















Barter Hill Partnership Ltd		Page 0
15 Meridian Way Meridian Business Park Norwich Norfolk NR7 0TA	Land at Thanet Way Whitstable, Kent	
Date 30/04/2020 16:53 File 2020.04.30 - SURFACE WA...	Designed by AR Checked by NR	
Micro Drainage		Network 2019.1

STORM SEWER DESIGN by the Modified Rational Method


Network Design Table for Surface Network 3

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	30.609	0.475	64.4	0.059	5.00	0.0	0.600		o	225	Pipe/Conduit	
2.000	18.115	0.925	19.6	0.128	5.00	0.0	0.600		o	225	Pipe/Conduit	
1.001	11.496	0.270	42.6	0.023	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.002	15.511	0.355	43.7	0.036	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.003	46.705	1.450	32.2	0.157	0.00	0.0	0.600		o	375	Pipe/Conduit	
1.004	23.580	2.159	10.9	0.057	0.00	0.0	0.600		o	375	Pipe/Conduit	
3.000	27.541	0.069	399.1	0.217	5.00	0.0	0.600		o	525	Pipe/Conduit	
1.005	26.456	0.066	400.8	0.079	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.006	38.670	0.105	368.3	0.062	0.00	0.0	0.600		o	525	Pipe/Conduit	
4.000	40.104	3.535	11.3	0.075	5.00	0.0	0.600		o	225	Pipe/Conduit	
4.001	37.509	1.630	23.0	0.129	0.00	0.0	0.600		o	300	Pipe/Conduit	
4.002	36.859	1.483	24.9	0.170	0.00	0.0	0.600		o	375	Pipe/Conduit	
1.007	26.315	0.065	404.8	0.119	0.00	0.0	0.600		o	525	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	33.190	0.059	0.0	0.0	0.0	1.63	64.9	8.0
2.000	50.00	5.10	33.640	0.128	0.0	0.0	0.0	2.97	118.1	17.3
1.001	50.00	5.39	32.640	0.210	0.0	0.0	0.0	2.42	170.8	28.4
1.002	50.00	5.50	32.370	0.246	0.0	0.0	0.0	2.39	168.6	33.3
1.003	50.00	5.74	31.940	0.403	0.0	0.0	0.0	3.20	353.7	54.6
1.004	50.00	5.81	30.490	0.460	0.0	0.0	0.0	5.51	608.4	62.3
3.000	50.00	5.41	28.250	0.217	0.0	0.0	0.0	1.11	241.4	29.4
1.005	50.00	6.21	28.181	0.756	0.0	0.0	0.0	1.11	240.8	102.4
1.006	50.00	6.77	28.115	0.818	0.0	0.0	0.0	1.16	251.4	110.8
4.000	50.00	5.17	36.900	0.075	0.0	0.0	0.0	3.91	155.3	10.2
4.001	50.00	5.36	33.290	0.204	0.0	0.0	0.0	3.29	232.7	27.6
4.002	50.00	5.53	31.585	0.374	0.0	0.0	0.0	3.65	402.8	50.6
1.007	50.00	7.16	28.010	1.311	0.0	0.0	0.0	1.11	239.6	177.5

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Micro Drainage		Network 2019.1


STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Surface Network 3

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.008	19.090	0.055	347.1	0.018	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.009	22.846	1.850	12.3	0.018	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.010	17.669	1.540	11.5	0.035	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.011	20.735	1.410	14.7	0.076	0.00	0.0	0.600		o	300	Pipe/Conduit	
5.000	40.785	0.204	199.9	0.207	5.00	0.0	0.600		o	300	Pipe/Conduit	
1.012	34.953	0.490	71.3	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.013	32.108	2.404	13.4	0.132	0.00	0.0	0.600		o	300	Pipe/Conduit	
6.000	21.471	0.390	55.1	0.092	5.00	0.0	0.600		o	300	Pipe/Conduit	
6.001	60.695	1.210	50.2	0.159	0.00	0.0	0.600		o	300	Pipe/Conduit	
6.002	35.129	2.910	12.1	0.113	0.00	0.0	0.600		o	300	Pipe/Conduit	
6.003	15.260	0.610	25.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
6.004	6.820	0.377	18.1	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
7.000	13.432	0.072	186.6	0.068	5.00	0.0	0.600		o	300	Pipe/Conduit	
7.001	15.028	0.061	246.4	0.028	0.00	0.0	0.600		o	300	Pipe/Conduit	
6.005	32.360	0.108	299.6	0.068	0.00	0.0	0.600		o	450	Pipe/Conduit	
6.006	19.770	0.066	299.5	0.000	0.00	0.0	0.600		o	450	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)
1.008	50.00	7.43	27.945	1.329	0.0	0.0	0.0	1.20	259.0	180.0
1.009	50.00	7.49	27.890	1.347	0.0	0.0	0.0	6.40	1385.1	182.4
1.010	50.00	7.53	26.040	1.382	0.0	0.0	0.0	6.64	1437.1	187.1
1.011	50.00	7.62	24.500	1.458	0.0	0.0	0.0	4.12	291.3	197.4
5.000	50.00	5.61	23.294	0.207	0.0	0.0	0.0	1.11	78.3	28.0
1.012	50.00	7.93	23.090	1.665	0.0	0.0	0.0	1.86	131.8	225.5
1.013	50.00	8.05	22.600	1.797	0.0	0.0	0.0	4.32	305.7	243.3
6.000	50.00	5.17	25.940	0.092	0.0	0.0	0.0	2.12	150.1	12.5
6.001	50.00	5.62	25.550	0.251	0.0	0.0	0.0	2.23	157.3	34.0
6.002	50.00	5.75	24.340	0.364	0.0	0.0	0.0	4.55	321.6	49.3
6.003	50.00	5.83	21.430	0.364	0.0	0.0	0.0	3.16	223.1	49.3
6.004	50.00	5.86	20.820	0.364	0.0	0.0	0.0	3.71	262.5	49.3
7.000	50.00	5.20	20.576	0.068	0.0	0.0	0.0	1.15	81.1	9.2
7.001	50.00	5.45	20.504	0.096	0.0	0.0	0.0	1.00	70.5	13.0
6.005	50.00	6.32	20.293	0.528	0.0	0.0	0.0	1.17	186.0	71.5
6.006	50.00	6.61	20.185	0.528	0.0	0.0	0.0	1.17	186.0	71.5

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STORM SEWER DESIGN by the Modified Rational Method

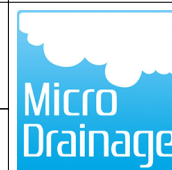
Network Design Table for Surface Network 3

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
6.007	22.018	0.073	301.6	0.049	0.00	0.0	0.600		o	450	Pipe/Conduit	
1.014	22.881	1.402	16.3	0.034	0.00	0.0	0.600		o	450	Pipe/Conduit	
1.015	21.744	0.067	324.5	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.016	16.171	0.114	141.9	0.060	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.017	25.238	0.111	227.4	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.018	3.602	0.360	10.0	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.019	13.633	0.088	154.9	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
1.020	55.297	0.332	166.6	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
1.021	11.391	0.068	167.5	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
1.022	20.832	0.125	166.7	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
8.000	8.345	0.080	104.3	0.035	5.00	0.0	0.600		o	150	Pipe/Conduit	
8.001	6.056	0.090	67.3	0.000	0.00	0.0		0.045	3 \=/	150	1:3 Swale	
8.002	3.981	0.280	14.2	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit	
8.003	7.138	0.268	26.6	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit	
1.023	5.872	0.035	167.8	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
6.007	50.00	6.92	20.119	0.577	0.0	0.0	0.0	1.17	185.3	78.1
1.014	50.00	8.13	20.046	2.408	0.0	0.0	0.0	5.05	803.5	326.1
1.015	50.00	8.42	18.632	2.408	0.0	0.0	0.0	1.24	268.0	326.1
1.016	50.00	8.56	18.565	2.468	0.0	0.0	0.0	1.88	406.7	334.2
1.017	50.00	8.85	18.451	2.468	0.0	0.0	0.0	1.48	320.7	334.2
1.018	50.00	8.86	18.340	2.468	0.0	0.0	0.0	7.11	1539.1	334.2
1.019	50.00	8.98	17.980	2.468	0.0	0.0	0.0	1.80	389.0	334.2
1.020	50.00	9.89	17.892	2.468	0.0	0.0	0.0	1.01	40.2	334.2
1.021	50.00	10.08	17.560	2.468	0.0	0.0	0.0	1.01	40.1	334.2
1.022	50.00	10.43	17.492	2.468	0.0	0.0	0.0	1.01	40.2	334.2
8.000	50.00	5.14	18.160	0.035	0.0	0.0	0.0	0.98	17.4	4.7
8.001	50.00	5.34	18.080	0.035	0.0	0.0	0.0	0.51	46.0	4.7
8.002	50.00	5.36	17.990	0.035	0.0	0.0	0.0	2.69	47.5	4.7
8.003	50.00	5.42	17.710	0.035	0.0	0.0	0.0	1.96	34.6	4.7
1.023	50.00	10.52	17.367	2.503	0.0	0.0	0.0	1.01	40.0	338.9

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Manhole Schedules for Surface Network 3

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backd (mm)
ASW1	34.825	1.635	Open Manhole	1200	1.000	33.190	225				
ASW2	35.230	1.590	Open Manhole	1200	2.000	33.640	225				
ASW3	34.193	1.553	Open Manhole	1200	1.001	32.640	300	1.000	32.715	225	
								2.000	32.715	225	
ASW4	33.951	1.581	Open Manhole	1200	1.002	32.370	300	1.001	32.370	300	
ASW5	33.535	1.595	Open Manhole	1350	1.003	31.940	375	1.002	32.015	300	
ASW6	32.085	1.595	Open Manhole	1350	1.004	30.490	375	1.003	30.490	375	
ASW7	30.714	2.464	Open Manhole	1350	3.000	28.250	525				
ASW8	31.388	3.207	Open Manhole	1500	1.005	28.181	525	1.004	28.331	375	
								3.000	28.181	525	
ASW9	32.023	3.908	Open Manhole	1500	1.006	28.115	525	1.005	28.115	525	
ASW10	38.141	1.241	Open Manhole	1200	4.000	36.900	225				
ASW11	34.838	1.548	Open Manhole	1200	4.001	33.290	300	4.000	33.365	225	
ASW12	33.198	1.613	Open Manhole	1200	4.002	31.585	375	4.001	31.660	300	
ASW13	31.845	3.835	Open Manhole	1500	1.007	28.010	525	1.006	28.010	525	
								4.002	30.102	375	
ASW14	30.923	2.978	Open Manhole	1500	1.008	27.945	525	1.007	27.945	525	
ASW15	30.173	2.283	Open Manhole	1500	1.009	27.890	525	1.008	27.890	525	
ASW16	29.135	3.095	Open Manhole	1500	1.010	26.040	525	1.009	26.040	525	
ASW17 HYDRO	28.360	3.860	Open Manhole	1500	1.011	24.500	300	1.010	24.500	525	
ASW18	25.726	2.432	Open Manhole	1200	5.000	23.294	300				
ASW19	27.331	4.241	Open Manhole	1350	1.012	23.090	300	1.011	23.090	300	
								5.000	23.090	300	
ASW20	25.512	2.912	Open Manhole	1350	1.013	22.600	300	1.012	22.600	300	
ASW21	27.508	1.568	Open Manhole	1200	6.000	25.940	300				
ASW22	27.265	1.715	Open Manhole	1200	6.001	25.550	300	6.000	25.550	300	
ASW23	26.536	2.196	Open Manhole	1350	6.002	24.340	300	6.001	24.340	300	
ASW24	23.400	1.970	Open Manhole	1350	6.003	21.430	300	6.002	21.430	300	
ASW25	23.812	2.992	Open Manhole	1350	6.004	20.820	300	6.003	20.820	300	
ASW26	22.313	1.737	Open Manhole	1200	7.000	20.576	300				
ASW27	22.925	2.421	Open Manhole	1200	7.001	20.504	300	7.000	20.504	300	
ASW28	23.827	3.534	Open Manhole	1350	6.005	20.293	450	6.004	20.443	300	
								7.001	20.443	300	
ASW29	24.446	4.261	Open Manhole	1350	6.006	20.185	450	6.005	20.185	450	
8	24.110	3.991	Open Manhole	1350	6.007	20.119	450	6.006	20.119	450	
ASW31	22.956	2.910	Open Manhole	1350	1.014	20.046	450	1.013	20.196	300	
								6.007	20.046	450	
ASW32	21.166	2.534	Open Manhole	1500	1.015	18.632	525	1.014	18.644	450	

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Manhole Schedules for Surface Network 3

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Diameter (mm)	Back (mm)
ASW33	20.550	1.985	Open Manhole	1240 x 975	1.016	18.565	525	1.015	18.565	525	
ASW34	20.300	1.849	Open Manhole	1240 x 975	1.017	18.451	525	1.016	18.451	525	
ASW35	20.300	1.960	Open Manhole	1500	1.018	18.340	525	1.017	18.340	525	
ASW36	20.300	2.320	Open Manhole	1500	1.019	17.980	525	1.018	17.980	525	
ASW37 HYDRO	20.300	2.408	Open Manhole	1200	1.020	17.892	225	1.019	17.892	525	
ASW38	19.319	1.759	Open Manhole	1200	1.021	17.560	225	1.020	17.560	225	
ASW39	19.150	1.658	Open Manhole	1200	1.022	17.492	225	1.021	17.492	225	
ASW40	19.050	0.890	Open Manhole	900 x 675	8.000	18.160	150				
ASW41	19.100	1.020	Open Manhole	1200	8.001	18.080	150	8.000	18.080	150	
ASW42	19.098	1.108	Open Manhole	900 x 675	8.002	17.990	150	8.001	17.990	150	
ASW43	19.002	1.292	Open Manhole	1200	8.003	17.710	150	8.002	17.710	150	
ASW44	19.189	1.822	Open Manhole	1200	1.023	17.367	225	1.022	17.367	225	
ASW45 HW6	18.730	1.398	Open Manhole	0		OUTFALL		8.003	17.442	150	
								1.023	17.332	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
ASW1	611299.323	164988.489	611299.323	164988.489	Required	
ASW2	611334.567	164987.433	611334.567	164987.433	Required	
ASW3	611326.045	165003.418	611326.045	165003.418	Required	
ASW4	611334.916	165010.730	611334.916	165010.730	Required	
ASW5	611341.038	165024.982	611341.038	165024.982	Required	
ASW6	611336.843	165071.498	611336.843	165071.498	Required	
ASW7	611302.959	165079.993	611302.959	165079.993	Required	

Manhole Schedules for Surface Network 3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
ASW8	611327.221	165093.026	611327.221	165093.026	Required	
ASW9	611351.026	165104.568	611351.026	165104.568	Required	
ASW10	611400.670	164995.653	611400.670	164995.653	Required	
ASW11	611395.655	165035.442	611395.655	165035.442	Required	
ASW12	611392.598	165072.826	611392.598	165072.826	Required	
ASW13	611389.375	165109.544	611389.375	165109.544	Required	
ASW14	611397.442	165134.592	611397.442	165134.592	Required	
ASW15	611385.823	165149.738	611385.823	165149.738	Required	
ASW16	611373.397	165168.910	611373.397	165168.910	Required	
ASW17 HYDRO	611368.690	165185.940	611368.690	165185.940	Required	
ASW18	611383.173	165242.296	611383.173	165242.296	Required	
ASW19	611364.213	165206.186	611364.213	165206.186	Required	
ASW20	611330.158	165214.056	611330.158	165214.056	Required	
ASW21	611326.889	165157.680	611326.889	165157.680	Required	
ASW22	611306.745	165150.249	611306.745	165150.249	Required	

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 Meridian Business Park
 Norwich Norfolk NR7 0TA

Land at Thanet Way
 Whitstable, Kent



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Micro Drainage









Network 2019.1


Manhole Schedules for Surface Network 3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
ASW23	611252.348	165123.325	611252.348	165123.325	Required	
ASW24	611236.508	165154.680	611236.508	165154.680	Required	
ASW25	611249.962	165161.880	611249.962	165161.880	Required	
ASW26	611255.825	165187.750	611255.825	165187.750	Required	
ASW27	611243.939	165181.492	611243.939	165181.492	Required	
ASW28	611251.524	165168.519	611251.524	165168.519	Required	
ASW29	611281.028	165181.812	611281.028	165181.812	Required	
8	611299.670	165188.394	611299.670	165188.394	Required	
ASW31	611298.263	165210.367	611298.263	165210.367	Required	
ASW32	611275.388	165209.843	611275.388	165209.843	Required	
ASW33	611274.344	165231.562	611274.344	165231.562	Required	
ASW34	611284.669	165244.008	611284.669	165244.008	Required	
ASW35	611306.981	165255.804	611306.981	165255.804	Required	
ASW36	611304.706	165258.596	611304.706	165258.596	Required	
ASW37 HYDRO	611291.544	165255.045	611291.544	165255.045	Required	

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Manhole Schedules for Surface Network 3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
ASW38	611254.234	165214.232	611254.234	165214.232	Required	
ASW39	611242.874	165213.389	611242.874	165213.389	Required	
ASW40	611243.621	165215.222	611243.621	165215.222	Required	
ASW41	611235.423	165216.780	611235.423	165216.780	Required	
ASW42	611232.760	165211.341	611232.760	165211.341	Required	
ASW43	611229.610	165208.907	611229.610	165208.907	Required	
ASW44	611224.092	165204.378	611224.092	165204.378	Required	
ASW45 HW6	611220.492	165209.017			No Entry	

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PIPELINE SCHEDULES for Surface Network 3

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	ASW1	34.825	33.190	1.410	Open Manhole	1200
2.000	o	225	ASW2	35.230	33.640	1.365	Open Manhole	1200
1.001	o	300	ASW3	34.193	32.640	1.253	Open Manhole	1200
1.002	o	300	ASW4	33.951	32.370	1.281	Open Manhole	1200
1.003	o	375	ASW5	33.535	31.940	1.220	Open Manhole	1350
1.004	o	375	ASW6	32.085	30.490	1.220	Open Manhole	1350
3.000	o	525	ASW7	30.714	28.250	1.939	Open Manhole	1350
1.005	o	525	ASW8	31.388	28.181	2.682	Open Manhole	1500
1.006	o	525	ASW9	32.023	28.115	3.383	Open Manhole	1500
4.000	o	225	ASW10	38.141	36.900	1.016	Open Manhole	1200
4.001	o	300	ASW11	34.838	33.290	1.248	Open Manhole	1200
4.002	o	375	ASW12	33.198	31.585	1.238	Open Manhole	1200
1.007	o	525	ASW13	31.845	28.010	3.310	Open Manhole	1500
1.008	o	525	ASW14	30.923	27.945	2.453	Open Manhole	1500
1.009	o	525	ASW15	30.173	27.890	1.758	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)
1.000	30.609	64.4	ASW3	34.193	32.715	1.253	Open Manhole	1200
2.000	18.115	19.6	ASW3	34.193	32.715	1.253	Open Manhole	1200
1.001	11.496	42.6	ASW4	33.951	32.370	1.281	Open Manhole	1200
1.002	15.511	43.7	ASW5	33.535	32.015	1.220	Open Manhole	1350
1.003	46.705	32.2	ASW6	32.085	30.490	1.220	Open Manhole	1350
1.004	23.580	10.9	ASW8	31.388	28.331	2.682	Open Manhole	1500
3.000	27.541	399.1	ASW8	31.388	28.181	2.682	Open Manhole	1500
1.005	26.456	400.8	ASW9	32.023	28.115	3.383	Open Manhole	1500
1.006	38.670	368.3	ASW13	31.845	28.010	3.310	Open Manhole	1500
4.000	40.104	11.3	ASW11	34.838	33.365	1.248	Open Manhole	1200
4.001	37.509	23.0	ASW12	33.198	31.660	1.238	Open Manhole	1200
4.002	36.859	24.9	ASW13	31.845	30.102	1.368	Open Manhole	1500
1.007	26.315	404.8	ASW14	30.923	27.945	2.453	Open Manhole	1500
1.008	19.090	347.1	ASW15	30.173	27.890	1.758	Open Manhole	1500
1.009	22.846	12.3	ASW16	29.135	26.040	2.570	Open Manhole	1500

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PIPELINE SCHEDULES for Surface Network 3

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)
1.010	o	525	ASW16	29.135	26.040	2.570	Open Manhole	1500
1.011	o	300	ASW17 HYDRO	28.360	24.500	3.560	Open Manhole	1500
5.000	o	300	ASW18	25.726	23.294	2.132	Open Manhole	1200
1.012	o	300	ASW19	27.331	23.090	3.941	Open Manhole	1350
1.013	o	300	ASW20	25.512	22.600	2.612	Open Manhole	1350
6.000	o	300	ASW21	27.508	25.940	1.268	Open Manhole	1200
6.001	o	300	ASW22	27.265	25.550	1.415	Open Manhole	1200
6.002	o	300	ASW23	26.536	24.340	1.896	Open Manhole	1350
6.003	o	300	ASW24	23.400	21.430	1.670	Open Manhole	1350
6.004	o	300	ASW25	23.812	20.820	2.692	Open Manhole	1350
7.000	o	300	ASW26	22.313	20.576	1.437	Open Manhole	1200
7.001	o	300	ASW27	22.925	20.504	2.121	Open Manhole	1200
6.005	o	450	ASW28	23.827	20.293	3.084	Open Manhole	1350
6.006	o	450	ASW29	24.446	20.185	3.811	Open Manhole	1350
6.007	o	450	8	24.110	20.119	3.541	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)
1.010	17.669	11.5	ASW17 HYDRO	28.360	24.500	3.335	Open Manhole	1500
1.011	20.735	14.7	ASW19	27.331	23.090	3.941	Open Manhole	1350
5.000	40.785	199.9	ASW19	27.331	23.090	3.941	Open Manhole	1350
1.012	34.953	71.3	ASW20	25.512	22.600	2.612	Open Manhole	1350
1.013	32.108	13.4	ASW31	22.956	20.196	2.460	Open Manhole	1350
6.000	21.471	55.1	ASW22	27.265	25.550	1.415	Open Manhole	1200
6.001	60.695	50.2	ASW23	26.536	24.340	1.896	Open Manhole	1350
6.002	35.129	12.1	ASW24	23.400	21.430	1.670	Open Manhole	1350
6.003	15.260	25.0	ASW25	23.812	20.820	2.692	Open Manhole	1350
6.004	6.820	18.1	ASW28	23.827	20.443	3.084	Open Manhole	1350
7.000	13.432	186.6	ASW27	22.925	20.504	2.121	Open Manhole	1200
7.001	15.028	246.4	ASW28	23.827	20.443	3.084	Open Manhole	1350
6.005	32.360	299.6	ASW29	24.446	20.185	3.811	Open Manhole	1350
6.006	19.770	299.5	8	24.110	20.119	3.541	Open Manhole	1350
6.007	22.018	301.6	ASW31	22.956	20.046	2.460	Open Manhole	1350



PIPELINE SCHEDULES for Surface Network 3

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)
1.014	o	450	ASW31	22.956	20.046	2.460	Open Manhole	1350
1.015	o	525	ASW32	21.166	18.632	2.009	Open Manhole	1500
1.016	o	525	ASW33	20.550	18.565	1.460	Open Manhole	1240 x 975
1.017	o	525	ASW34	20.300	18.451	1.324	Open Manhole	1240 x 975
1.018	o	525	ASW35	20.300	18.340	1.435	Open Manhole	1500
1.019	o	525	ASW36	20.300	17.980	1.795	Open Manhole	1500
1.020	o	225	ASW37 HYDRO	20.300	17.892	2.183	Open Manhole	1200
1.021	o	225	ASW38	19.319	17.560	1.534	Open Manhole	1200
1.022	o	225	ASW39	19.150	17.492	1.433	Open Manhole	1200
8.000	o	150	ASW40	19.050	18.160	0.740	Open Manhole	900 x 675
8.001	3 \=/	150	ASW41	19.100	18.080	0.870	Open Manhole	1200
8.002	o	150	ASW42	19.098	17.990	0.958	Open Manhole	900 x 675
8.003	o	150	ASW43	19.002	17.710	1.142	Open Manhole	1200
1.023	o	225	ASW44	19.189	17.367	1.597	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)
1.014	22.881	16.3	ASW32	21.166	18.644	2.072	Open Manhole	1500
1.015	21.744	324.5	ASW33	20.550	18.565	1.460	Open Manhole	1240 x 975
1.016	16.171	141.9	ASW34	20.300	18.451	1.324	Open Manhole	1240 x 975
1.017	25.238	227.4	ASW35	20.300	18.340	1.435	Open Manhole	1500
1.018	3.602	10.0	ASW36	20.300	17.980	1.795	Open Manhole	1500
1.019	13.633	154.9	ASW37 HYDRO	20.300	17.892	1.883	Open Manhole	1200
1.020	55.297	166.6	ASW38	19.319	17.560	1.534	Open Manhole	1200
1.021	11.391	167.5	ASW39	19.150	17.492	1.433	Open Manhole	1200
1.022	20.832	166.7	ASW44	19.189	17.367	1.597	Open Manhole	1200
8.000	8.345	104.3	ASW41	19.100	18.080	0.870	Open Manhole	1200
8.001	6.056	67.3	ASW42	19.098	17.990	0.958	Open Manhole	900 x 675
8.002	3.981	14.2	ASW43	19.002	17.710	1.142	Open Manhole	1200
8.003	7.138	26.6	ASW44	19.189	17.442	1.597	Open Manhole	1200
1.023	5.872	167.8	ASW45 HW6	18.730	17.332	1.173	Open Manhole	0

Free Flowing Outfall Details for Surface Network 3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.023	ASW45 HW6	18.730	17.332	0.000	0	0

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Simulation Criteria for Surface Network 3

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	6
Number of Online Controls	3	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)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.500	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Surface Network 3

Hydro-Brake® Optimum Manhole: ASW17 HYDRO, DS/PN: 1.011, Volume (m³): 10.3

Unit Reference MD-SHE-0129-1100-2600-1100
Design Head (m) 2.600
Design Flow (l/s) 11.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 129
Invert Level (m) 24.500
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1500


Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.600	11.0
Flush-Flo™	0.559	9.5
Kick-Flo®	1.153	7.5
Mean Flow over Head Range	-	8.9

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	4.6	1.200	7.6	3.000	11.8	7.000	17.6
0.200	8.0	1.400	8.2	3.500	12.7	7.500	18.2
0.300	8.9	1.600	8.7	4.000	13.5	8.000	18.8
0.400	9.3	1.800	9.2	4.500	14.3	8.500	19.3
0.500	9.5	2.000	9.7	5.000	15.0	9.000	19.9
0.600	9.5	2.200	10.2	5.500	15.7	9.500	20.4
0.800	9.3	2.400	10.6	6.000	16.4		
1.000	8.6	2.600	11.0	6.500	17.0		

Hydro-Brake® Optimum Manhole: ASW37 HYDRO, DS/PN: 1.020, Volume (m³): 5.4

Unit Reference MD-SHE-0156-1400-1900-1400
Design Head (m) 1.900
Design Flow (l/s) 14.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 156
Invert Level (m) 17.892
Minimum Outlet Pipe Diameter (mm) 225
Suggested Manhole Diameter (mm) 1500

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Hydro-Brake® Optimum Manhole: ASW37 HYDRO, DS/PN: 1.020, Volume (m³): 5.4


Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.900	14.0
Flush-Flo™	0.554	14.0
Kick-Flo®	1.161	11.1
Mean Flow over Head Range	-	12.2

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	5.6	1.200	11.3	3.000	17.4	7.000	26.1
0.200	11.9	1.400	12.1	3.500	18.7	7.500	27.0
0.300	13.1	1.600	12.9	4.000	19.9	8.000	27.8
0.400	13.7	1.800	13.6	4.500	21.1	8.500	28.6
0.500	14.0	2.000	14.3	5.000	22.2	9.000	29.4
0.600	14.0	2.200	15.0	5.500	23.2	9.500	30.2
0.800	13.6	2.400	15.6	6.000	24.2		
1.000	12.7	2.600	16.2	6.500	25.2		

Orifice Manhole: ASW43, DS/PN: 8.003, Volume (m³): 1.5

Diameter (m) 0.031 Discharge Coefficient 0.600 Invert Level (m) 17.710

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Storage Structures for Surface Network 3

Cellular Storage Manhole: ASW7, DS/PN: 3.000

Invert Level (m) 28.350 Safety Factor 3.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	70.0	0.0	0.801	0.0	0.0
0.800	70.0	0.0			

Cellular Storage Manhole: ASW13, DS/PN: 1.007

Invert Level (m) 28.110 Safety Factor 5.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	75.0	0.0	1.601	0.0	0.0
1.600	75.0	0.0			

Cellular Storage Manhole: ASW17 HYDRO, DS/PN: 1.011

Invert Level (m) 24.600 Safety Factor 5.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	500.0	0.0	2.401	0.0	0.0
2.400	500.0	0.0			


Cellular Storage Manhole: ASW24, DS/PN: 6.003

Invert Level (m) 21.530 Safety Factor 3.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	65.0	0.0	0.801	0.0	0.0
0.800	65.0	0.0			

Cellular Storage Manhole: ASW32, DS/PN: 1.015

Invert Level (m) 18.632 Safety Factor 3.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

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Cellular Storage Manhole: ASW32, DS/PN: 1.015

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	45.0	0.0	0.801	0.0	0.0
0.800	45.0	0.0			

Tank or Pond Manhole: ASW37 HYDRO, DS/PN: 1.020

Invert Level (m) 18.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	189.8	0.700	329.6	1.300	579.6	2.000	809.2
0.100	207.3	0.800	353.6	1.500	642.3	2.100	844.2
0.200	225.4	0.900	377.6	1.600	674.0	2.200	879.8
0.300	244.3	1.000	402.3	1.700	706.3	2.299	915.6
0.500	286.1	1.100	521.0	1.800	740.8	2.300	915.9
0.600	307.5	1.200	550.0	1.900	774.7		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 3

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 6
Number of Online Controls 3 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) 0.750
M5-60 (mm) 26.500 Cv (Winter) 0.840

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, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	ASW1	15 Winter	1	+0%	100/15 Summer			
2.000	ASW2	15 Winter	1	+0%	100/15 Summer			
1.001	ASW3	15 Winter	1	+0%	100/15 Summer			
1.002	ASW4	15 Winter	1	+0%	100/15 Summer			
1.003	ASW5	15 Winter	1	+0%				
1.004	ASW6	15 Winter	1	+0%	100/15 Summer			
3.000	ASW7	15 Winter	1	+0%	30/15 Summer			
1.005	ASW8	15 Winter	1	+0%	30/15 Summer			
1.006	ASW9	15 Winter	1	+0%	30/15 Summer			
4.000	ASW10	15 Winter	1	+0%				
4.001	ASW11	15 Winter	1	+0%				
4.002	ASW12	15 Winter	1	+0%				
1.007	ASW13	15 Winter	1	+0%	30/15 Summer			
1.008	ASW14	15 Winter	1	+0%	30/15 Summer			
1.009	ASW15	15 Winter	1	+0%				
1.010	ASW16	15 Winter	1	+0%	100/60 Winter			
1.011	ASW17 HYDRO	240 Winter	1	+0%	1/15 Summer			
5.000	ASW18	15 Winter	1	+0%	30/15 Summer			
1.012	ASW19	15 Winter	1	+0%	100/15 Summer			

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Micro Drainage		Network 2019.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 3


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	ASW1	33.255	-0.160	0.000	0.18	10.9	OK	
2.000	ASW2	33.713	-0.152	0.000	0.23	24.0	OK	
1.001	ASW3	32.752	-0.188	0.000	0.29	38.2	OK	
1.002	ASW4	32.486	-0.184	0.000	0.31	44.3	OK	
1.003	ASW5	32.058	-0.257	0.000	0.21	69.3	OK	
1.004	ASW6	30.587	-0.278	0.000	0.15	78.4	OK	
3.000	ASW7	28.489	-0.286	0.000	0.14	28.4	OK	
1.005	ASW8	28.473	-0.233	0.000	0.50	98.4	OK	
1.006	ASW9	28.417	-0.223	0.000	0.47	102.7	OK	
4.000	ASW10	36.947	-0.178	0.000	0.10	14.1	OK	
4.001	ASW11	33.371	-0.219	0.000	0.16	34.5	OK	
4.002	ASW12	31.689	-0.271	0.000	0.17	61.3	OK	
1.007	ASW13	28.362	-0.173	0.000	0.74	146.2	OK	
1.008	ASW14	28.282	-0.188	0.000	0.74	147.8	OK	
1.009	ASW15	28.021	-0.394	0.000	0.14	149.2	OK	
1.010	ASW16	26.180	-0.385	0.000	0.16	152.0	OK	
1.011	ASW17 HYDRO	25.050	0.250	0.000	0.04	9.5	SURCHARGED	
5.000	ASW18	23.451	-0.143	0.000	0.52	38.0	OK	
1.012	ASW19	23.215	-0.175	0.000	0.36	44.0	OK	

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Micro Drainage		Network 2019.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 3


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.013	ASW20	15 Winter	1	+0%	100/15 Winter			
6.000	ASW21	15 Winter	1	+0%	100/15 Summer			
6.001	ASW22	15 Winter	1	+0%	100/15 Summer			
6.002	ASW23	15 Winter	1	+0%				
6.003	ASW24	15 Winter	1	+0%	100/15 Summer			
6.004	ASW25	15 Winter	1	+0%	30/15 Summer			
7.000	ASW26	15 Winter	1	+0%	30/15 Summer			
7.001	ASW27	15 Winter	1	+0%	30/15 Summer			
6.005	ASW28	15 Winter	1	+0%	30/15 Summer			
6.006	ASW29	15 Winter	1	+0%	30/15 Summer			
6.007	8	15 Winter	1	+0%	30/15 Summer			
1.014	ASW31	15 Winter	1	+0%	100/15 Summer			
1.015	ASW32	15 Winter	1	+0%	30/15 Summer			
1.016	ASW33	15 Winter	1	+0%	30/15 Summer			
1.017	ASW34	15 Winter	1	+0%	30/15 Summer			
1.018	ASW35	240 Winter	1	+0%	30/30 Summer			
1.019	ASW36	240 Winter	1	+0%	1/30 Winter			
1.020	ASW37 HYDRO	360 Winter	1	+0%	1/15 Summer			
1.021	ASW38	1440 Summer	1	+0%				
1.022	ASW39	1440 Summer	1	+0%				
8.000	ASW40	30 Winter	1	+0%	30/15 Summer			
8.001	ASW41	30 Winter	1	+0%				
8.002	ASW42	30 Winter	1	+0%	1/15 Summer			
8.003	ASW43	30 Winter	1	+0%	1/15 Summer			
1.023	ASW44	30 Winter	1	+0%				

PN	US/MH Name	Water Surcharged Flooded			Flow / Cap.	Pipe Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)					
1.013	ASW20	22.698	-0.202	0.000	0.23		64.3	OK	
6.000	ASW21	26.012	-0.228	0.000	0.13		17.3	OK	
6.001	ASW22	25.660	-0.190	0.000	0.28		42.3	OK	
6.002	ASW23	24.432	-0.208	0.000	0.20		60.2	OK	
6.003	ASW24	21.544	-0.186	0.000	0.31		58.0	OK	
6.004	ASW25	20.947	-0.173	0.000	0.38		58.0	OK	
7.000	ASW26	20.665	-0.211	0.000	0.19		12.7	OK	
7.001	ASW27	20.615	-0.189	0.000	0.29		17.1	OK	
6.005	ASW28	20.524	-0.219	0.000	0.52		83.3	OK	
6.006	ASW29	20.427	-0.208	0.000	0.55		82.1	OK	
6.007	8	20.365	-0.204	0.000	0.58		87.6	OK	
1.014	ASW31	20.191	-0.305	0.000	0.23		150.6	OK	
1.015	ASW32	18.953	-0.204	0.000	0.69		145.7	OK	
1.016	ASW33	18.854	-0.236	0.000	0.59		152.0	OK	
1.017	ASW34	18.743	-0.233	0.000	0.59		151.3	OK	
1.018	ASW35	18.659	-0.206	0.000	0.11		48.4	OK	
1.019	ASW36	18.655	0.150	0.000	0.19		48.0	SURCHARGED	

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Micro Drainage	Network 2019.1	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 3

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.020	ASW37 HYDRO	18.638	0.521	0.000	0.36	13.9	SURCHARGED	
1.021	ASW38	17.660	-0.125	0.000	0.41	13.9	OK	
1.022	ASW39	17.588	-0.129	0.000	0.38	13.9	OK	
8.000	ASW40	18.307	-0.003	0.000	0.32	4.9	OK	
8.001	ASW41	18.302	-0.798	0.000	0.00	4.2	OK	
8.002	ASW42	18.302	0.162	0.000	0.08	2.6	SURCHARGED	
8.003	ASW43	18.299	0.439	0.000	0.05	1.5	SURCHARGED	
1.023	ASW44	17.482	-0.110	0.000	0.52	15.4	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 3

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 6
Number of Online Controls 3 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) 0.750
M5-60 (mm) 26.500 Cv (Winter) 0.840

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, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	ASW1	15 Winter	30	+0%	100/15 Summer			
2.000	ASW2	15 Winter	30	+0%	100/15 Summer			
1.001	ASW3	15 Winter	30	+0%	100/15 Summer			
1.002	ASW4	15 Winter	30	+0%	100/15 Summer			
1.003	ASW5	15 Winter	30	+0%				
1.004	ASW6	15 Winter	30	+0%	100/15 Summer			
3.000	ASW7	15 Winter	30	+0%	30/15 Summer			
1.005	ASW8	15 Winter	30	+0%	30/15 Summer			
1.006	ASW9	15 Winter	30	+0%	30/15 Summer			
4.000	ASW10	15 Winter	30	+0%				
4.001	ASW11	15 Winter	30	+0%				
4.002	ASW12	15 Winter	30	+0%				
1.007	ASW13	15 Winter	30	+0%	30/15 Summer			
1.008	ASW14	15 Winter	30	+0%	30/15 Summer			
1.009	ASW15	15 Winter	30	+0%				
1.010	ASW16	15 Winter	30	+0%	100/60 Winter			
1.011	ASW17 HYDRO	360 Winter	30	+0%	1/15 Summer			
5.000	ASW18	15 Winter	30	+0%	30/15 Summer			
1.012	ASW19	15 Winter	30	+0%	100/15 Summer			

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Micro Drainage		Network 2019.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	ASW1	33.296	-0.119	0.000	0.44		26.8	OK	
2.000	ASW2	33.761	-0.104	0.000	0.56		58.8	OK	
1.001	ASW3	32.836	-0.104	0.000	0.74		95.9	OK	
1.002	ASW4	32.578	-0.092	0.000	0.79		112.5	OK	
1.003	ASW5	32.148	-0.167	0.000	0.58		188.5	OK	
1.004	ASW6	30.659	-0.206	0.000	0.41		214.9	OK	
3.000	ASW7	28.958	0.183	0.000	0.29		58.1	SURCHARGED	
1.005	ASW8	28.948	0.242	0.000	1.01		199.0	SURCHARGED	
1.006	ASW9	28.881	0.241	0.000	0.98		213.7	SURCHARGED	
4.000	ASW10	36.974	-0.151	0.000	0.23		34.5	OK	
4.001	ASW11	33.432	-0.158	0.000	0.45		97.6	OK	
4.002	ASW12	31.773	-0.187	0.000	0.50		180.9	OK	
1.007	ASW13	28.786	0.251	0.000	1.72		338.7	SURCHARGED	
1.008	ASW14	28.588	0.118	0.000	1.70		340.9	SURCHARGED	
1.009	ASW15	28.098	-0.317	0.000	0.33		343.4	OK	
1.010	ASW16	26.261	-0.304	0.000	0.37		349.5	OK	
1.011	ASW17 HYDRO	25.837	1.037	0.000	0.04		9.5	SURCHARGED	
5.000	ASW18	23.729	0.135	0.000	1.27		92.9	SURCHARGED	
1.012	ASW19	23.300	-0.090	0.000	0.82		99.5	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 3


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.013	ASW20	15 Winter	30	+0%	100/15 Winter			
6.000	ASW21	15 Winter	30	+0%	100/15 Summer			
6.001	ASW22	15 Winter	30	+0%	100/15 Summer			
6.002	ASW23	15 Winter	30	+0%				
6.003	ASW24	15 Winter	30	+0%	100/15 Summer			
6.004	ASW25	15 Winter	30	+0%	30/15 Summer			
7.000	ASW26	15 Winter	30	+0%	30/15 Summer			
7.001	ASW27	15 Winter	30	+0%	30/15 Summer			
6.005	ASW28	15 Winter	30	+0%	30/15 Summer			
6.006	ASW29	15 Winter	30	+0%	30/15 Summer			
6.007	8	15 Winter	30	+0%	30/15 Summer			
1.014	ASW31	15 Winter	30	+0%	100/15 Summer			
1.015	ASW32	240 Winter	30	+0%	30/15 Summer			
1.016	ASW33	240 Winter	30	+0%	30/15 Summer			
1.017	ASW34	240 Winter	30	+0%	30/15 Summer			
1.018	ASW35	240 Winter	30	+0%	30/30 Summer			
1.019	ASW36	360 Winter	30	+0%	1/30 Winter			
1.020	ASW37 HYDRO	480 Winter	30	+0%	1/15 Summer			
1.021	ASW38	1440 Winter	30	+0%				
1.022	ASW39	1440 Winter	30	+0%				
8.000	ASW40	60 Winter	30	+0%	30/15 Summer			
8.001	ASW41	60 Winter	30	+0%				
8.002	ASW42	60 Winter	30	+0%	1/15 Summer			
8.003	ASW43	60 Winter	30	+0%	1/15 Summer			
1.023	ASW44	30 Winter	30	+0%				

PN	US/MH Name	Water Surcharged Flooded			Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)					
1.013	ASW20	22.763	-0.137	0.000	0.55		154.6	OK	
6.000	ASW21	26.057	-0.183	0.000	0.32		42.3	OK	
6.001	ASW22	25.755	-0.095	0.000	0.79		118.2	OK	
6.002	ASW23	24.507	-0.133	0.000	0.58		172.7	OK	
6.003	ASW24	21.661	-0.069	0.000	0.81		152.0	OK	
6.004	ASW25	21.289	0.169	0.000	0.97		149.0	SURCHARGED	
7.000	ASW26	21.119	0.243	0.000	0.39		26.0	SURCHARGED	
7.001	ASW27	21.030	0.226	0.000	0.61		35.9	SURCHARGED	
6.005	ASW28	20.948	0.205	0.000	1.28		206.8	SURCHARGED	
6.006	ASW29	20.764	0.129	0.000	1.37		205.7	SURCHARGED	
6.007	8	20.629	0.060	0.000	1.43		217.6	SURCHARGED	
1.014	ASW31	20.290	-0.206	0.000	0.56		371.9	OK	
1.015	ASW32	19.539	0.382	0.000	0.40		84.6	SURCHARGED	
1.016	ASW33	19.525	0.435	0.000	0.34		88.7	SURCHARGED	
1.017	ASW34	19.410	0.434	0.000	0.34		88.2	SURCHARGED	
1.018	ASW35	19.297	0.432	0.000	0.19		87.3	SURCHARGED	
1.019	ASW36	19.240	0.735	0.000	0.26		64.0	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Surface Network 3

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.020	ASW37 HYDRO	19.226	1.109	0.000	0.36	13.9	SURCHARGED	
1.021	ASW38	17.660	-0.125	0.000	0.41	13.9	OK	
1.022	ASW39	17.588	-0.129	0.000	0.38	13.9	OK	
8.000	ASW40	18.616	0.306	0.000	0.49	7.5	FLOOD RISK	
8.001	ASW41	18.609	-0.491	0.000	0.00	7.0	OK	
8.002	ASW42	18.610	0.470	0.000	0.07	2.2	SURCHARGED	
8.003	ASW43	18.606	0.746	0.000	0.06	1.9	FLOOD RISK	
1.023	ASW44	17.483	-0.109	0.000	0.53	15.8	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 6
Number of Online Controls 3 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) 0.750
M5-60 (mm) 26.500 Cv (Winter) 0.840

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, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	ASW1	15 Winter	100	+40%	100/15	Summer		
2.000	ASW2	15 Winter	100	+40%	100/15	Summer		
1.001	ASW3	15 Winter	100	+40%	100/15	Summer		
1.002	ASW4	15 Winter	100	+40%	100/15	Summer		
1.003	ASW5	15 Winter	100	+40%				
1.004	ASW6	15 Winter	100	+40%	100/15	Summer		
3.000	ASW7	15 Winter	100	+40%	30/15	Summer		
1.005	ASW8	15 Winter	100	+40%	30/15	Summer		
1.006	ASW9	15 Winter	100	+40%	30/15	Summer		
4.000	ASW10	15 Winter	100	+40%				
4.001	ASW11	15 Winter	100	+40%				
4.002	ASW12	15 Winter	100	+40%				
1.007	ASW13	15 Winter	100	+40%	30/15	Summer		
1.008	ASW14	15 Winter	100	+40%	30/15	Summer		
1.009	ASW15	480 Winter	100	+40%				
1.010	ASW16	480 Winter	100	+40%	100/60	Winter		
1.011	ASW17	HYDRO 480 Winter	100	+40%	1/15	Summer		
5.000	ASW18	15 Winter	100	+40%	30/15	Summer		
1.012	ASW19	15 Winter	100	+40%	100/15	Summer		

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Micro Drainage	Network 2019.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	ASW1	33.654	0.239	0.000	0.75	45.8	SURCHARGED	
2.000	ASW2	34.221	0.356	0.000	0.95	100.4	SURCHARGED	
1.001	ASW3	33.377	0.437	0.000	1.26	163.5	SURCHARGED	
1.002	ASW4	32.947	0.277	0.000	1.33	188.1	SURCHARGED	
1.003	ASW5	32.291	-0.024	0.000	0.97	316.9	OK	
1.004	ASW6	31.269	0.404	0.000	0.69	359.0	SURCHARGED	
3.000	ASW7	30.606	1.831	0.000	0.71	141.4	FLOOD RISK	
1.005	ASW8	30.565	1.859	0.000	2.47	487.9	SURCHARGED	
1.006	ASW9	30.179	1.539	0.000	2.31	503.7	SURCHARGED	
4.000	ASW10	37.003	-0.122	0.000	0.43	63.3	OK	
4.001	ASW11	33.501	-0.089	0.000	0.83	179.0	OK	
4.002	ASW12	31.867	-0.093	0.000	0.91	331.7	OK	
1.007	ASW13	29.689	1.154	0.000	3.13	615.9	SURCHARGED	
1.008	ASW14	29.046	0.576	0.000	3.09	619.4	SURCHARGED	
1.009	ASW15	28.199	-0.216	0.000	0.11	115.9	OK	
1.010	ASW16	28.196	1.631	0.000	0.12	118.9	SURCHARGED	
1.011	ASW17 HYDRO	28.192	3.392	0.000	0.05	13.0	FLOOD RISK	
5.000	ASW18	24.808	1.214	0.000	2.17	158.0	SURCHARGED	
1.012	ASW19	23.879	0.489	0.000	1.33	161.4	SURCHARGED	

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Micro Drainage		Network 2019.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.013	ASW20	15 Winter	100	+40%	100/15 Winter			
6.000	ASW21	15 Winter	100	+40%	100/15 Summer			
6.001	ASW22	15 Winter	100	+40%	100/15 Summer			
6.002	ASW23	15 Winter	100	+40%				
6.003	ASW24	15 Winter	100	+40%	100/15 Summer			
6.004	ASW25	15 Winter	100	+40%	30/15 Summer			
7.000	ASW26	15 Winter	100	+40%	30/15 Summer			
7.001	ASW27	15 Winter	100	+40%	30/15 Summer			
6.005	ASW28	15 Winter	100	+40%	30/15 Summer			
6.006	ASW29	15 Winter	100	+40%	30/15 Summer			
6.007	8	15 Winter	100	+40%	30/15 Summer			
1.014	ASW31	15 Winter	100	+40%	100/15 Summer			
1.015	ASW32	15 Winter	100	+40%	30/15 Summer			
1.016	ASW33	15 Winter	100	+40%	30/15 Summer			
1.017	ASW34	360 Winter	100	+40%	30/15 Summer			
1.018	ASW35	360 Winter	100	+40%	30/30 Summer			
1.019	ASW36	360 Winter	100	+40%	1/30 Winter			
1.020	ASW37 HYDRO	960 Winter	100	+40%	1/15 Summer			
1.021	ASW38	960 Winter	100	+40%				
1.022	ASW39	960 Winter	100	+40%				
8.000	ASW40	60 Winter	100	+40%	30/15 Summer			
8.001	ASW41	60 Winter	100	+40%				
8.002	ASW42	60 Winter	100	+40%	1/15 Summer			
8.003	ASW43	60 Winter	100	+40%	1/15 Summer			
1.023	ASW44	30 Winter	100	+40%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.013	ASW20	23.034	0.134	0.000	0.88	244.8	SURCHARGED	
6.000	ASW21	26.874	0.634	0.000	0.56	74.2	SURCHARGED	
6.001	ASW22	26.710	0.860	0.000	1.29	193.3	SURCHARGED	
6.002	ASW23	24.603	-0.037	0.000	0.95	280.5	OK	
6.003	ASW24	22.723	0.993	0.000	0.97	181.0	SURCHARGED	
6.004	ASW25	22.143	1.023	0.000	1.15	177.4	SURCHARGED	
7.000	ASW26	21.970	1.094	0.000	0.79	52.6	FLOOD RISK	
7.001	ASW27	21.917	1.113	0.000	1.22	72.1	SURCHARGED	
6.005	ASW28	21.845	1.102	0.000	1.58	255.4	SURCHARGED	
6.006	ASW29	21.687	1.052	0.000	1.63	244.5	SURCHARGED	
6.007	8	21.563	0.994	0.000	1.79	272.6	SURCHARGED	
1.014	ASW31	21.384	0.888	0.000	0.77	511.6	SURCHARGED	
1.015	ASW32	20.636	1.479	0.000	2.31	489.8	SURCHARGED	
1.016	ASW33	20.242	1.152	0.000	2.02	522.7	FLOOD RISK	
1.017	ASW34	20.070	1.094	0.000	0.46	116.3	FLOOD RISK	
1.018	ASW35	19.957	1.092	0.000	0.25	116.0	FLOOD RISK	
1.019	ASW36	19.921	1.416	0.000	0.47	115.7	FLOOD RISK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.020	ASW37 HYDRO	19.911	1.794	0.000	0.37	14.4	FLOOD RISK	
1.021	ASW38	17.662	-0.123	0.000	0.42	14.4	OK	
1.022	ASW39	17.590	-0.127	0.000	0.39	14.4	OK	
8.000	ASW40	18.957	0.647	0.000	0.92	14.0	FLOOD RISK	
8.001	ASW41	18.949	-0.151	0.000	0.00	13.3	FLOOD RISK	
8.002	ASW42	18.949	0.809	0.000	0.08	2.6	FLOOD RISK	
8.003	ASW43	18.945	1.085	0.000	0.07	2.2	FLOOD RISK	
1.023	ASW44	17.484	-0.108	0.000	0.53	15.9	OK	