350
4.001	o	300	S29	114.722	112.655	1.767	Open Manhole	1200
4.002	o	300	S59	114.480	112.349	1.831	Open Manhole	1200
1.005	o	375	S30	114.469	111.690	2.404	Open Manhole	1350
1.006	o	375	S69	112.900	111.500	1.025	Open Manhole	1350

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)
1.000	41.521	33.6	S14	119.550	117.435	1.890	Open Manhole	1350
1.001	33.238	23.5	S18	117.650	115.945	1.405	Open Manhole	1350
2.000	12.240	147.5	S16	117.281	116.085	0.896	Open Manhole	1350
2.001	29.085	447.5	S18	117.650	115.945	1.330	Open Manhole	1350
3.000	30.149	304.5	S18	117.650	115.945	1.405	Open Manhole	1350
1.002	18.416	409.2	S57	117.700	115.500	1.900	Open Manhole	1350
1.003	14.964	119.7	S19	116.800	115.375	1.125	Open Manhole	1350
1.004	59.786	16.2	S30	114.469	111.690	2.479	Open Manhole	1350
4.000	38.390	18.1	S29	114.722	112.730	1.767	Open Manhole	1200
5.000	32.211	51.8	S29	114.722	112.730	1.767	Open Manhole	1200
4.001	6.699	21.9	S59	114.480	112.349	1.831	Open Manhole	1200
4.002	12.351	21.1	S30	114.469	111.765	2.404	Open Manhole	1350
1.005	19.584	103.1	S69	112.900	111.500	1.025	Open Manhole	1350
1.006	11.047	22.1	S70	112.350	111.000	0.975	Open Manhole	1350

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PIPELINE SCHEDULES for Surface Network 2

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)
1.007	o	375	S70	112.350	111.000	0.975	Open Manhole	1350
6.000	o	225	S20	116.311	114.804	1.282	Open Manhole	1350
7.000	o	225	S21	113.888	112.373	1.290	Open Manhole	1350
6.001	o	375	S23	113.950	112.158	1.417	Open Manhole	1350
8.000	o	300	S24	115.186	113.386	1.500	Open Manhole	1350
6.002	o	375	S25	114.622	111.927	2.320	Open Manhole	1200
6.003	o	375	S26	114.517	111.779	2.363	Open Manhole	1200
6.004	o	375	S58	112.700	111.300	1.025	Open Manhole	1350
9.000	o	150	S74	112.582	111.600	0.832	Open Manhole	1350
9.001	o	225	S73	112.674	111.350	1.099	Open Manhole	1350
9.002	o	225	S72	112.709	111.295	1.189	Open Manhole	1350
9.003	o	225	S71	113.074	111.224	1.625	Open Manhole	1200
10.000	o	225	S75	114.083	112.658	1.200	Open Manhole	1350

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)
1.007	14.467	192.9	S32	112.350	110.925	1.050	Open Manhole	1350
6.000	35.818	14.4	S23	113.950	112.308	1.417	Open Manhole	1350
7.000	13.063	201.0	S23	113.950	112.308	1.417	Open Manhole	1350
6.001	46.211	200.0	S25	114.622	111.927	2.320	Open Manhole	1200
8.000	12.844	9.3	S25	114.622	112.002	2.320	Open Manhole	1200
6.002	29.515	199.4	S26	114.517	111.779	2.363	Open Manhole	1200
6.003	18.788	39.2	S58	112.700	111.300	1.025	Open Manhole	1350
6.004	22.318	59.5	S32	112.350	110.925	1.050	Open Manhole	1350
9.000	21.641	123.7	S73	112.674	111.425	1.099	Open Manhole	1350
9.001	10.908	198.3	S72	112.709	111.295	1.189	Open Manhole	1350
9.002	14.365	199.5	S71	113.074	111.223	1.626	Open Manhole	1200
9.003	9.717	198.3	S31	113.313	111.175	1.913	Open Manhole	1200
10.000	26.355	17.8	S31	113.313	111.175	1.913	Open Manhole	1200

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PIPELINE SCHEDULES for Surface Network 2

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)
9.004	o	300	S31	113.313	111.100	1.913	Open Manhole	1200
1.008	o	450	S32	112.350	110.850	1.050	Open Manhole	1350
1.009	o	150	S33	112.400	110.700	1.550	Open Manhole	1200
1.010	o	150	S34	112.200	110.500	1.550	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)
9.004	24.042	240.4	S32	112.350	111.000	1.050	Open Manhole	1350
1.008	20.191	134.6	S33	112.400	110.700	1.250	Open Manhole	1200
1.009	20.924	104.6	S34	112.200	110.500	1.550	Open Manhole	1200
1.010	11.310	4.0	S76	108.030	107.650	0.230	Open Manhole	1350

Free Flowing Outfall Details for Surface Network 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.010	S76	108.030	107.650	0.000	1350	0

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Online Controls for Surface Network 2

Hydro-Brake® Optimum Manhole: S57, DS/PN: 1.003, Volume (m³): 4.4

Unit Reference	MD-SHE-0077-3300-1700-3300
Design Head (m)	1.700
Design Flow (l/s)	3.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	77
Invert Level (m)	115.500
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.700	3.3
Flush-Flo™	0.338	2.7
Kick-Flo®	0.687	2.2
Mean Flow over Head Range	-	2.6

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	2.2	1.200	2.8	3.000	4.3	7.000	6.4
0.200	2.6	1.400	3.0	3.500	4.6	7.500	6.6
0.300	2.7	1.600	3.2	4.000	4.9	8.000	6.8
0.400	2.7	1.800	3.4	4.500	5.2	8.500	7.0
0.500	2.6	2.000	3.6	5.000	5.4	9.000	7.2
0.600	2.5	2.200	3.7	5.500	5.7	9.500	7.4
0.800	2.3	2.400	3.9	6.000	5.9		
1.000	2.6	2.600	4.0	6.500	6.2		

Hydro-Brake® Optimum Manhole: S33, DS/PN: 1.009, Volume (m³): 4.9

Unit Reference	MD-SHE-0126-8200-1500-8200
Design Head (m)	1.500
Design Flow (l/s)	8.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	126
Invert Level (m)	110.700
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

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Hydro-Brake® Optimum Manhole: S33, DS/PN: 1.009, Volume (m³): 4.9

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	8.2
Flush-Flo™	0.439	8.2
Kick-Flo®	0.922	6.5
Mean Flow over Head Range	-	7.2

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.5	1.200	7.4	3.000	11.4	7.000	17.0
0.200	7.4	1.400	7.9	3.500	12.2	7.500	17.6
0.300	8.0	1.600	8.4	4.000	13.0	8.000	18.1
0.400	8.2	1.800	8.9	4.500	13.8	8.500	18.7
0.500	8.2	2.000	9.4	5.000	14.5	9.000	19.2
0.600	8.0	2.200	9.8	5.500	15.2	9.500	19.7
0.800	7.4	2.400	10.2	6.000	15.8		
1.000	6.8	2.600	10.6	6.500	16.4		

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Storage Structures for Surface Network 2

Complex Manhole: S18, DS/PN: 1.002

Cellular Storage

Invert Level (m) 115.545 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	165.0	165.0	1.300	0.1	209.2
0.100	165.0	170.1	1.400	0.1	209.4
0.200	165.0	175.3	1.500	0.1	209.5
0.300	165.0	180.4	1.600	0.1	209.6
0.400	165.0	185.6	1.700	0.1	209.7
0.500	165.0	190.7	1.800	0.1	209.9
0.600	165.0	195.8	1.900	0.1	210.0
0.700	165.0	201.0	2.000	0.1	210.1
0.800	165.0	206.1	2.100	0.1	210.3
0.900	0.1	208.7	2.200	0.1	210.4
1.000	0.1	208.9	2.300	0.1	210.5
1.100	0.1	209.0	2.400	0.1	210.6
1.200	0.1	209.1	2.500	0.1	210.8

Infiltration Blanket

Infiltration Coefficient Base (m/hr) 0.00000 Diameter/Width (m) 10.0
Safety Factor 2.0 Length (m) 12.5
Porosity 0.30 Cap Volume Depth (m) 1.000
Invert Level (m) 116.345

Tank or Pond

Invert Level (m) 116.695

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	250.4	0.301	315.1	0.601	384.7	0.901	459.1
0.101	271.4	0.401	337.8	0.701	409.0	1.000	484.8
0.201	293.0	0.501	361.0	0.801	433.8	1.001	485.0

Tank or Pond Manhole: S32, DS/PN: 1.008

Invert Level (m) 110.850

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	346.8	0.201	394.0	0.401	443.5	0.601	495.2
0.101	370.1	0.301	418.4	0.501	469.0	0.701	521.9

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Tank or Pond Manhole: S32, DS/PN: 1.008

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.801	549.1	1.101	634.3	1.401	724.5		
0.901	576.9	1.201	663.8	1.500	755.3		
1.001	605.3	1.301	693.8	1.501	755.7		

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

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 2
Number of Online Controls 2 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) 1.000

Margin for Flood Risk Warning (mm) 450.0
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, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S13	15 Summer	1	+0%	100/15 Summer			
1.001	S14	15 Summer	1	+0%				
2.000	S15	15 Summer	1	+0%	30/15 Summer			
2.001	S16	15 Summer	1	+0%	30/60 Summer			
3.000	S17	15 Summer	1	+0%	30/60 Summer			
1.002	S18	240 Summer	1	+0%	1/240 Summer			
1.003	S57	240 Summer	1	+0%	1/60 Summer			
1.004	S19	30 Summer	1	+0%				
4.000	S27	15 Summer	1	+0%				
5.000	S28	15 Summer	1	+0%	30/15 Summer			
4.001	S29	15 Summer	1	+0%	30/15 Summer			
4.002	S59	15 Summer	1	+0%	100/15 Summer			
1.005	S30	15 Summer	1	+0%	30/15 Summer			
1.006	S69	15 Summer	1	+0%	30/360 Summer			
1.007	S70	15 Summer	1	+0%	30/15 Summer			
6.000	S20	15 Summer	1	+0%				
7.000	S21	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
6.001	S23	15 Summer	1	+0%	30/15 Summer			
8.000	S24	15 Summer	1	+0%				

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

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
1.000	S13	118.753	-0.143	0.000	0.28			24.2	OK
1.001	S14	117.430	-0.230	0.000	0.12			25.6	OK
2.000	S15	116.279	-0.189	0.000	0.29			21.2	OK
2.001	S16	116.156	-0.229	0.000	0.32			26.3	OK
3.000	S17	116.153	-0.191	0.000	0.28			16.3	OK
1.002	S18	115.857	0.012	0.000	0.09		205	4.0	SURCHARGED
1.003	S57	115.910	0.110	0.000	0.03			2.7	SURCHARGED
1.004	S19	115.397	-0.278	0.000	0.02			4.0	OK
4.000	S27	114.909	-0.165	0.000	0.16			18.8	OK
5.000	S28	113.441	-0.136	0.000	0.32			22.0	OK
4.001	S29	112.779	-0.176	0.000	0.35			48.9	OK
4.002	S59	112.453	-0.196	0.000	0.26			49.2	OK
1.005	S30	111.836	-0.229	0.000	0.32			52.8	OK
1.006	S69	111.610	-0.265	0.000	0.19			52.7	OK
1.007	S70	111.186	-0.189	0.000	0.49			52.3	OK
6.000	S20	114.859	-0.170	0.000	0.13			17.3	OK
7.000	S21	112.445	-0.153	0.000	0.22			7.0	OK
6.001	S23	112.313	-0.220	0.000	0.35			45.6	OK
8.000	S24	113.428	-0.258	0.000	0.05			13.8	OK

PN	US/MH Name	Level Exceeded
1.000	S13	
1.001	S14	
2.000	S15	
2.001	S16	
3.000	S17	
1.002	S18	
1.003	S57	
1.004	S19	
4.000	S27	
5.000	S28	
4.001	S29	
4.002	S59	
1.005	S30	
1.006	S69	
1.007	S70	
6.000	S20	
7.000	S21	1
6.001	S23	
8.000	S24	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
6.002	S25	15 Summer	1	+0%	30/15 Summer				112.116
6.003	S26	15 Summer	1	+0%	100/15 Summer				111.911
6.004	S58	15 Summer	1	+0%	30/15 Summer				111.446
9.000	S74	15 Summer	1	+0%	30/15 Summer				111.665
9.001	S73	15 Summer	1	+0%	30/15 Summer				111.430
9.002	S72	15 Summer	1	+0%	30/15 Summer				111.392
9.003	S71	15 Summer	1	+0%	30/15 Summer				111.327
10.000	S75	15 Summer	1	+0%					112.707
9.004	S31	15 Summer	1	+0%	30/15 Summer				111.235
1.008	S32	240 Summer	1	+0%	30/15 Summer				111.159
1.009	S33	240 Summer	1	+0%	1/15 Summer				111.156
1.010	S34	960 Summer	1	+0%					110.532

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
6.002	S25	-0.186	0.000	0.50			62.3	OK	
6.003	S26	-0.243	0.000	0.26			70.0	OK	
6.004	S58	-0.229	0.000	0.32			70.5	OK	
9.000	S74	-0.085	0.000	0.38			5.8	OK	
9.001	S73	-0.145	0.000	0.27			8.3	OK	
9.002	S72	-0.128	0.000	0.38			12.2	OK	
9.003	S71	-0.122	0.000	0.43			13.1	OK	
10.000	S75	-0.176	0.000	0.11			12.2	OK	
9.004	S31	-0.165	0.000	0.42			26.4	OK	
1.008	S32	-0.141	0.000	0.04			9.0	OK	
1.009	S33	0.306	0.000	0.50			8.2	SURCHARGED	
1.010	S34	-0.118	0.000	0.10			8.2	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

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 2
Number of Online Controls 2 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) 1.000

Margin for Flood Risk Warning (mm) 450.0
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, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S13	15 Summer	30	+35%	100/15 Summer			
1.001	S14	15 Summer	30	+35%				
2.000	S15	480 Winter	30	+35%	30/15 Summer			
2.001	S16	480 Winter	30	+35%	30/60 Summer			
3.000	S17	480 Winter	30	+35%	30/60 Summer			
1.002	S18	480 Winter	30	+35%	1/240 Summer			
1.003	S57	480 Winter	30	+35%	1/60 Summer			
1.004	S19	15 Summer	30	+35%				
4.000	S27	15 Summer	30	+35%				
5.000	S28	15 Summer	30	+35%	30/15 Summer			
4.001	S29	15 Summer	30	+35%	30/15 Summer			
4.002	S59	15 Summer	30	+35%	100/15 Summer			
1.005	S30	15 Summer	30	+35%	30/15 Summer			
1.006	S69	480 Winter	30	+35%	30/360 Summer			
1.007	S70	480 Winter	30	+35%	30/15 Summer			
6.000	S20	15 Summer	30	+35%				
7.000	S21	15 Summer	30	+35%	30/15 Summer	100/15 Summer		
6.001	S23	15 Summer	30	+35%	30/15 Summer			
8.000	S24	15 Summer	30	+35%				

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

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
1.000	S13	118.845	-0.051	0.000	0.93			80.0	OK
1.001	S14	117.494	-0.166	0.000	0.40			85.2	OK
2.000	S15	116.839	0.371	0.000	0.10			7.3	SURCHARGED
2.001	S16	116.838	0.453	0.000	0.11			9.0	FLOOD RISK
3.000	S17	116.839	0.495	0.000	0.09			5.3	SURCHARGED
1.002	S18	116.838	0.993	0.000	0.11		683	5.0	SURCHARGED
1.003	S57	116.961	1.161	0.000	0.03			2.9	SURCHARGED
1.004	S19	115.413	-0.262	0.000	0.04			10.5	OK
4.000	S27	114.967	-0.107	0.000	0.53			62.2	OK
5.000	S28	113.747	0.170	0.000	1.04			70.9	SURCHARGED
4.001	S29	113.084	0.129	0.000	1.19			165.1	SURCHARGED
4.002	S59	112.566	-0.083	0.000	0.87			165.6	OK
1.005	S30	112.083	0.018	0.000	1.07			175.7	SURCHARGED
1.006	S69	111.901	0.026	0.000	0.08			20.8	SURCHARGED
1.007	S70	111.899	0.524	0.000	0.19			20.4	SURCHARGED
6.000	S20	114.909	-0.120	0.000	0.44			57.5	OK
7.000	S21	113.020	0.422	0.000	0.83			26.1	SURCHARGED
6.001	S23	112.982	0.449	0.000	1.23			159.5	SURCHARGED
8.000	S24	113.465	-0.221	0.000	0.16			45.8	OK

PN	US/MH Name	Level Exceeded
1.000	S13	
1.001	S14	
2.000	S15	
2.001	S16	
3.000	S17	
1.002	S18	
1.003	S57	
1.004	S19	
4.000	S27	
5.000	S28	
4.001	S29	
4.002	S59	
1.005	S30	
1.006	S69	
1.007	S70	
6.000	S20	
7.000	S21	1
6.001	S23	
8.000	S24	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
6.002	S25	15 Summer	30	+35%	30/15 Summer				112.601
6.003	S26	15 Summer	30	+35%	100/15 Summer				112.124
6.004	S58	480 Winter	30	+35%	30/15 Summer				111.898
9.000	S74	15 Summer	30	+35%	30/15 Summer				111.981
9.001	S73	480 Winter	30	+35%	30/15 Summer				111.899
9.002	S72	480 Winter	30	+35%	30/15 Summer				111.899
9.003	S71	480 Winter	30	+35%	30/15 Summer				111.898
10.000	S75	15 Summer	30	+35%					112.751
9.004	S31	480 Winter	30	+35%	30/15 Summer				111.898
1.008	S32	480 Winter	30	+35%	30/15 Summer				111.897
1.009	S33	480 Winter	30	+35%	1/15 Summer				111.920
1.010	S34	15 Summer	30	+35%					110.532

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
6.002	S25	0.299	0.000	1.74			216.6	SURCHARGED	
6.003	S26	-0.030	0.000	0.90			239.5	OK	
6.004	S58	0.223	0.000	0.12			27.2	SURCHARGED	
9.000	S74	0.231	0.000	1.15			17.4	SURCHARGED	
9.001	S73	0.324	0.000	0.10			3.0	SURCHARGED	
9.002	S72	0.379	0.000	0.14			4.6	SURCHARGED	
9.003	S71	0.449	0.000	0.16			4.9	SURCHARGED	
10.000	S75	-0.132	0.000	0.35			40.5	OK	
9.004	S31	0.498	0.000	0.15			9.6	SURCHARGED	
1.008	S32	0.597	0.000	0.04			9.6	SURCHARGED	
1.009	S33	1.070	0.000	0.50			8.2	SURCHARGED	
1.010	S34	-0.118	0.000	0.10			8.2	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

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 2
Number of Online Controls 2 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) 1.000

Margin for Flood Risk Warning (mm) 450.0
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, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S13	15 Summer	100	+45%	100/15 Summer			
1.001	S14	15 Summer	100	+45%				
2.000	S15	480 Winter	100	+45%	30/15 Summer			
2.001	S16	480 Winter	100	+45%	30/60 Summer			
3.000	S17	480 Winter	100	+45%	30/60 Summer			
1.002	S18	480 Winter	100	+45%	1/240 Summer			
1.003	S57	240 Summer	100	+45%	1/60 Summer			
1.004	S19	15 Summer	100	+45%				
4.000	S27	15 Summer	100	+45%				
5.000	S28	15 Summer	100	+45%	30/15 Summer			
4.001	S29	15 Summer	100	+45%	30/15 Summer			
4.002	S59	15 Summer	100	+45%	100/15 Summer			
1.005	S30	960 Winter	100	+45%	30/15 Summer			
1.006	S69	960 Winter	100	+45%	30/360 Summer			
1.007	S70	960 Winter	100	+45%	30/15 Summer			
6.000	S20	15 Summer	100	+45%				
7.000	S21	15 Summer	100	+45%	30/15 Summer	100/15 Summer		
6.001	S23	15 Summer	100	+45%	30/15 Summer			
8.000	S24	15 Summer	100	+45%				

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

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
1.000	S13	119.478	0.582	0.000	1.20			102.6	SURCHARGED
1.001	S14	117.514	-0.146	0.000	0.51			108.1	OK
2.000	S15	117.114	0.646	0.000	0.14			10.0	FLOOD RISK
2.001	S16	117.113	0.728	0.000	0.15			12.4	FLOOD RISK
3.000	S17	117.113	0.769	0.000	0.13			7.4	FLOOD RISK
1.002	S18	117.112	1.267	0.000	0.14		860	6.1	SURCHARGED
1.003	S57	117.386	1.586	0.000	0.04			3.1	FLOOD RISK
1.004	S19	115.419	-0.256	0.000	0.05			13.7	OK
4.000	S27	114.995	-0.079	0.000	0.75			86.7	OK
5.000	S28	114.795	1.218	0.000	1.35			91.8	FLOOD RISK
4.001	S29	113.673	0.718	0.000	1.53			211.9	SURCHARGED
4.002	S59	112.946	0.297	0.000	1.10			209.9	SURCHARGED
1.005	S30	112.253	0.188	0.000	0.11			17.4	SURCHARGED
1.006	S69	112.250	0.375	0.000	0.06			17.0	SURCHARGED
1.007	S70	112.248	0.873	0.000	0.16			16.8	FLOOD RISK
6.000	S20	114.933	-0.096	0.000	0.62			80.2	OK
7.000	S21	113.890	1.292	2.675	1.79			56.7	FLOOD
6.001	S23	113.909	1.376	0.000	1.48			191.8	FLOOD RISK
8.000	S24	113.508	-0.178	0.000	0.22			63.9	OK

PN	US/MH Name	Level Exceeded
1.000	S13	
1.001	S14	
2.000	S15	
2.001	S16	
3.000	S17	
1.002	S18	
1.003	S57	
1.004	S19	
4.000	S27	
5.000	S28	
4.001	S29	
4.002	S59	
1.005	S30	
1.006	S69	
1.007	S70	
6.000	S20	
7.000	S21	1
6.001	S23	
8.000	S24	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
6.002	S25	15 Summer	100	+45%	30/15 Summer				113.438
6.003	S26	15 Summer	100	+45%	100/15 Summer				112.736
6.004	S58	960 Winter	100	+45%	30/15 Summer				112.247
9.000	S74	15 Summer	100	+45%	30/15 Summer				112.471
9.001	S73	960 Winter	100	+45%	30/15 Summer				112.248
9.002	S72	960 Winter	100	+45%	30/15 Summer				112.248
9.003	S71	960 Winter	100	+45%	30/15 Summer				112.247
10.000	S75	15 Summer	100	+45%					112.770
9.004	S31	960 Winter	100	+45%	30/15 Summer				112.247
1.008	S32	960 Winter	100	+45%	30/15 Summer				112.246
1.009	S33	960 Winter	100	+45%	1/15 Summer				112.267
1.010	S34	960 Winter	100	+45%					110.532

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
6.002	S25	1.136	0.000	2.17			270.5	SURCHARGED	
6.003	S26	0.582	0.000	1.17			310.9	SURCHARGED	
6.004	S58	0.572	0.000	0.10			22.0	SURCHARGED	
9.000	S74	0.721	0.000	1.56			23.5	FLOOD RISK	
9.001	S73	0.673	0.000	0.07			2.1	FLOOD RISK	
9.002	S72	0.728	0.000	0.10			3.3	SURCHARGED	
9.003	S71	0.798	0.000	0.11			3.5	SURCHARGED	
10.000	S75	-0.113	0.000	0.49			56.5	OK	
9.004	S31	0.847	0.000	0.11			7.2	SURCHARGED	
1.008	S32	0.946	0.000	0.04			9.3	FLOOD RISK	
1.009	S33	1.417	0.000	0.51			8.3	FLOOD RISK	
1.010	S34	-0.118	0.000	0.10			8.3	OK	

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