CAPITA

Commercial in Confidence

Former Nestle Site, Hayes

Drainage Calculations - Revision D
29 November 2017

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Contents

Additional notes

1. **Runoff coefficient Cv has been updated from 0.75 (summer) and 0.84 (winter) to 0.925 (summer and winter) at LLFA's request.**

2. **Typically the additional temporary above ground ponding, as a result of the increased runoff coefficient Cv, will be stored in the dock loading areas.**

3. **The additional flooded volume in the Unit 1 car park will be stored within the permeable paving.**

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.614	4-8	2.053	8-12	1.379	12-16	0.080

Total Area Contributing (ha) = 4.126

Total Pipe Volume (m^3) = 272.248

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Existing Network Details 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
1.000	10.400	0.090	115.6	0.083	6.00	0.0	0.600	o	225	Pipe/Conduit
2.000	18.345	0.130	141.1	0.382	6.00	0.0	0.600	o	300	Pipe/Conduit
1.001	5.000	0.020	250.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
1.002	6.200	0.050	124.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
1.003	28.840	0.115	250.8	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
3.000	15.270	0.100	152.7	0.111	6.00	0.0	0.600	o	225	Pipe/Conduit
4.000	10.600	0.245	43.3	0.087	6.00	0.0	0.600	o	150	Pipe/Conduit
3.001	5.000	0.050	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
3.002	1.700	0.100	17.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
3.003	16.275	0.435	37.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.004	7.370	0.020	368.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit
5.000	8.905	0.360	24.7	0.188	6.00	0.0	0.600	o	225	Pipe/Conduit
6.000	8.845	0.135	65.5	0.185	6.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	29.475	0.083	0.0	1.22	48.3
2.000	29.440	0.382	0.0	1.32	93.4
1.001	29.235	0.465	0.0	1.14	126.1
1.002	29.215	0.465	0.0	1.63	179.6
1.003	29.165	0.465	0.0	1.14	125.9
3.000	29.885	0.111	0.0	1.06	42.0
4.000	30.105	0.087	0.0	1.53	27.1
3.001	29.785	0.198	0.0	1.31	52.0
3.002	29.735	0.198	0.0	3.19	126.8
3.003	29.635	0.198	0.0	2.15	85.3
1.004	28.975	0.663	0.0	1.05	167.5
5.000	29.960	0.188	0.0	2.64	105.0
6.000	29.735	0.185	0.0	1.62	64.3

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Existing Network Details 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
1.005	24.790	0.390	63.6	0.445	0.00	0.0	0.600	o	300	Pipe/Conduit
7.000	28.925	0.290	99.7	0.008	6.00	0.0	0.600	o	150	Pipe/Conduit
7.001	43.030	0.430	100.1	0.028	0.00	0.0	0.600	o	150	Pipe/Conduit
7.002	17.615	0.175	100.7	0.005	0.00	0.0	0.600	o	150	Pipe/Conduit
7.003	19.940	0.200	99.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
7.004	15.795	0.245	64.5	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit
8.000	13.810	0.140	98.6	0.011	6.00	0.0	0.600	o	150	Pipe/Conduit
8.001	19.215	0.190	101.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
8.002	29.465	0.295	99.9	0.017	0.00	0.0	0.600	o	150	Pipe/Conduit
8.003	16.420	0.165	99.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
8.004	18.340	0.375	48.9	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit
9.000	9.875	0.125	79.0	0.030	6.00	0.0	0.600	o	150	Pipe/Conduit
10.000	9.820	0.065	151.1	0.138	6.00	0.0	0.600	o	225	Pipe/Conduit
9.001	16.470	0.130	126.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
9.002	4.640	0.050	92.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
9.003	5.735	0.045	127.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.005	28.500	1.481	0.0	1.98	139.6
7.000	29.525	0.008	0.0	1.01	17.8
7.001	29.235	0.036	0.0	1.00	17.8
7.002	28.805	0.041	0.0	1.00	17.7
7.003	28.630	0.041	0.0	1.01	17.8
7.004	28.430	0.061	0.0	1.25	22.2
8.000	29.350	0.011	0.0	1.01	17.9
8.001	29.210	0.011	0.0	1.00	17.7
8.002	29.020	0.028	0.0	1.01	17.8
8.003	28.725	0.028	0.0	1.01	17.8
8.004	28.560	0.044	0.0	1.44	25.5
9.000	29.400	0.030	0.0	1.13	20.0
10.000	29.265	0.138	0.0	1.06	42.2
9.001	29.200	0.168	0.0	1.16	46.1
9.002	29.070	0.168	0.0	1.36	54.0
9.003	29.020	0.168	0.0	1.16	46.0

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Existing Network Details 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
11.000	40.400	0.270	149.6	0.178	6.00	0.0	0.600	o	225	Pipe/Conduit
11.001	16.960	0.135	125.6	0.201	0.00	0.0	0.600	o	300	Pipe/Conduit
9.004	21.055	0.140	150.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.006	60.000	0.000	0.0	0.092	0.00	0.0	0.600	o	1000	Pipe/Conduit
1.007	61.925	0.000	0.0	0.044	0.00	0.0	0.600	o	1000	Pipe/Conduit
1.008	80.780	0.000	0.0	0.102	0.00	0.0	0.600	o	1000	Pipe/Conduit
1.009	25.540	0.000	0.0	0.000	0.00	0.0	0.600	o	1000	Pipe/Conduit
12.000	12.495	0.125	100.0	0.028	6.00	0.0	0.600	o	150	Pipe/Conduit
13.000	8.740	0.065	134.5	0.150	6.00	0.0	0.600	o	225	Pipe/Conduit
12.001	5.955	0.050	119.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
12.002	4.640	0.050	92.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
12.003	6.365	0.050	127.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
12.004	11.645	0.095	122.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
12.005	47.635	0.240	198.5	0.103	0.00	0.0	0.600	o	300	Pipe/Conduit
14.000	11.050	0.140	78.9	0.069	6.00	0.0	0.600	o	150	Pipe/Conduit
14.001	8.275	0.105	78.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
11.000	29.625	0.178	0.0	1.07	42.4
11.001	29.280	0.379	0.0	1.40	99.1
9.004	28.250	0.547	0.0	1.06	42.3
1.006	27.335	2.225	0.0	0.00	0.0
1.007	27.335	2.269	0.0	0.00	0.0
1.008	27.335	2.371	0.0	0.00	0.0
1.009	27.335	2.371	0.0	0.00	0.0
12.000	29.400	0.028	0.0	1.01	17.8
13.000	29.265	0.150	0.0	1.13	44.8
12.001	29.200	0.178	0.0	1.20	47.6
12.002	29.150	0.178	0.0	1.36	54.0
12.003	29.100	0.178	0.0	1.16	46.0
12.004	29.050	0.178	0.0	1.18	46.9
12.005	28.880	0.281	0.0	1.11	78.6
14.000	29.115	0.069	0.0	1.13	20.0
14.001	28.975	0.069	0.0	1.13	20.0

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Existing Network Details 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
12.006	20.850	0.140	148.9	0.103	0.00	0.0	0.600	o	225	Pipe/Conduit
15.000	10.840	0.110	98.5	0.064	6.00	0.0	0.600	o	150	Pipe/Conduit
16.000	10.720	0.225	47.6	0.219	6.00	0.0	0.600	o	225	Pipe/Conduit
15.001	2.855	0.015	190.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
15.002	6.850	0.050	137.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
15.003	2.715	0.015	181.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
17.000	9.065	0.090	100.7	0.095	6.00	0.0	0.600	o	225	Pipe/Conduit
17.001	4.225	0.050	84.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
18.000	19.400	0.130	149.2	0.159	6.00	0.0	0.600	o	225	Pipe/Conduit
19.000	9.145	0.160	57.2	0.063	6.00	0.0	0.600	o	150	Pipe/Conduit
18.001	36.340	0.165	220.2	0.342	0.00	0.0	0.600	o	375	Pipe/Conduit
18.002	26.335	0.120	219.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
18.003	6.800	0.070	97.1	0.171	0.00	0.0	0.600	o	375	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
12.006	28.250	0.453	0.0	1.07	42.5
15.000	28.425	0.064	0.0	1.01	17.9
16.000	28.465	0.219	0.0	1.90	75.5
15.001	28.165	0.283	0.0	1.14	80.3
15.002	28.150	0.283	0.0	1.34	94.8
15.003	28.100	0.283	0.0	1.17	82.4
17.000	28.515	0.095	0.0	1.30	51.8
17.001	28.425	0.095	0.0	1.42	56.6
18.000	28.720	0.159	0.0	1.07	42.5
19.000	28.825	0.063	0.0	1.33	23.6
18.001	28.440	0.564	0.0	1.22	134.4
18.002	28.275	0.564	0.0	1.22	134.6
18.003	28.155	0.735	0.0	1.84	203.1

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Existing Network Details 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
15.004	15.480	0.115	134.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.010	55.650	0.000	0.0	0.113	0.00	0.0	0.600	o	1000	Pipe/Conduit
1.011	28.380	0.055	516.0	0.076	0.00	0.0	0.600	o	600	Pipe/Conduit
1.012	7.045	0.015	469.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit
1.013	5.250	0.100	52.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit
1.014	7.105	0.015	473.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
15.004	27.450	1.113	0.0	1.13	44.7
1.010	27.335	4.050	0.0	0.00	0.0
1.011	27.335	4.126	0.0	1.07	301.2
1.012	27.280	4.126	0.0	0.93	148.1
1.013	27.265	4.126	0.0	2.81	447.1
1.014	27.165	4.126	0.0	0.93	147.5

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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)
SP	29.925	0.450	Open Manhole	600 x 600	1.000	29.475	225				
SP	30.490	1.050	Open Manhole	600 x 600	2.000	29.440	300				
S46	31.075	1.840	Open Manhole	1500	1.001	29.235	375	1.000	29.385	225	
								2.000	29.310	300	
PI IN	31.075	1.860	Open Manhole	1500	1.002	29.215	375	1.001	29.215	375	
PI OUT	31.075	1.910	Open Manhole	1500	1.003	29.165	375	1.002	29.165	375	
SP	30.860	0.975	Open Manhole	600 x 600	3.000	29.885	225				
SP	31.005	0.900	Open Manhole	600 x 600	4.000	30.105	150				
S44	31.120	1.335	Open Manhole	1200	3.001	29.785	225	3.000	29.785	225	
								4.000	29.860	150	
PI IN	31.125	1.390	Open Manhole	1200	3.002	29.735	225	3.001	29.735	225	
PI OUT	31.125	1.490	Open Manhole	1200	3.003	29.635	225	3.002	29.635	225	
S45	31.145	2.170	Open Manhole	1500	1.004	28.975	450	1.003	29.050	375	
								3.003	29.200	225	
S43	31.185	1.225	Open Manhole	1200	5.000	29.960	225				
S41	30.960	1.225	Open Manhole	1200	6.000	29.735	225				
S42	30.980	2.480	Open Manhole	2100	1.005	28.500	300	1.004	28.955	450	605
								5.000	29.600	225	1025
								6.000	29.600	225	1025
S101	30.425	0.900	Open Manhole	600	7.000	29.525	150				
S102	30.410	1.175	Open Manhole	600	7.001	29.235	150	7.000	29.235	150	
S103	30.325	1.520	Open Manhole	600	7.002	28.805	150	7.001	28.805	150	
S104	30.350	1.720	Open Manhole	600	7.003	28.630	150	7.002	28.630	150	
S105	30.400	1.970	Open Manhole	600	7.004	28.430	150	7.003	28.430	150	
S106	30.250	0.900	Open Manhole	600	8.000	29.350	150				
S107	30.375	1.165	Open Manhole	600	8.001	29.210	150	8.000	29.210	150	
S108	30.375	1.355	Open Manhole	600	8.002	29.020	150	8.001	29.020	150	
S109	30.475	1.750	Open Manhole	600	8.003	28.725	150	8.002	28.725	150	
S110	30.485	1.925	Open Manhole	600	8.004	28.560	150	8.003	28.560	150	
SP	29.675	0.275	Open Manhole	600 x 600	9.000	29.400	150				
SP	30.240	0.975	Open Manhole	600 x 600	10.000	29.265	225				
S34	30.630	1.430	Open Manhole	1200	9.001	29.200	225	9.000	29.275	150	
								10.000	29.200	225	
PI IN	30.850	1.780	Open Manhole	1200	9.002	29.070	225	9.001	29.070	225	
PI OUT	30.850	1.830	Open Manhole	1200	9.003	29.020	225	9.002	29.020	225	
S31	30.850	1.225	Open Manhole	1200	11.000	29.625	225				
S32	30.850	1.570	Open Manhole	1500	11.001	29.280	300	11.000	29.355	225	
S33	30.990	2.740	Open Manhole	2100	9.004	28.250	225	9.003	28.975	225	725

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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)
								11.001	29.145	300	970
S1	30.945	3.610	Open Manhole	2100	1.006	27.335	1000	1.005	28.110	300	75
								7.004	28.185	150	
								8.004	28.185	150	
								9.004	28.110	225	
S2	30.820	3.485	Open Manhole	2100	1.007	27.335	1000	1.006	27.335	1000	
S3	30.280	2.945	Open Manhole	2100	1.008	27.335	1000	1.007	27.335	1000	
S4	30.090	2.755	Open Manhole	2100	1.009	27.335	1000	1.008	27.335	1000	
SP	29.675	0.275	Open Manhole	600 x 600	12.000	29.400	150				
SP	30.240	0.975	Open Manhole	600 x 600	13.000	29.265	225				
S23	30.505	1.305	Open Manhole	1200	12.001	29.200	225	12.000	29.275	150	
								13.000	29.200	225	
PI IN	30.700	1.550	Open Manhole	1200	12.002	29.150	225	12.001	29.150	225	
PI OUT	30.700	1.600	Open Manhole	1200	12.003	29.100	225	12.002	29.100	225	
S24	30.600	1.550	Open Manhole	1200	12.004	29.050	225	12.003	29.050	225	
S25	30.655	1.775	Open Manhole	1500	12.005	28.880	300	12.004	28.955	225	
SP	30.015	0.900	Open Manhole	600 x 600	14.000	29.115	150				
S21	30.330	1.355	Open Manhole	1200	14.001	28.975	150	14.000	28.975	150	
S22	30.595	2.345	Open Manhole	2100	12.006	28.250	225	12.005	28.640	300	465
								14.001	28.870	150	545
SP	28.875	0.450	Open Manhole	600 x 600	15.000	28.425	150				
SP	29.440	0.975	Open Manhole	600 x 600	16.000	28.465	225				
S17	29.830	1.665	Open Manhole	1500	15.001	28.165	300	15.000	28.315	150	
								16.000	28.240	225	
PI IN	29.830	1.680	Open Manhole	1500	15.002	28.150	300	15.001	28.150	300	
PI OUT	29.830	1.730	Open Manhole	1500	15.003	28.100	300	15.002	28.100	300	
SP	29.490	0.975	Open Manhole	600 x 600	17.000	28.515	225				
S16	29.770	1.345	Open Manhole	1200	17.001	28.425	225	17.000	28.425	225	
S11	29.945	1.225	Open Manhole	1200	18.000	28.720	225				
SP	29.725	0.900	Open Manhole	600 x 600	19.000	28.825	150				
S12	29.945	1.505	Open Manhole	1500	18.001	28.440	375	18.000	28.590	225	
								19.000	28.665	150	
S13	29.865	1.590	Open Manhole	1500	18.002	28.275	375	18.001	28.275	375	
S14	30.080	1.925	Open Manhole	1500	18.003	28.155	375	18.002	28.155	375	
S15	29.675	2.225	Open Manhole	2100	15.004	27.450	225	15.003	28.085	300	710
								17.001	28.375	225	925
								18.003	28.085	375	785
S5	29.940	2.605	Open Manhole	2100	1.010	27.335	1000	1.009	27.335	1000	

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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)
								12.006	28.110	225	
								15.004	27.335	225	
S6	29.045	1.710	Open Manhole	2100	1.011	27.335	600	1.010	27.335	1000	
S7	28.645	1.365	Open Manhole	1800	1.012	27.280	450	1.011	27.280	600	
PI IN	28.800	1.535	Open Manhole	1800	1.013	27.265	450	1.012	27.265	450	
PI OUT	28.800	1.635	Open Manhole	1800	1.014	27.165	450	1.013	27.165	450	
EX. SWMH	28.220	1.070	Open Manhole	1500		OUTFALL		1.014	27.150	450	

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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)
1.000	o	225	SP	29.925	29.475	0.225	Open Manhole	600 x 600
2.000	o	300	SP	30.490	29.440	0.750	Open Manhole	600 x 600
1.001	o	375	S46	31.075	29.235	1.465	Open Manhole	1500
1.002	o	375	PI IN	31.075	29.215	1.485	Open Manhole	1500
1.003	o	375	PI OUT	31.075	29.165	1.535	Open Manhole	1500
3.000	o	225	SP	30.860	29.885	0.750	Open Manhole	600 x 600
4.000	o	150	SP	31.005	30.105	0.750	Open Manhole	600 x 600
3.001	o	225	S44	31.120	29.785	1.110	Open Manhole	1200
3.002	o	225	PI IN	31.125	29.735	1.165	Open Manhole	1200
3.003	o	225	PI OUT	31.125	29.635	1.265	Open Manhole	1200
1.004	o	450	S45	31.145	28.975	1.720	Open Manhole	1500
5.000	o	225	S43	31.185	29.960	1.000	Open Manhole	1200
6.000	o	225	S41	30.960	29.735	1.000	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)
1.000	10.400	115.6	S46	31.075	29.385	1.465	Open Manhole	1500
2.000	18.345	141.1	S46	31.075	29.310	1.465	Open Manhole	1500
1.001	5.000	250.0	PI IN	31.075	29.215	1.485	Open Manhole	1500
1.002	6.200	124.0	PI OUT	31.075	29.165	1.535	Open Manhole	1500
1.003	28.840	250.8	S45	31.145	29.050	1.720	Open Manhole	1500
3.000	15.270	152.7	S44	31.120	29.785	1.110	Open Manhole	1200
4.000	10.600	43.3	S44	31.120	29.860	1.110	Open Manhole	1200
3.001	5.000	100.0	PI IN	31.125	29.735	1.165	Open Manhole	1200
3.002	1.700	17.0	PI OUT	31.125	29.635	1.265	Open Manhole	1200
3.003	16.275	37.4	S45	31.145	29.200	1.720	Open Manhole	1500
1.004	7.370	368.5	S42	30.980	28.955	1.575	Open Manhole	2100
5.000	8.905	24.7	S42	30.980	29.600	1.155	Open Manhole	2100
6.000	8.845	65.5	S42	30.980	29.600	1.155	Open Manhole	2100

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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)
1.005	o	300	S42	30.980	28.500	2.180	Open Manhole	2100
7.000	o	150	S101	30.425	29.525	0.750	Open Manhole	600
7.001	o	150	S102	30.410	29.235	1.025	Open Manhole	600
7.002	o	150	S103	30.325	28.805	1.370	Open Manhole	600
7.003	o	150	S104	30.350	28.630	1.570	Open Manhole	600
7.004	o	150	S105	30.400	28.430	1.820	Open Manhole	600
8.000	o	150	S106	30.250	29.350	0.750	Open Manhole	600
8.001	o	150	S107	30.375	29.210	1.015	Open Manhole	600
8.002	o	150	S108	30.375	29.020	1.205	Open Manhole	600
8.003	o	150	S109	30.475	28.725	1.600	Open Manhole	600
8.004	o	150	S110	30.485	28.560	1.775	Open Manhole	600
9.000	o	150	SP	29.675	29.400	0.125	Open Manhole	600 x 600
10.000	o	225	SP	30.240	29.265	0.750	Open Manhole	600 x 600
9.001	o	225	S34	30.630	29.200	1.205	Open Manhole	1200
9.002	o	225	PI IN	30.850	29.070	1.555	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)
1.005	24.790	63.6	S1	30.945	28.110	2.535	Open Manhole	2100
7.000	28.925	99.7	S102	30.410	29.235	1.025	Open Manhole	600
7.001	43.030	100.1	S103	30.325	28.805	1.370	Open Manhole	600
7.002	17.615	100.7	S104	30.350	28.630	1.570	Open Manhole	600
7.003	19.940	99.7	S105	30.400	28.430	1.820	Open Manhole	600
7.004	15.795	64.5	S1	30.945	28.185	2.610	Open Manhole	2100
8.000	13.810	98.6	S107	30.375	29.210	1.015	Open Manhole	600
8.001	19.215	101.1	S108	30.375	29.020	1.205	Open Manhole	600
8.002	29.465	99.9	S109	30.475	28.725	1.600	Open Manhole	600
8.003	16.420	99.5	S110	30.485	28.560	1.775	Open Manhole	600
8.004	18.340	48.9	S1	30.945	28.185	2.610	Open Manhole	2100
9.000	9.875	79.0	S34	30.630	29.275	1.205	Open Manhole	1200
10.000	9.820	151.1	S34	30.630	29.200	1.205	Open Manhole	1200
9.001	16.470	126.7	PI IN	30.850	29.070	1.555	Open Manhole	1200
9.002	4.640	92.8	PI OUT	30.850	29.020	1.605	Open Manhole	1200

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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)
9.003	o	225	PI OUT	30.850	29.020	1.605	Open Manhole	1200
11.000	o	225	S31	30.850	29.625	1.000	Open Manhole	1200
11.001	o	300	S32	30.850	29.280	1.270	Open Manhole	1500
9.004	o	225	S33	30.990	28.250	2.515	Open Manhole	2100
1.006	o	1000	S1	30.945	27.335	2.610	Open Manhole	2100
1.007	o	1000	S2	30.820	27.335	2.485	Open Manhole	2100
1.008	o	1000	S3	30.280	27.335	1.945	Open Manhole	2100
1.009	o	1000	S4	30.090	27.335	1.755	Open Manhole	2100
12.000	o	150	SP	29.675	29.400	0.125	Open Manhole	600 x 600
13.000	o	225	SP	30.240	29.265	0.750	Open Manhole	600 x 600
12.001	o	225	S23	30.505	29.200	1.080	Open Manhole	1200
12.002	o	225	PI IN	30.700	29.150	1.325	Open Manhole	1200
12.003	o	225	PI OUT	30.700	29.100	1.375	Open Manhole	1200
12.004	o	225	S24	30.600	29.050	1.325	Open Manhole	1200
12.005	o	300	S25	30.655	28.880	1.475	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)
9.003	5.735	127.4	S33	30.990	28.975	1.790	Open Manhole	2100
11.000	40.400	149.6	S32	30.850	29.355	1.270	Open Manhole	1500
11.001	16.960	125.6	S33	30.990	29.145	1.545	Open Manhole	2100
9.004	21.055	150.4	S1	30.945	28.110	2.610	Open Manhole	2100
1.006	60.000	0.0	S2	30.820	27.335	2.485	Open Manhole	2100
1.007	61.925	0.0	S3	30.280	27.335	1.945	Open Manhole	2100
1.008	80.780	0.0	S4	30.090	27.335	1.755	Open Manhole	2100
1.009	25.540	0.0	S5	29.940	27.335	1.605	Open Manhole	2100
12.000	12.495	100.0	S23	30.505	29.275	1.080	Open Manhole	1200
13.000	8.740	134.5	S23	30.505	29.200	1.080	Open Manhole	1200
12.001	5.955	119.1	PI IN	30.700	29.150	1.325	Open Manhole	1200
12.002	4.640	92.8	PI OUT	30.700	29.100	1.375	Open Manhole	1200
12.003	6.365	127.3	S24	30.600	29.050	1.325	Open Manhole	1200
12.004	11.645	122.6	S25	30.655	28.955	1.475	Open Manhole	1500
12.005	47.635	198.5	S22	30.595	28.640	1.655	Open Manhole	2100

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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)
14.000	o	150	SP	30.015	29.115	0.750	Open Manhole	600 x 600
14.001	o	150	S21	30.330	28.975	1.205	Open Manhole	1200
12.006	o	225	S22	30.595	28.250	2.120	Open Manhole	2100
15.000	o	150	SP	28.875	28.425	0.300	Open Manhole	600 x 600
16.000	o	225	SP	29.440	28.465	0.750	Open Manhole	600 x 600
15.001	o	300	S17	29.830	28.165	1.365	Open Manhole	1500
15.002	o	300	PI IN	29.830	28.150	1.380	Open Manhole	1500
15.003	o	300	PI OUT	29.830	28.100	1.430	Open Manhole	1500
17.000	o	225	SP	29.490	28.515	0.750	Open Manhole	600 x 600
17.001	o	225	S16	29.770	28.425	1.120	Open Manhole	1200
18.000	o	225	S11	29.945	28.720	1.000	Open Manhole	1200
19.000	o	150	SP	29.725	28.825	0.750	Open Manhole	600 x 600

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)
14.000	11.050	78.9	S21	30.330	28.975	1.205	Open Manhole	1200
14.001	8.275	78.8	S22	30.595	28.870	1.575	Open Manhole	2100
12.006	20.850	148.9	S5	29.940	28.110	1.605	Open Manhole	2100
15.000	10.840	98.5	S17	29.830	28.315	1.365	Open Manhole	1500
16.000	10.720	47.6	S17	29.830	28.240	1.365	Open Manhole	1500
15.001	2.855	190.3	PI IN	29.830	28.150	1.380	Open Manhole	1500
15.002	6.850	137.0	PI OUT	29.830	28.100	1.430	Open Manhole	1500
15.003	2.715	181.0	S15	29.675	28.085	1.290	Open Manhole	2100
17.000	9.065	100.7	S16	29.770	28.425	1.120	Open Manhole	1200
17.001	4.225	84.5	S15	29.675	28.375	1.075	Open Manhole	2100
18.000	19.400	149.2	S12	29.945	28.590	1.130	Open Manhole	1500
19.000	9.145	57.2	S12	29.945	28.665	1.130	Open Manhole	1500

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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)
18.001	o	375	S12	29.945	28.440	1.130	Open Manhole	1500
18.002	o	375	S13	29.865	28.275	1.215	Open Manhole	1500
18.003	o	375	S14	30.080	28.155	1.550	Open Manhole	1500
15.004	o	225	S15	29.675	27.450	2.000	Open Manhole	2100
1.010	o	1000	S5	29.940	27.335	1.605	Open Manhole	2100
1.011	o	600	S6	29.045	27.335	1.110	Open Manhole	2100
1.012	o	450	S7	28.645	27.280	0.915	Open Manhole	1800
1.013	o	450	PI IN	28.800	27.265	1.085	Open Manhole	1800
1.014	o	450	PI OUT	28.800	27.165	1.185	Open Manhole	1800

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)
18.001	36.340	220.2	S13	29.865	28.275	1.215	Open Manhole	1500
18.002	26.335	219.5	S14	30.080	28.155	1.550	Open Manhole	1500
18.003	6.800	97.1	S15	29.675	28.085	1.215	Open Manhole	2100
15.004	15.480	134.6	S5	29.940	27.335	2.380	Open Manhole	2100
1.010	55.650	0.0	S6	29.045	27.335	0.710	Open Manhole	2100
1.011	28.380	516.0	S7	28.645	27.280	0.765	Open Manhole	1800
1.012	7.045	469.7	PI IN	28.800	27.265	1.085	Open Manhole	1800
1.013	5.250	52.5	PI OUT	28.800	27.165	1.185	Open Manhole	1800
1.014	7.105	473.7	EX. SWMH	28.220	27.150	0.620	Open Manhole	1500

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)
1.014	EX. SWMH	28.220	27.150	27.150	1500	0

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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	3.000
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	4
Number of Online Controls	5	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)	5	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.700	Storm Duration (mins)	30
Ratio R	0.438		

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Online Controls for Storm

Complex Manhole: S42, DS/PN: 1.005, Volume (m³): 10.1

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0175-1450-0800-1450
Design Head (m)	0.800
Design Flow (l/s)	14.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	175
Invert Level (m)	28.500
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	14.5
Flush-Flo™	0.289	14.5
Kick-Flo®	0.590	12.6
Mean Flow over Head Range	-	12.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.2	1.200	17.6	3.000	27.2	7.000	41.0
0.200	14.1	1.400	18.9	3.500	29.3	7.500	42.4
0.300	14.5	1.600	20.1	4.000	31.3	8.000	43.7
0.400	14.2	1.800	21.3	4.500	33.1	8.500	44.8
0.500	13.7	2.000	22.4	5.000	34.8	9.000	46.2
0.600	12.7	2.200	23.5	5.500	36.5	9.500	47.4
0.800	14.5	2.400	24.5	6.000	38.0		
1.000	16.1	2.600	25.4	6.500	39.5		

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0262-3700-0750-3700
Design Head (m)	0.750
Design Flow (l/s)	37.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	262
Invert Level (m)	29.300

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Hydro-Brake® Optimum

Minimum Outlet Pipe Diameter (mm) 300
Suggested Manhole Diameter (mm) 1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.750	37.0
Flush-Flo™	0.379	37.0
Kick-Flo®	0.616	33.7
Mean Flow over Head Range	-	28.8

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	8.4	1.200	46.4	3.000	72.3	7.000	109.2
0.200	26.9	1.400	50.0	3.500	77.9	7.500	113.0
0.300	36.5	1.600	53.3	4.000	83.1	8.000	115.7
0.400	37.0	1.800	56.4	4.500	88.0	8.500	119.3
0.500	36.2	2.000	59.4	5.000	92.7	9.000	122.9
0.600	34.2	2.200	62.2	5.500	97.1	9.500	126.3
0.800	38.2	2.400	64.8	6.000	101.3		
1.000	42.5	2.600	67.4	6.500	105.3		

Complex Manhole: S33, DS/PN: 9.004, Volume (m³): 10.7

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0113-5500-0800-5500
Design Head (m)	0.800
Design Flow (l/s)	5.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	113
Invert Level (m)	28.250
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	5.5
Flush-Flo™	0.243	5.5
Kick-Flo®	0.540	4.6
Mean Flow over Head Range	-	4.7

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

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Hydro-Brake® Optimum

invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.0	1.200	6.6	3.000	10.2	7.000	15.3
0.200	5.5	1.400	7.1	3.500	11.0	7.500	15.8
0.300	5.4	1.600	7.6	4.000	11.7	8.000	16.3
0.400	5.3	1.800	8.0	4.500	12.4	8.500	16.8
0.500	4.9	2.000	8.4	5.000	13.0	9.000	17.3
0.600	4.8	2.200	8.8	5.500	13.6	9.500	17.7
0.800	5.5	2.400	9.2	6.000	14.2		
1.000	6.1	2.600	9.6	6.500	14.8		

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0170-1350-0750-1350
Design Head (m)	0.750
Design Flow (l/s)	13.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	170
Invert Level (m)	29.050
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.750	13.5
Flush-Flo™	0.276	13.5
Kick-Flo®	0.556	11.7
Mean Flow over Head Range	-	11.2

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	6.0	1.200	16.9	3.000	26.1	7.000	39.3
0.200	13.2	1.400	18.1	3.500	28.1	7.500	40.7
0.300	13.4	1.600	19.3	4.000	30.0	8.000	41.8
0.400	13.2	1.800	20.5	4.500	31.8	8.500	43.1
0.500	12.5	2.000	21.5	5.000	33.4	9.000	44.3
0.600	12.2	2.200	22.5	5.500	35.0	9.500	45.6
0.800	13.9	2.400	23.5	6.000	36.5		
1.000	15.5	2.600	24.4	6.500	37.9		

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Complex Manhole: S22, DS/PN: 12.006, Volume (m³): 11.5

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0103-4500-0800-4500
Design Head (m)	0.800
Design Flow (l/s)	4.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	103
Invert Level (m)	28.250
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	4.5
Flush-Flo™	0.240	4.5
Kick-Flo®	0.531	3.7
Mean Flow over Head Range	-	3.9

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.5	1.200	5.4	3.000	8.3	7.000	12.5
0.200	4.5	1.400	5.8	3.500	9.0	7.500	12.9
0.300	4.5	1.600	6.2	4.000	9.6	8.000	13.3
0.400	4.3	1.800	6.6	4.500	10.1	8.500	13.7
0.500	4.0	2.000	6.9	5.000	10.6	9.000	14.1
0.600	3.9	2.200	7.2	5.500	11.1	9.500	14.5
0.800	4.5	2.400	7.5	6.000	11.6		
1.000	5.0	2.600	7.8	6.500	12.0		

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0159-1150-0750-1150
Design Head (m)	0.750
Design Flow (l/s)	11.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	159
Invert Level (m)	29.050
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

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Hydro-Brake® Optimum

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.750	11.5
Flush-Flo™	0.263	11.5
Kick-Flo®	0.549	9.9
Mean Flow over Head Range	-	9.6

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	5.7	1.200	14.4	3.000	22.2	7.000	33.4
0.200	11.3	1.400	15.4	3.500	23.9	7.500	34.6
0.300	11.5	1.600	16.5	4.000	25.5	8.000	35.5
0.400	11.2	1.800	17.4	4.500	27.0	8.500	36.6
0.500	10.6	2.000	18.3	5.000	28.4	9.000	37.7
0.600	10.4	2.200	19.2	5.500	29.8	9.500	38.7
0.800	11.9	2.400	20.0	6.000	31.0		
1.000	13.2	2.600	20.8	6.500	32.3		

Complex Manhole: S15, DS/PN: 15.004, Volume (m³): 8.4

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0155-1100-0800-1100
Design Head (m)	0.800
Design Flow (l/s)	11.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	155
Invert Level (m)	27.450
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	11.0
Flush-Flo™	0.267	11.0
Kick-Flo®	0.575	9.4
Mean Flow over Head Range	-	9.3

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

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Hydro-Brake® Optimum

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.6	1.200	13.3	3.000	20.6	7.000	31.0
0.200	10.8	1.400	14.3	3.500	22.2	7.500	32.0
0.300	11.0	1.600	15.3	4.000	23.6	8.000	33.0
0.400	10.7	1.800	16.1	4.500	25.0	8.500	33.9
0.500	10.3	2.000	17.0	5.000	26.3	9.000	34.9
0.600	9.6	2.200	17.8	5.500	27.6	9.500	35.9
0.800	11.0	2.400	18.5	6.000	28.7		
1.000	12.2	2.600	19.2	6.500	29.9		

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0232-2800-0750-2800
Design Head (m)	0.750
Design Flow (l/s)	28.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	232
Invert Level (m)	28.250
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.750	28.0
Flush-Flo™	0.347	27.9
Kick-Flo®	0.596	25.1
Mean Flow over Head Range	-	22.2

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	7.7	1.200	35.1	3.000	54.5	7.000	82.4
0.200	23.4	1.400	37.8	3.500	58.8	7.500	85.2
0.300	27.8	1.600	40.3	4.000	62.7	8.000	87.3
0.400	27.8	1.800	42.6	4.500	66.4	8.500	90.1
0.500	27.0	2.000	44.8	5.000	69.9	9.000	92.7
0.600	25.2	2.200	46.9	5.500	73.2	9.500	95.3
0.800	28.9	2.400	49.0	6.000	76.4		
1.000	32.1	2.600	50.9	6.500	79.4		

Complex Manhole: S7, DS/PN: 1.012, Volume (m³): 10.9

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Hydro-Brake® Optimum

Unit Reference	MD-SHE-0277-4100-0550-4100
Design Head (m)	0.550
Design Flow (l/s)	41.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	277
Invert Level (m)	27.280
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.550	41.0
Flush-Flo™	0.366	40.9
Kick-Flo®	0.501	39.2
Mean Flow over Head Range	-	28.9

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.7	1.200	59.7	3.000	93.2	7.000	140.0
0.200	28.5	1.400	64.3	3.500	100.5	7.500	145.0
0.300	40.5	1.600	68.6	4.000	107.2	8.000	149.8
0.400	40.8	1.800	72.7	4.500	113.6	8.500	154.5
0.500	39.2	2.000	76.5	5.000	119.6	9.000	159.1
0.600	42.7	2.200	80.1	5.500	125.3	9.500	163.5
0.800	49.1	2.400	83.6	6.000	129.4		
1.000	54.7	2.600	86.9	6.500	134.8		

Orifice

Diameter (m) 0.287 Discharge Coefficient 0.600 Invert Level (m) 27.830

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Storage Structures for Storm

Cellular Storage Manhole: S42, DS/PN: 1.005

Invert Level (m) 28.500 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.68
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	563.2	563.2	1.300	563.2	686.6
0.100	563.2	572.7	1.400	563.2	696.1
0.200	563.2	582.2	1.500	563.2	705.6
0.300	563.2	591.7	1.550	563.2	710.3
0.400	563.2	601.2	1.551	0.0	710.4
0.500	563.2	610.7	1.800	0.0	710.4
0.600	563.2	620.2	1.900	0.0	710.4
0.700	563.2	629.6	2.000	0.0	710.4
0.800	563.2	639.1	2.100	0.0	710.4
0.900	563.2	648.6	2.200	0.0	710.4
1.000	563.2	658.1	2.300	0.0	710.4
1.100	563.2	667.6	2.400	0.0	710.4
1.200	563.2	677.1	2.500	0.0	710.4

Cellular Storage Manhole: S33, DS/PN: 9.004

Invert Level (m) 28.250 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.69
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	210.8	210.8	1.300	210.8	286.3
0.100	210.8	216.6	1.400	210.8	292.1
0.200	210.8	222.4	1.500	210.8	297.9
0.300	210.8	228.2	1.550	210.8	300.8
0.400	210.8	234.0	1.551	0.0	300.8
0.500	210.8	239.8	1.800	0.0	300.8
0.600	210.8	245.6	1.900	0.0	300.8
0.700	210.8	251.5	2.000	0.0	300.8
0.800	210.8	257.3	2.100	0.0	300.8
0.900	210.8	263.1	2.200	0.0	300.8
1.000	210.8	268.9	2.300	0.0	300.8
1.100	210.8	274.7	2.400	0.0	300.8
1.200	210.8	280.5	2.500	0.0	300.8

Cellular Storage Manhole: S22, DS/PN: 12.006

Invert Level (m) 28.250 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.68
Infiltration Coefficient Side (m/hr) 0.00000

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Cellular Storage Manhole: S22, DS/PN: 12.006

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	166.4	166.4	1.300	166.4	233.5
0.100	166.4	171.6	1.400	166.4	238.6
0.200	166.4	176.7	1.500	166.4	243.8
0.300	166.4	181.9	1.550	166.4	246.4
0.400	166.4	187.0	1.551	0.0	246.4
0.500	166.4	192.2	1.800	0.0	246.4
0.600	166.4	197.4	1.900	0.0	246.4
0.700	166.4	202.5	2.000	0.0	246.4
0.800	166.4	207.7	2.100	0.0	246.4
0.900	166.4	212.8	2.200	0.0	246.4
1.000	166.4	218.0	2.300	0.0	246.4
1.100	166.4	223.2	2.400	0.0	246.4
1.200	166.4	228.3	2.500	0.0	246.4

Cellular Storage Manhole: S15, DS/PN: 15.004

Invert Level (m) 27.450 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.69
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	393.6	393.6	1.300	393.6	496.8
0.100	393.6	401.5	1.400	393.6	504.7
0.200	393.6	409.5	1.500	393.6	512.6
0.300	393.6	417.4	1.550	393.6	516.6
0.400	393.6	425.3	1.551	0.0	516.6
0.500	393.6	433.3	1.800	0.0	516.6
0.600	393.6	441.2	1.900	0.0	516.6
0.700	393.6	449.2	2.000	0.0	516.6
0.800	393.6	457.1	2.100	0.0	516.6
0.900	393.6	465.0	2.200	0.0	516.6
1.000	393.6	473.0	2.300	0.0	516.6
1.100	393.6	480.9	2.400	0.0	516.6
1.200	393.6	488.8	2.500	0.0	516.6

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	3.000
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	4
Number of Online Controls	5	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	0.438
Region	England and Wales	Cv (Summer)	0.925
M5-60 (mm)	20.700	Cv (Winter)	0.925

Margin for Flood Risk Warning (mm)	75.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 2, 30, 100
Climate Change (%)	0, 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	SP	15 Summer	1	+0%	30/15 Summer	30/15 Summer		
2.000	SP	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
1.001	S46	15 Summer	1	+0%	2/15 Summer			
1.002	PI IN	15 Summer	1	+0%	30/15 Summer			
1.003	PI OUT	15 Summer	1	+0%	30/15 Summer			
3.000	SP	15 Summer	1	+0%	30/15 Summer			
4.000	SP	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
3.001	S44	15 Summer	1	+0%	2/15 Summer			
3.002	PI IN	15 Summer	1	+0%	30/15 Summer			
3.003	PI OUT	15 Summer	1	+0%	100/15 Summer			
1.004	S45	15 Summer	1	+0%	30/15 Summer			
5.000	S43	15 Summer	1	+0%	100/15 Summer			
6.000	S41	15 Summer	1	+0%	30/15 Summer			
1.005	S42	180 Summer	1	+0%	1/30 Summer			
7.000	S101	15 Summer	1	+0%				
7.001	S102	15 Summer	1	+0%	100/15 Summer			
7.002	S103	15 Summer	1	+0%	30/15 Summer			

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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)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SP	29.562	-0.138	0.000	0.32		13.0	OK	8
2.000	SP	29.634	-0.106	0.000	0.74		59.7	OK	3
1.001	S46	29.524	-0.086	0.000	0.94		72.4	OK	
1.002	PI IN	29.442	-0.148	0.000	0.68		72.6	OK	
1.003	PI OUT	29.424	-0.116	0.000	0.64		70.9	OK	
3.000	SP	30.000	-0.110	0.000	0.47		17.2	OK	
4.000	SP	30.186	-0.069	0.000	0.56		13.7	OK	3
3.001	S44	29.963	-0.047	0.000	0.97		30.6	OK	
3.002	PI IN	29.873	-0.087	0.000	0.69		30.8	OK	
3.003	PI OUT	29.735	-0.125	0.000	0.41		30.9	OK	
1.004	S45	29.378	-0.047	0.000	1.00		96.8	OK	
5.000	S43	30.052	-0.133	0.000	0.35		29.5	OK	
6.000	S41	29.856	-0.104	0.000	0.56		29.0	OK	
1.005	S42	28.916	0.116	0.000	0.11		14.3	SURCHARGED	
7.000	S101	29.552	-0.123	0.000	0.07		1.2	OK	
7.001	S102	29.292	-0.093	0.000	0.30		5.2	OK	
7.002	S103	28.867	-0.088	0.000	0.36		5.9	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.003	S104	15 Summer	1	+0%	30/15 Summer			
7.004	S105	15 Summer	1	+0%	30/15 Summer			
8.000	S106	15 Summer	1	+0%				
8.001	S107	15 Summer	1	+0%				
8.002	S108	15 Summer	1	+0%				
8.003	S109	15 Summer	1	+0%				
8.004	S110	15 Summer	1	+0%				
9.000	SP	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
10.000	SP	15 Summer	1	+0%	30/15 Summer			
9.001	S34	15 Summer	1	+0%	30/15 Summer			
9.002	PI IN	15 Summer	1	+0%	2/15 Summer			
9.003	PI OUT	15 Summer	1	+0%	30/15 Summer			
11.000	S31	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
11.001	S32	15 Summer	1	+0%	30/15 Summer			
9.004	S33	180 Summer	1	+0%	1/15 Summer			
1.006	S1	360 Summer	1	+0%	30/120 Summer			
1.007	S2	360 Summer	1	+0%	30/120 Summer			
1.008	S3	360 Summer	1	+0%	100/60 Summer			
1.009	S4	360 Summer	1	+0%	100/60 Summer			
12.000	SP	15 Summer	1	+0%	30/15 Summer	30/15 Summer		
13.000	SP	15 Summer	1	+0%	2/15 Summer			
12.001	S23	15 Summer	1	+0%	2/15 Summer			
12.002	PI IN	15 Summer	1	+0%	30/15 Summer			
12.003	PI OUT	15 Summer	1	+0%	30/15 Summer			
12.004	S24	15 Summer	1	+0%	30/15 Summer			
12.005	S25	15 Summer	1	+0%	30/15 Summer			
14.000	SP	15 Summer	1	+0%	30/15 Summer			
14.001	S21	15 Summer	1	+0%	30/15 Summer			
12.006	S22	120 Summer	1	+0%	1/15 Summer			
15.000	SP	15 Summer	1	+0%	30/15 Summer	30/15 Summer		
16.000	SP	15 Summer	1	+0%	30/15 Summer			
15.001	S17	15 Summer	1	+0%	2/15 Summer			
15.002	PI IN	15 Summer	1	+0%	30/15 Summer			
15.003	PI OUT	15 Summer	1	+0%	30/15 Summer			
17.000	SP	15 Summer	1	+0%	30/15 Summer			
17.001	S16	15 Summer	1	+0%	30/15 Summer			
18.000	S11	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
19.000	SP	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
18.001	S12	15 Summer	1	+0%	30/15 Summer			
18.002	S13	15 Summer	1	+0%	30/15 Summer			
18.003	S14	15 Summer	1	+0%	2/15 Summer			
15.004	S15	240 Summer	1	+0%	1/15 Summer			
1.010	S5	360 Summer	1	+0%	100/60 Summer			
1.011	S6	360 Summer	1	+0%	30/60 Summer			
1.012	S7	360 Summer	1	+0%	30/30 Summer			
1.013	PI IN	360 Summer	1	+0%				
1.014	PI OUT	360 Summer	1	+0%				

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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)	Pipe Flow (l/s)	Status	Level Exceeded
7.003	S104	28.691	-0.089	0.000	0.35		5.8	OK	
7.004	S105	28.498	-0.082	0.000	0.41		8.5	OK	
8.000	S106	29.382	-0.118	0.000	0.11		1.7	OK	
8.001	S107	29.242	-0.118	0.000	0.10		1.7	OK	
8.002	S108	29.071	-0.099	0.000	0.24		4.1	OK	
8.003	S109	28.776	-0.099	0.000	0.25		4.1	OK	
8.004	S110	28.613	-0.097	0.000	0.27		6.4	OK	
9.000	SP	29.452	-0.098	0.000	0.26		4.7	OK	3
10.000	SP	29.393	-0.097	0.000	0.62		21.6	OK	
9.001	S34	29.331	-0.094	0.000	0.64		26.3	OK	
9.002	PI IN	29.228	-0.067	0.000	0.83		26.3	OK	
9.003	PI OUT	29.184	-0.061	0.000	0.88		26.3	OK	
11.000	S31	29.763	-0.087	0.000	0.68		27.4	OK	1
11.001	S32	29.460	-0.120	0.000	0.66		55.8	OK	
9.004	S33	28.641	0.166	0.000	0.14		5.4	SURCHARGED	
1.006	S1	27.778	-0.557	0.000	0.04		25.2	OK	
1.007	S2	27.761	-0.574	0.000	0.03		23.3	OK	
1.008	S3	27.743	-0.592	0.000	0.03		23.6	OK	
1.009	S4	27.723	-0.612	0.000	0.06		22.9	OK	
12.000	SP	29.453	-0.097	0.000	0.27		4.4	OK	6
13.000	SP	29.398	-0.092	0.000	0.65		23.5	OK	
12.001	S23	29.365	-0.060	0.000	0.88		27.8	OK	
12.002	PI IN	29.315	-0.060	0.000	0.88		27.8	OK	
12.003	PI OUT	29.265	-0.060	0.000	0.89		27.9	OK	
12.004	S24	29.189	-0.086	0.000	0.70		27.9	OK	
12.005	S25	29.041	-0.139	0.000	0.55		40.9	OK	
14.000	SP	29.199	-0.066	0.000	0.60		10.8	OK	
14.001	S21	29.061	-0.064	0.000	0.62		10.8	OK	
12.006	S22	28.657	0.182	0.000	0.11		4.4	SURCHARGED	
15.000	SP	28.511	-0.064	0.000	0.62		10.0	OK	22
16.000	SP	28.583	-0.107	0.000	0.54		34.4	OK	
15.001	S17	28.380	-0.085	0.000	0.86		44.2	OK	
15.002	PI IN	28.340	-0.110	0.000	0.72		44.2	OK	
15.003	PI OUT	28.314	-0.086	0.000	0.85		44.4	OK	
17.000	SP	28.607	-0.133	0.000	0.35		14.9	OK	
17.001	S16	28.534	-0.116	0.000	0.47		14.9	OK	
18.000	S11	28.852	-0.093	0.000	0.65		24.8	OK	3
19.000	SP	28.898	-0.077	0.000	0.48		9.9	OK	4
18.001	S12	28.672	-0.143	0.000	0.68		83.0	OK	
18.002	S13	28.514	-0.136	0.000	0.69		81.2	OK	
18.003	S14	28.444	-0.086	0.000	0.95		101.6	OK	
15.004	S15	27.926	0.251	0.000	0.28		10.9	SURCHARGED	
1.010	S5	27.717	-0.618	0.000	0.06		39.0	OK	
1.011	S6	27.697	-0.238	0.000	0.16		39.7	OK	
1.012	S7	27.668	-0.062	0.000	0.40		39.6	OK	
1.013	PI IN	27.408	-0.307	0.000	0.22		39.6	OK	
1.014	PI OUT	27.362	-0.253	0.000	0.40		39.6	OK	

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2 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	3.000
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	4
Number of Online Controls	5	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	0.438
Region	England and Wales	Cv (Summer)	0.925
M5-60 (mm)	20.700	Cv (Winter)	0.925

Margin for Flood Risk Warning (mm)	75.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 2, 30, 100
Climate Change (%)	0, 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	SP	15 Summer	2	+0%	30/15 Summer	30/15 Summer		
2.000	SP	15 Summer	2	+0%	30/15 Summer	100/15 Summer		
1.001	S46	15 Summer	2	+0%	2/15 Summer			
1.002	PI IN	15 Summer	2	+0%	30/15 Summer			
1.003	PI OUT	15 Summer	2	+0%	30/15 Summer			
3.000	SP	15 Summer	2	+0%	30/15 Summer			
4.000	SP	15 Summer	2	+0%	30/15 Summer	100/15 Summer		
3.001	S44	15 Summer	2	+0%	2/15 Summer			
3.002	PI IN	15 Summer	2	+0%	30/15 Summer			
3.003	PI OUT	15 Summer	2	+0%	100/15 Summer			
1.004	S45	30 Summer	2	+0%	30/15 Summer			
5.000	S43	15 Summer	2	+0%	100/15 Summer			
6.000	S41	15 Summer	2	+0%	30/15 Summer			
1.005	S42	180 Summer	2	+0%	1/30 Summer			
7.000	S101	15 Summer	2	+0%				
7.001	S102	15 Summer	2	+0%	100/15 Summer			
7.002	S103	15 Summer	2	+0%	30/15 Summer			

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2 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)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SP	29.638	-0.062	0.000	0.42		16.8	OK	8
2.000	SP	29.726	-0.014	0.000	0.92		74.1	OK	3
1.001	S46	29.611	0.001	0.000	1.18		90.7	SURCHARGED	
1.002	PI IN	29.581	-0.009	0.000	0.80		86.2	OK	
1.003	PI OUT	29.499	-0.041	0.000	0.79		86.9	OK	
3.000	SP	30.076	-0.034	0.000	0.60		22.2	OK	
4.000	SP	30.200	-0.055	0.000	0.73		17.6	OK	3
3.001	S44	30.035	0.025	0.000	1.27		39.9	SURCHARGED	
3.002	PI IN	29.903	-0.057	0.000	0.90		40.3	OK	
3.003	PI OUT	29.752	-0.108	0.000	0.53		40.3	OK	
1.004	S45	29.425	0.000	0.000	1.13		109.4	OK	
5.000	S43	30.066	-0.119	0.000	0.45		38.1	OK	
6.000	S41	29.878	-0.082	0.000	0.72		37.5	OK	
1.005	S42	29.038	0.238	0.000	0.11		14.3	SURCHARGED	
7.000	S101	29.556	-0.119	0.000	0.09		1.6	OK	
7.001	S102	29.301	-0.084	0.000	0.39		6.7	OK	
7.002	S103	28.877	-0.078	0.000	0.46		7.6	OK	

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2 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.
7.003	S104	15 Summer	2	+0%	30/15 Summer			
7.004	S105	15 Summer	2	+0%	30/15 Summer			
8.000	S106	15 Summer	2	+0%				
8.001	S107	15 Summer	2	+0%				
8.002	S108	15 Summer	2	+0%				
8.003	S109	15 Summer	2	+0%				
8.004	S110	15 Summer	2	+0%				
9.000	SP	15 Summer	2	+0%	30/15 Summer	100/15 Summer		
10.000	SP	15 Summer	2	+0%	30/15 Summer			
9.001	S34	15 Summer	2	+0%	30/15 Summer			
9.002	PI IN	15 Summer	2	+0%	2/15 Summer			
9.003	PI OUT	15 Summer	2	+0%	30/15 Summer			
11.000	S31	15 Summer	2	+0%	30/15 Summer	100/15 Summer		
11.001	S32	15 Summer	2	+0%	30/15 Summer			
9.004	S33	120 Winter	2	+0%	1/15 Summer			
1.006	S1	240 Summer	2	+0%	30/120 Summer			
1.007	S2	240 Summer	2	+0%	30/120 Summer			
1.008	S3	240 Summer	2	+0%	100/60 Summer			
1.009	S4	240 Summer	2	+0%	100/60 Summer			
12.000	SP	15 Summer	2	+0%	30/15 Summer	30/15 Summer		
13.000	SP	15 Summer	2	+0%	2/15 Summer			
12.001	S23	15 Summer	2	+0%	2/15 Summer			
12.002	PI IN	15 Summer	2	+0%	30/15 Summer			
12.003	PI OUT	15 Summer	2	+0%	30/15 Summer			
12.004	S24	15 Summer	2	+0%	30/15 Summer			
12.005	S25	15 Summer	2	+0%	30/15 Summer			
14.000	SP	15 Summer	2	+0%	30/15 Summer			
14.001	S21	15 Summer	2	+0%	30/15 Summer			
12.006	S22	120 Winter	2	+0%	1/15 Summer			
15.000	SP	15 Summer	2	+0%	30/15 Summer	30/15 Summer		
16.000	SP	15 Summer	2	+0%	30/15 Summer			
15.001	S17	15 Summer	2	+0%	2/15 Summer			
15.002	PI IN	15 Summer	2	+0%	30/15 Summer			
15.003	PI OUT	15 Summer	2	+0%	30/15 Summer			
17.000	SP	15 Summer	2	+0%	30/15 Summer			
17.001	S16	15 Summer	2	+0%	30/15 Summer			
18.000	S11	15 Summer	2	+0%	30/15 Summer	100/15 Summer		
19.000	SP	15 Summer	2	+0%	30/15 Summer	100/15 Summer		
18.001	S12	15 Summer	2	+0%	30/15 Summer			
18.002	S13	15 Summer	2	+0%	30/15 Summer			
18.003	S14	15 Summer	2	+0%	2/15 Summer			
15.004	S15	240 Summer	2	+0%	1/15 Summer			
1.010	S5	240 Summer	2	+0%	100/60 Summer			
1.011	S6	240 Summer	2	+0%	30/60 Summer			
1.012	S7	240 Summer	2	+0%	30/30 Summer			
1.013	PI IN	240 Summer	2	+0%				
1.014	PI OUT	240 Summer	2	+0%				

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2 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)	Pipe Flow (l/s)	Status	Level Exceeded
7.003	S104	28.701	-0.079	0.000	0.45		7.6	OK	
7.004	S105	28.509	-0.071	0.000	0.53		11.0	OK	
8.000	S106	29.387	-0.113	0.000	0.14		2.2	OK	
8.001	S107	29.246	-0.114	0.000	0.13		2.2	OK	
8.002	S108	29.078	-0.092	0.000	0.31		5.4	OK	
8.003	S109	28.783	-0.092	0.000	0.32		5.3	OK	
8.004	S110	28.621	-0.089	0.000	0.34		8.2	OK	
9.000	SP	29.460	-0.090	0.000	0.34		6.1	OK	3
10.000	SP	29.429	-0.061	0.000	0.80		27.9	OK	
9.001	S34	29.393	-0.032	0.000	0.79		32.5	OK	
9.002	PI IN	29.320	0.025	0.000	0.97		30.7	SURCHARGED	
9.003	PI OUT	29.245	0.000	0.000	1.02		30.5	OK	
11.000	S31	29.791	-0.059	0.000	0.88		35.3	OK	1
11.001	S32	29.494	-0.086	0.000	0.85		71.9	OK	
9.004	S33	28.761	0.286	0.000	0.14		5.4	SURCHARGED	
1.006	S1	27.823	-0.512	0.000	0.04		29.9	OK	
1.007	S2	27.805	-0.530	0.000	0.04		26.8	OK	
1.008	S3	27.786	-0.549	0.000	0.04		26.9	OK	
1.009	S4	27.764	-0.571	0.000	0.06		23.1	OK	
12.000	SP	29.465	-0.085	0.000	0.35		5.6	OK	6
13.000	SP	29.533	0.043	0.000	0.77		27.6	SURCHARGED	
12.001	S23	29.445	0.020	0.000	1.00		31.4	SURCHARGED	
12.002	PI IN	29.331	-0.044	0.000	0.99		31.3	OK	
12.003	PI OUT	29.281	-0.044	0.000	1.00		31.5	OK	
12.004	S24	29.202	-0.073	0.000	0.79		31.5	OK	
12.005	S25	29.062	-0.118	0.000	0.67		49.9	OK	
14.000	SP	29.215	-0.050	0.000	0.78		14.0	OK	
14.001	S21	29.077	-0.048	0.000	0.80		14.0	OK	
12.006	S22	28.782	0.307	0.000	0.11		4.4	SURCHARGED	
15.000	SP	28.568	-0.007	0.000	0.77		12.4	OK	22
16.000	SP	28.610	-0.080	0.000	0.69		43.7	OK	
15.001	S17	28.506	0.041	0.000	1.04		53.6	SURCHARGED	
15.002	PI IN	28.403	-0.047	0.000	0.86		52.9	OK	
15.003	PI OUT	28.361	-0.039	0.000	1.00		51.9	OK	
17.000	SP	28.621	-0.119	0.000	0.46		19.3	OK	
17.001	S16	28.552	-0.098	0.000	0.61		19.3	OK	
18.000	S11	28.878	-0.067	0.000	0.84		32.1	OK	3
19.000	SP	28.910	-0.065	0.000	0.61		12.8	OK	4
18.001	S12	28.732	-0.083	0.000	0.87		105.9	OK	
18.002	S13	28.627	-0.023	0.000	0.84		98.3	OK	
18.003	S14	28.544	0.014	0.000	1.15		123.4	SURCHARGED	
15.004	S15	28.053	0.378	0.000	0.28		11.0	SURCHARGED	
1.010	S5	27.758	-0.577	0.000	0.06		40.4	OK	
1.011	S6	27.737	-0.198	0.000	0.17		40.6	OK	
1.012	S7	27.703	-0.027	0.000	0.40		40.3	OK	
1.013	PI IN	27.409	-0.306	0.000	0.23		40.3	OK	
1.014	PI OUT	27.364	-0.251	0.000	0.41		40.3	OK	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	3.000
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	4
Number of Online Controls	5	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	0.438
Region	England and Wales	Cv (Summer)	0.925
M5-60 (mm)	20.700	Cv (Winter)	0.925

Margin for Flood Risk Warning (mm)	75.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 2, 30, 100
Climate Change (%)	0, 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	SP	15 Summer	30	+0%	30/15 Summer	30/15 Summer		
2.000	SP	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
1.001	S46	15 Summer	30	+0%	2/15 Summer			
1.002	PI IN	15 Summer	30	+0%	30/15 Summer			
1.003	PI OUT	15 Summer	30	+0%	30/15 Summer			
3.000	SP	15 Summer	30	+0%	30/15 Summer			
4.000	SP	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
3.001	S44	15 Summer	30	+0%	2/15 Summer			
3.002	PI IN	15 Summer	30	+0%	30/15 Summer			
3.003	PI OUT	15 Summer	30	+0%	100/15 Summer			
1.004	S45	15 Summer	30	+0%	30/15 Summer			
5.000	S43	15 Summer	30	+0%	100/15 Summer			
6.000	S41	15 Summer	30	+0%	30/15 Summer			
1.005	S42	180 Winter	30	+0%	1/30 Summer			
7.000	S101	15 Summer	30	+0%				
7.001	S102	15 Summer	30	+0%	100/15 Summer			
7.002	S103	15 Summer	30	+0%	30/15 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SP	29.928	0.228	3.431	1.01		40.8	FLOOD	8
2.000	SP	30.287	0.547	0.000	1.62		130.4	SURCHARGED	3
1.001	S46	29.925	0.315	0.000	1.77		135.9	SURCHARGED	
1.002	PI IN	29.805	0.215	0.000	1.27		135.8	SURCHARGED	
1.003	PI OUT	29.684	0.144	0.000	1.22		135.4	SURCHARGED	
3.000	SP	30.420	0.310	0.000	1.04		38.5	SURCHARGED	
4.000	SP	30.671	0.416	0.000	1.20		29.0	SURCHARGED	3
3.001	S44	30.312	0.302	0.000	2.11		66.5	SURCHARGED	
3.002	PI IN	30.082	0.122	0.000	1.50		66.8	SURCHARGED	
3.003	PI OUT	29.852	-0.008	0.000	0.88		66.9	OK	
1.004	S45	29.512	0.087	0.000	2.09		201.9	SURCHARGED	
5.000	S43	30.121	-0.064	0.000	0.86		72.4	OK	
6.000	S41	30.070	0.110	0.000	1.36		70.6	SURCHARGED	
1.005	S42	29.485	0.685	0.000	0.32		39.9	SURCHARGED	
7.000	S101	29.568	-0.107	0.000	0.18		3.1	OK	
7.001	S102	29.352	-0.033	0.000	0.90		15.6	OK	
7.002	S103	29.001	0.046	0.000	0.99		16.4	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.003	S104	15 Summer	30	+0%	30/15 Summer			
7.004	S105	15 Summer	30	+0%	30/15 Summer			
8.000	S106	15 Summer	30	+0%				
8.001	S107	15 Summer	30	+0%				
8.002	S108	15 Summer	30	+0%				
8.003	S109	15 Summer	30	+0%				
8.004	S110	15 Summer	30	+0%				
9.000	SP	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
10.000	SP	15 Summer	30	+0%	30/15 Summer			
9.001	S34	15 Summer	30	+0%	30/15 Summer			
9.002	PI IN	15 Summer	30	+0%	2/15 Summer			
9.003	PI OUT	15 Summer	30	+0%	30/15 Summer			
11.000	S31	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
11.001	S32	15 Summer	30	+0%	30/15 Summer			
9.004	S33	120 Winter	30	+0%	1/15 Summer			
1.006	S1	180 Winter	30	+0%	30/120 Summer			
1.007	S2	180 Winter	30	+0%	30/120 Summer			
1.008	S3	180 Winter	30	+0%	100/60 Summer			
1.009	S4	180 Winter	30	+0%	100/60 Summer			
12.000	SP	15 Summer	30	+0%	30/15 Summer	30/15 Summer		
13.000	SP	15 Summer	30	+0%	2/15 Summer			
12.001	S23	15 Summer	30	+0%	2/15 Summer			
12.002	PI IN	15 Summer	30	+0%	30/15 Summer			
12.003	PI OUT	15 Summer	30	+0%	30/15 Summer			
12.004	S24	15 Summer	30	+0%	30/15 Summer			
12.005	S25	15 Summer	30	+0%	30/15 Summer			
14.000	SP	15 Summer	30	+0%	30/15 Summer			
14.001	S21	15 Summer	30	+0%	30/15 Summer			
12.006	S22	120 Winter	30	+0%	1/15 Summer			
15.000	SP	15 Summer	30	+0%	30/15 Summer	30/15 Summer		
16.000	SP	15 Summer	30	+0%	30/15 Summer			
15.001	S17	15 Summer	30	+0%	2/15 Summer			
15.002	PI IN	240 Winter	30	+0%	30/15 Summer			
15.003	PI OUT	240 Winter	30	+0%	30/15 Summer			
17.000	SP	15 Summer	30	+0%	30/15 Summer			
17.001	S16	15 Summer	30	+0%	30/15 Summer			
18.000	S11	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
19.000	SP	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
18.001	S12	15 Summer	30	+0%	30/15 Summer			
18.002	S13	15 Summer	30	+0%	30/15 Summer			
18.003	S14	15 Summer	30	+0%	2/15 Summer			
15.004	S15	240 Winter	30	+0%	1/15 Summer			
1.010	S5	180 Winter	30	+0%	100/60 Summer			
1.011	S6	180 Winter	30	+0%	30/60 Summer			
1.012	S7	180 Winter	30	+0%	30/30 Summer			
1.013	PI IN	180 Winter	30	+0%				
1.014	PI OUT	180 Winter	30	+0%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
7.003	S104	28.826	0.046	0.000	1.00		16.7	SURCHARGED	
7.004	S105	28.643	0.063	0.000	1.12		23.1	SURCHARGED	
8.000	S106	29.402	-0.098	0.000	0.26		4.2	OK	
8.001	S107	29.261	-0.099	0.000	0.26		4.2	OK	
8.002	S108	29.115	-0.055	0.000	0.70		11.9	OK	
8.003	S109	28.821	-0.054	0.000	0.72		11.9	OK	
8.004	S110	28.664	-0.046	0.000	0.79		18.8	OK	
9.000	SP	29.672	0.122	0.000	0.96		17.2	FLOOD RISK	3
10.000	SP	29.800	0.310	0.000	1.41		49.3	SURCHARGED	
9.001	S34	29.667	0.242	0.000	1.26		51.7	SURCHARGED	
9.002	PI IN	29.459	0.164	0.000	1.64		51.6	SURCHARGED	
9.003	PI OUT	29.324	0.079	0.000	1.73		51.7	SURCHARGED	
11.000	S31	30.403	0.553	0.000	1.61		64.7	SURCHARGED	1
11.001	S32	29.821	0.241	0.000	1.65		139.1	SURCHARGED	
9.004	S33	29.216	0.741	0.000	0.43		16.7	SURCHARGED	
1.006	S1	28.343	0.008	0.000	0.09		59.1	SURCHARGED	
1.007	S2	28.339	0.004	0.000	0.08		52.4	SURCHARGED	
1.008	S3	28.335	0.000	0.000	0.07		50.4	OK	
1.009	S4	28.299	-0.036	0.000	0.11		45.6	OK	
12.000	SP	29.675	0.125	0.335	1.18		19.0	FLOOD	6
13.000	SP	29.871	0.381	0.000	1.51		54.1	SURCHARGED	
12.001	S23	29.719	0.294	0.000	1.57		49.6	SURCHARGED	
12.002	PI IN	29.602	0.227	0.000	1.59		50.1	SURCHARGED	
12.003	PI OUT	29.489	0.164	0.000	1.60		50.4	SURCHARGED	
12.004	S24	29.378	0.103	0.000	1.27		50.6	SURCHARGED	
12.005	S25	29.255	0.075	0.000	1.15		84.8	SURCHARGED	
14.000	SP	29.492	0.227	0.000	1.38		24.8	SURCHARGED	
14.001	S21	29.225	0.100	0.000	1.41		24.7	SURCHARGED	
12.006	S22	29.191	0.716	0.000	0.37		14.1	SURCHARGED	
15.000	SP	28.876	0.301	0.665	1.35		21.7	FLOOD	22
16.000	SP	29.092	0.402	0.000	1.17		74.5	SURCHARGED	
15.001	S17	28.769	0.304	0.000	1.76		90.8	SURCHARGED	
15.002	PI IN	28.652	0.202	0.000	0.33		20.2	SURCHARGED	
15.003	PI OUT	28.651	0.251	0.000	0.39		20.2	SURCHARGED	
17.000	SP	28.760	0.020	0.000	0.83		35.2	SURCHARGED	
17.001	S16	28.656	0.006	0.000	1.13		35.5	SURCHARGED	
18.000	S11	29.757	0.812	0.000	1.64		62.8	SURCHARGED	3
19.000	SP	29.685	0.710	0.000	1.29		26.8	FLOOD RISK	4
18.001	S12	29.530	0.715	0.000	1.52		184.0	SURCHARGED	
18.002	S13	29.130	0.480	0.000	1.57		184.5	SURCHARGED	
18.003	S14	28.836	0.306	0.000	2.22		238.3	SURCHARGED	
15.004	S15	28.650	0.975	0.000	0.28		11.0	SURCHARGED	
1.010	S5	28.267	-0.068	0.000	0.10		66.3	OK	
1.011	S6	28.184	0.249	0.000	0.28		67.5	SURCHARGED	
1.012	S7	28.173	0.443	0.000	0.67		67.1	SURCHARGED	
1.013	PI IN	27.457	-0.258	0.000	0.38		67.0	OK	
1.014	PI OUT	27.437	-0.178	0.000	0.67		66.9	OK	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	3.000
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	4
Number of Online Controls	5	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	0.438
Region	England and Wales	Cv (Summer)	0.925
M5-60 (mm)	20.700	Cv (Winter)	0.925

Margin for Flood Risk Warning (mm)	75.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 2, 30, 100
Climate Change (%)	0, 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	SP	15 Summer	100	+0%	30/15 Summer	30/15 Summer		
2.000	SP	15 Summer	100	+0%	30/15 Summer	100/15 Summer		
1.001	S46	15 Summer	100	+0%	2/15 Summer			
1.002	PI IN	120 Winter	100	+0%	30/15 Summer			
1.003	PI OUT	120 Winter	100	+0%	30/15 Summer			
3.000	SP	15 Summer	100	+0%	30/15 Summer			
4.000	SP	15 Summer	100	+0%	30/15 Summer	100/15 Summer		
3.001	S44	15 Summer	100	+0%	2/15 Summer			
3.002	PI IN	15 Summer	100	+0%	30/15 Summer			
3.003	PI OUT	15 Summer	100	+0%	100/15 Summer			
1.004	S45	120 Winter	100	+0%	30/15 Summer			
5.000	S43	15 Summer	100	+0%	100/15 Summer			
6.000	S41	15 Summer	100	+0%	30/15 Summer			
1.005	S42	120 Winter	100	+0%	1/30 Summer			
7.000	S101	15 Summer	100	+0%				
7.001	S102	15 Summer	100	+0%	100/15 Summer			
7.002	S103	15 Summer	100	+0%	30/15 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SP	29.940	0.240	14.634	1.18		47.8	FLOOD	8
2.000	SP	30.493	0.753	2.993	1.98		159.2	FLOOD	3
1.001	S46	29.986	0.376	0.000	1.86		143.0	SURCHARGED	
1.002	PI IN	29.897	0.307	0.000	0.68		73.4	SURCHARGED	
1.003	PI OUT	29.810	0.270	0.000	0.66		73.3	SURCHARGED	
3.000	SP	30.776	0.666	0.000	1.26		46.6	SURCHARGED	
4.000	SP	31.006	0.751	0.738	1.39		33.8	FLOOD	3
3.001	S44	30.605	0.595	0.000	2.47		77.9	SURCHARGED	
3.002	PI IN	30.297	0.337	0.000	1.75		77.8	SURCHARGED	
3.003	PI OUT	29.997	0.137	0.000	1.03		77.6	SURCHARGED	
1.004	S45	29.728	0.303	0.000	1.08		104.8	SURCHARGED	
5.000	S43	30.254	0.069	0.000	1.09		92.3	SURCHARGED	
6.000	S41	30.241	0.281	0.000	1.76		90.9	SURCHARGED	
1.005	S42	29.722	0.922	0.000	0.44		54.6	SURCHARGED	
7.000	S101	29.579	-0.096	0.000	0.23		4.0	OK	
7.001	S102	29.557	0.172	0.000	0.99		17.1	SURCHARGED	
7.002	S103	29.151	0.196	0.000	1.11		18.3	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.003	S104	15 Summer	100	+0%	30/15 Summer			
7.004	S105	15 Summer	100	+0%	30/15 Summer			
8.000	S106	15 Summer	100	+0%				
8.001	S107	15 Summer	100	+0%				
8.002	S108	15 Summer	100	+0%				
8.003	S109	15 Summer	100	+0%				
8.004	S110	15 Summer	100	+0%				
9.000	SP	15 Summer	100	+0%	30/15 Summer	100/15 Summer		
10.000	SP	15 Summer	100	+0%	30/15 Summer			
9.001	S34	15 Summer	100	+0%	30/15 Summer			
9.002	PI IN	15 Summer	100	+0%	2/15 Summer			
9.003	PI OUT	180 Winter	100	+0%	30/15 Summer			
11.000	S31	15 Summer	100	+0%	30/15 Summer	100/15 Summer		
11.001	S32	15 Summer	100	+0%	30/15 Summer			
9.004	S33	180 Winter	100	+0%	1/15 Summer			
1.006	S1	180 Winter	100	+0%	30/120 Summer			
1.007	S2	180 Winter	100	+0%	30/120 Summer			
1.008	S3	180 Winter	100	+0%	100/60 Summer			
1.009	S4	180 Winter	100	+0%	100/60 Summer			
12.000	SP	15 Summer	100	+0%	30/15 Summer	30/15 Summer		
13.000	SP	15 Summer	100	+0%	2/15 Summer			
12.001	S23	15 Summer	100	+0%	2/15 Summer			
12.002	PI IN	15 Summer	100	+0%	30/15 Summer			
12.003	PI OUT	15 Summer	100	+0%	30/15 Summer			
12.004	S24	15 Summer	100	+0%	30/15 Summer			
12.005	S25	120 Summer	100	+0%	30/15 Summer			
14.000	SP	15 Summer	100	+0%	30/15 Summer			
14.001	S21	120 Winter	100	+0%	30/15 Summer			
12.006	S22	120 Winter	100	+0%	1/15 Summer			
15.000	SP	360 Summer	100	+0%	30/15 Summer	30/15 Summer		
16.000	SP	15 Summer	100	+0%	30/15 Summer			
15.001	S17	180 Winter	100	+0%	2/15 Summer			
15.002	PI IN	180 Winter	100	+0%	30/15 Summer			
15.003	PI OUT	180 Winter	100	+0%	30/15 Summer			
17.000	SP	180 Winter	100	+0%	30/15 Summer			
17.001	S16	180 Winter	100	+0%	30/15 Summer			
18.000	S11	15 Summer	100	+0%	30/15 Summer	100/15 Summer		
19.000	SP	15 Summer	100	+0%	30/15 Summer	100/15 Summer		
18.001	S12	15 Summer	100	+0%	30/15 Summer			
18.002	S13	15 Summer	100	+0%	30/15 Summer			
18.003	S14	180 Winter	100	+0%	2/15 Summer			
15.004	S15	180 Winter	100	+0%	1/15 Summer			
1.010	S5	180 Winter	100	+0%	100/60 Summer			
1.011	S6	180 Winter	100	+0%	30/60 Summer			
1.012	S7	180 Winter	100	+0%	30/30 Summer			
1.013	PI IN	180 Winter	100	+0%				
1.014	PI OUT	180 Winter	100	+0%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
7.003	S104	28.953	0.173	0.000	1.13		18.8	SURCHARGED	
7.004	S105	28.737	0.157	0.000	1.27		26.1	SURCHARGED	
8.000	S106	29.410	-0.090	0.000	0.34		5.5	OK	
8.001	S107	29.269	-0.091	0.000	0.33		5.5	OK	
8.002	S108	29.135	-0.035	0.000	0.90		15.4	OK	
8.003	S109	28.843	-0.032	0.000	0.93		15.3	OK	
8.004	S110	28.706	-0.004	0.000	1.00		23.8	OK	
9.000	SP	29.680	0.130	5.306	1.40		24.9	FLOOD	3
10.000	SP	29.991	0.501	0.000	1.89		66.2	SURCHARGED	
9.001	S34	29.753	0.328	0.000	1.37		56.3	SURCHARGED	
9.002	PI IN	29.508	0.213	0.000	1.78		56.2	SURCHARGED	
9.003	PI OUT	29.448	0.203	0.000	0.66		19.7	SURCHARGED	
11.000	S31	30.851	1.001	0.828	2.00		80.6	FLOOD	1
11.001	S32	30.036	0.456	0.000	2.06		174.2	SURCHARGED	
9.004	S33	29.445	0.970	0.000	0.51		19.6	SURCHARGED	
1.006	S1	28.531	0.196	0.000	0.13		88.1	SURCHARGED	
1.007	S2	28.525	0.190	0.000	0.13		89.6	SURCHARGED	
1.008	S3	28.519	0.184	0.000	0.13		92.2	SURCHARGED	
1.009	S4	28.512	0.177	0.000	0.22		90.6	SURCHARGED	
12.000	SP	29.683	0.133	8.399	1.34		21.7	FLOOD	6
13.000	SP	30.126	0.636	0.000	1.97		70.8	SURCHARGED	
12.001	S23	29.870	0.445	0.000	1.67		52.6	SURCHARGED	
12.002	PI IN	29.743	0.368	0.000	1.70		53.6	SURCHARGED	
12.003	PI OUT	29.622	0.297	0.000	1.73		54.4	SURCHARGED	
12.004	S24	29.511	0.236	0.000	1.38		55.2	SURCHARGED	
12.005	S25	29.459	0.279	0.000	0.75		55.6	SURCHARGED	
14.000	SP	29.778	0.513	0.000	1.73		31.1	SURCHARGED	
14.001	S21	29.435	0.310	0.000	0.63		11.0	SURCHARGED	
12.006	S22	29.428	0.953	0.000	0.43		16.7	SURCHARGED	
15.000	SP	28.916	0.341	41.226	0.53		8.5	FLOOD	22
16.000	SP	29.430	0.740	0.000	1.54		97.8	FLOOD RISK	
15.001	S17	28.957	0.492	0.000	0.64		32.9	SURCHARGED	
15.002	PI IN	28.960	0.510	0.000	0.53		32.5	SURCHARGED	
15.003	PI OUT	28.965	0.565	0.000	0.62		32.2	SURCHARGED	
17.000	SP	28.972	0.232	0.000	0.26		11.1	SURCHARGED	
17.001	S16	28.970	0.320	0.000	0.35		11.1	SURCHARGED	
18.000	S11	29.950	1.005	5.508	2.08		79.7	FLOOD	3
19.000	SP	29.731	0.756	6.450	2.09		43.3	FLOOD	4
18.001	S12	29.891	1.076	0.000	1.71		207.6	FLOOD RISK	
18.002	S13	29.375	0.725	0.000	1.75		205.6	SURCHARGED	
18.003	S14	29.013	0.483	0.000	0.80		85.9	SURCHARGED	
15.004	S15	28.969	1.294	0.000	0.28		11.0	SURCHARGED	
1.010	S5	28.507	0.172	0.000	0.17		117.1	SURCHARGED	
1.011	S6	28.499	0.564	0.000	0.43		104.7	SURCHARGED	
1.012	S7	28.477	0.747	0.000	1.05		104.5	SURCHARGED	
1.013	PI IN	27.634	-0.081	0.000	0.59		104.3	OK	
1.014	PI OUT	27.608	-0.007	0.000	1.05		104.3	OK	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	3.000
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	4
Number of Online Controls	5	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 0.438
Region	England and Wales	Cv (Summer)	0.925
M5-60 (mm)	20.700	Cv (Winter)	0.925

Margin for Flood Risk Warning (mm)	75.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	SP	60 Summer	100	+20%	100/15 Summer	100/15 Summer		
2.000	SP	15 Summer	100	+20%	100/15 Summer	100/15 Summer		
1.001	S46	30 Summer	100	+20%	100/15 Summer			
1.002	PI IN	120 Summer	100	+20%	100/15 Summer			
1.003	PI OUT	120 Winter	100	+20%	100/15 Summer			
3.000	SP	15 Summer	100	+20%	100/15 Summer			
4.000	SP	15 Summer	100	+20%	100/15 Summer	100/15 Summer		
3.001	S44	15 Winter	100	+20%	100/15 Summer			
3.002	PI IN	15 Summer	100	+20%	100/15 Summer			
3.003	PI OUT	30 Summer	100	+20%	100/15 Summer			
1.004	S45	120 Winter	100	+20%	100/15 Summer			
5.000	S43	15 Summer	100	+20%	100/15 Summer			
6.000	S41	15 Summer	100	+20%	100/15 Summer			
1.005	S42	120 Winter	100	+20%	100/15 Summer			
7.000	S101	15 Summer	100	+20%	100/15 Summer			
7.001	S102	15 Summer	100	+20%	100/15 Summer			
7.002	S103	15 Summer	100	+20%	100/15 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SP	29.950	0.250	25.473	0.56		22.6	FLOOD	15
2.000	SP	30.503	0.763	12.826	1.98		159.8	FLOOD	4
1.001	S46	30.015	0.405	0.000	1.87		143.5	SURCHARGED	
1.002	PI IN	29.998	0.408	0.000	1.08		116.0	SURCHARGED	
1.003	PI OUT	29.944	0.404	0.000	0.78		86.5	SURCHARGED	
3.000	SP	30.858	0.748	0.000	1.39		51.6	FLOOD RISK	
4.000	SP	31.009	0.754	3.861	1.62		39.2	FLOOD	4
3.001	S44	30.672	0.662	0.000	2.54		80.1	SURCHARGED	
3.002	PI IN	30.354	0.394	0.000	1.79		79.9	SURCHARGED	
3.003	PI OUT	30.035	0.175	0.000	1.06		80.0	SURCHARGED	
1.004	S45	29.933	0.508	0.000	1.26		121.4	SURCHARGED	
5.000	S43	30.438	0.253	0.000	1.30		110.2	SURCHARGED	
6.000	S41	30.420	0.460	0.000	2.10		108.6	SURCHARGED	
1.005	S42	29.928	1.128	0.000	0.44		54.6	SURCHARGED	
7.000	S101	29.888	0.213	0.000	0.32		5.5	SURCHARGED	
7.001	S102	29.867	0.482	0.000	1.10		19.0	SURCHARGED	
7.002	S103	29.354	0.399	0.000	1.24		20.4	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.003	S104	15 Summer	100	+20%	100/15 Summer			
7.004	S105	15 Summer	100	+20%	100/15 Summer			
8.000	S106	15 Summer	100	+20%				
8.001	S107	15 Summer	100	+20%				
8.002	S108	15 Summer	100	+20%	100/15 Summer			
8.003	S109	15 Summer	100	+20%	100/15 Summer			
8.004	S110	15 Summer	100	+20%	100/15 Summer			
9.000	SP	15 Summer	100	+20%	100/15 Summer	100/15 Summer		
10.000	SP	15 Summer	100	+20%	100/15 Summer			
9.001	S34	15 Summer	100	+20%	100/15 Summer			
9.002	PI IN	180 Winter	100	+20%	100/15 Summer			
9.003	PI OUT	180 Winter	100	+20%	100/15 Summer			
11.000	S31	15 Summer	100	+20%	100/15 Summer	100/15 Summer		
11.001	S32	15 Summer	100	+20%	100/15 Summer			
9.004	S33	180 Winter	100	+20%	100/15 Summer			
1.006	S1	180 Winter	100	+20%	100/30 Summer			
1.007	S2	180 Winter	100	+20%	100/30 Summer			
1.008	S3	180 Winter	100	+20%	100/30 Summer			
1.009	S4	180 Winter	100	+20%	100/30 Summer			
12.000	SP	30 Summer	100	+20%	100/15 Summer	100/15 Summer		
13.000	SP	15 Summer	100	+20%	100/15 Summer			
12.001	S23	15 Summer	100	+20%	100/15 Summer			
12.002	PI IN	15 Summer	100	+20%	100/15 Summer			
12.003	PI OUT	15 Summer	100	+20%	100/15 Summer			
12.004	S24	180 Winter	100	+20%	100/15 Summer			
12.005	S25	180 Winter	100	+20%	100/15 Summer			
14.000	SP	15 Summer	100	+20%	100/15 Summer	100/15 Summer		
14.001	S21	180 Winter	100	+20%	100/15 Summer			
12.006	S22	180 Winter	100	+20%	100/15 Summer			
15.000	SP	360 Winter	100	+20%	100/15 Summer	100/15 Summer		
16.000	SP	15 Summer	100	+20%	100/15 Summer	100/15 Summer		
15.001	S17	180 Winter	100	+20%	100/15 Summer			
15.002	PI IN	180 Winter	100	+20%	100/15 Summer			
15.003	PI OUT	180 Winter	100	+20%	100/15 Summer			
17.000	SP	180 Winter	100	+20%	100/15 Summer			
17.001	S16	180 Winter	100	+20%	100/15 Summer			
18.000	S11	15 Summer	100	+20%	100/15 Summer	100/15 Summer		
19.000	SP	15 Summer	100	+20%	100/15 Summer	100/15 Summer		
18.001	S12	15 Summer	100	+20%	100/15 Summer	100/15 Summer		
18.002	S13	180 Winter	100	+20%	100/15 Summer			
18.003	S14	180 Winter	100	+20%	100/15 Summer			
15.004	S15	180 Winter	100	+20%	100/15 Summer			
1.010	S5	180 Winter	100	+20%	100/30 Summer			
1.011	S6	180 Winter	100	+20%	100/15 Summer			
1.012	S7	180 Winter	100	+20%	100/15 Summer			
1.013	PI IN	180 Winter	100	+20%	100/120 Summer			
1.014	PI OUT	120 Summer	100	+20%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
7.003	S104	29.095	0.315	0.000	1.24		20.7	SURCHARGED	
7.004	S105	28.849	0.269	0.000	1.42		29.3	SURCHARGED	
8.000	S106	29.416	-0.084	0.000	0.40		6.6	OK	
8.001	S107	29.276	-0.084	0.000	0.40		6.6	OK	
8.002	S108	29.233	0.063	0.000	0.99		16.9	SURCHARGED	
8.003	S109	28.944	0.069	0.000	1.05		17.4	SURCHARGED	
8.004	S110	28.786	0.076	0.000	1.09		26.0	SURCHARGED	
9.000	SP	29.685	0.135	9.718	1.42		25.3	FLOOD	7
10.000	SP	30.170	0.680	0.000	2.26		79.4	FLOOD RISK	
9.001	S34	29.830	0.405	0.000	1.47		60.1	SURCHARGED	
9.002	PI IN	29.674	0.379	0.000	0.74		23.4	SURCHARGED	
9.003	PI OUT	29.671	0.426	0.000	0.77		23.1	SURCHARGED	
11.000	S31	30.856	1.006	6.411	2.08		83.8	FLOOD	4
11.001	S32	30.241	0.661	0.000	2.38		200.7	SURCHARGED	
9.004	S33	29.667	1.192	0.000	0.52		19.8	SURCHARGED	
1.006	S1	28.698	0.363	0.000	0.14		97.2	SURCHARGED	
1.007	S2	28.691	0.356	0.000	0.15		99.3	SURCHARGED	
1.008	S3	28.685	0.350	0.000	0.15		104.9	SURCHARGED	
1.009	S4	28.677	0.342	0.000	0.25		101.3	SURCHARGED	
12.000	SP	29.689	0.139	13.631	1.09		17.7	FLOOD	10
13.000	SP	30.239	0.749	0.000	2.21		79.3	FLOOD RISK	
12.001	S23	29.970	0.545	0.000	1.83		57.7	SURCHARGED	
12.002	PI IN	29.853	0.478	0.000	1.83		57.7	SURCHARGED	
12.003	PI OUT	29.738	0.413	0.000	1.84		57.9	SURCHARGED	
12.004	S24	29.666	0.391	0.000	0.59		23.7	SURCHARGED	
12.005	S25	29.658	0.478	0.000	0.47		34.9	SURCHARGED	
14.000	SP	30.015	0.750	0.160	2.00		36.0	FLOOD	1
14.001	S21	29.652	0.527	0.000	0.51		9.0	SURCHARGED	
12.006	S22	29.643	1.168	0.000	0.43		16.7	SURCHARGED	
15.000	SP	29.012	0.437	136.868	0.67		10.8	FLOOD	24
16.000	SP	29.443	0.753	3.219	1.59		101.0	FLOOD	2
15.001	S17	29.407	0.942	0.000	0.71		36.8	SURCHARGED	
15.002	PI IN	29.431	0.981	0.000	0.59		36.1	SURCHARGED	
15.003	PI OUT	29.460	1.060	0.000	0.69		35.7	SURCHARGED	
17.000	SP	29.487	0.747	0.000	0.32		13.3	FLOOD RISK	
17.001	S16	29.484	0.834	0.000	0.42		13.3	SURCHARGED	
18.000	S11	29.961	1.016	16.241	2.09		80.0	FLOOD	5
19.000	SP	29.737	0.762	12.298	2.24		46.6	FLOOD	6
18.001	S12	29.947	1.132	2.473	1.72		208.1	FLOOD	2
18.002	S13	29.653	1.003	0.000	0.65		76.6	SURCHARGED	
18.003	S14	29.576	1.046	0.000	0.92		98.8	SURCHARGED	
15.004	S15	29.483	1.808	0.000	0.33		12.9	SURCHARGED	
1.010	S5	28.671	0.336	0.000	0.19		127.2	SURCHARGED	
1.011	S6	28.661	0.726	0.000	0.52		126.4	SURCHARGED	
1.012	S7	28.634	0.904	0.000	1.27		126.4	FLOOD RISK	
1.013	PI IN	27.728	0.013	0.000	0.71		126.4	SURCHARGED	
1.014	PI OUT	27.615	0.000	0.000	1.20		119.3	OK	

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