

Ardent Consulting Engineers		Page 1
Third Floor, The Hallmark Building 52-56 Leadenhall Street London, EC3M5JE	Woodcroft Lane, Lovedean Surface Water Network 1	
Date 10/08/2020 10:22 File 192931 Lovedean.MDX	Designed by JH Checked by DP	
Innovyze	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW Network

Pipe Sizes ACE-PIPE Manhole Sizes ACE-MH

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.300	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for SW Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	20.334	0.070	290.5	0.050	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.001	20.169	0.070	288.1	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	9.000	0.270	33.3	0.120	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	18.812	0.065	289.4	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	18.121	0.060	300.0	0.060	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	15.030	1.165	12.9	0.040	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	16.813	1.300	12.9	0.020	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	20.664	0.350	59.0	0.020	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	25.234	1.005	25.1	0.020	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.006	41.484	1.600	25.9	0.040	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	11.929	0.415	28.7	0.050	5.00	0.0	0.600	o	300	Pipe/Conduit	
S4.001	14.148	0.475	29.8	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.37	60.230	0.050	0.0	0.0	0.0	0.92	64.8	6.8
S1.001	50.00	5.73	60.160	0.100	0.0	0.0	0.0	0.92	65.1	13.5
S2.000	50.00	5.05	60.360	0.120	0.0	0.0	0.0	2.73	193.2	16.2
S1.002	50.00	6.08	60.090	0.250	0.0	0.0	0.0	0.92	65.0	33.9
S1.003	50.00	6.41	60.025	0.310	0.0	0.0	0.0	0.90	63.8	42.0
S3.000	50.00	5.07	62.505	0.040	0.0	0.0	0.0	3.66	145.6	5.4
S3.001	50.00	5.14	61.340	0.060	0.0	0.0	0.0	3.66	145.5	8.1
S1.004	50.00	6.58	59.965	0.390	0.0	0.0	0.0	2.05	144.9	52.8
S1.005	50.00	6.71	59.615	0.410	0.0	0.0	0.0	3.15	222.7	55.5
S1.006	50.00	6.93	58.610	0.450	0.0	0.0	0.0	3.10	219.1	60.9
S4.000	50.00	5.07	57.900	0.050	0.0	0.0	0.0	2.94	208.1	6.8
S4.001	50.00	5.15	57.485	0.080	0.0	0.0	0.0	2.89	204.5	10.8

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Network Design Table for SW Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.007	22.203	0.075	296.0	0.090	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.008	25.572	0.070	365.3	0.040	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.000	18.863	0.310	60.8	0.070	5.00	0.0	0.600	o	375	Pipe/Conduit	
S6.000	9.000	0.150	60.0	0.120	5.00	0.0	0.600	o	375	Pipe/Conduit	
S5.001	9.853	0.165	59.7	0.020	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.002	10.991	0.185	59.4	0.020	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.003	10.833	0.180	60.2	0.010	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.004	12.329	0.205	60.1	0.020	0.00	0.0	0.600	o	375	Pipe/Conduit	
S7.000	12.686	0.405	31.3	0.080	5.00	0.0	0.600	o	300	Pipe/Conduit	
S7.001	10.237	0.340	30.1	0.020	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.002	16.051	0.535	30.0	0.020	0.00	0.0	0.600	o	300	Pipe/Conduit	
S8.000	24.473	0.070	349.6	0.100	5.00	0.0	0.600	o	375	Pipe/Conduit	
S8.001	11.544	0.035	329.8	0.020	0.00	0.0	0.600	o	375	Pipe/Conduit	
S7.003	18.491	0.050	369.8	0.020	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.005	7.876	0.165	47.7	0.020	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.006	20.055	0.425	47.2	0.020	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.007	23.908	1.015	23.6	0.040	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.009	28.210	0.070	403.0	0.090	0.00	0.0	0.600	o	525	Pipe/Conduit	
S9.000	21.612	0.205	105.4	0.090	5.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.007	50.00	7.29	56.935	0.620	0.0	0.0	0.0	1.05	115.7	84.0
S1.008	50.00	7.74	56.860	0.660	0.0	0.0	0.0	0.94	104.0	89.4
S5.000	50.00	5.14	58.940	0.070	0.0	0.0	0.0	2.33	256.9	9.5
S6.000	50.00	5.06	58.780	0.120	0.0	0.0	0.0	2.34	258.8	16.2
S5.001	50.00	5.21	58.630	0.210	0.0	0.0	0.0	2.35	259.4	28.4
S5.002	50.00	5.28	58.465	0.230	0.0	0.0	0.0	2.35	260.1	31.1
S5.003	50.00	5.36	58.280	0.240	0.0	0.0	0.0	2.34	258.4	32.5
S5.004	50.00	5.45	58.100	0.260	0.0	0.0	0.0	2.34	258.5	35.2
S7.000	50.00	5.07	59.300	0.080	0.0	0.0	0.0	2.82	199.3	10.8
S7.001	50.00	5.13	58.895	0.100	0.0	0.0	0.0	2.88	203.3	13.5
S7.002	50.00	5.23	58.555	0.120	0.0	0.0	0.0	2.88	203.6	16.2
S8.000	50.00	5.42	58.050	0.100	0.0	0.0	0.0	0.96	106.4	13.5
S8.001	50.00	5.62	57.980	0.120	0.0	0.0	0.0	0.99	109.6	16.2
S7.003	50.00	5.95	57.945	0.260	0.0	0.0	0.0	0.94	103.4	35.2
S5.005	50.00	6.00	57.895	0.540	0.0	0.0	0.0	2.63	290.3	73.1
S5.006	50.00	6.12	57.730	0.560	0.0	0.0	0.0	2.64	292.0	75.8
S5.007	50.00	6.23	57.305	0.600	0.0	0.0	0.0	3.75	413.8	81.2
S1.009	50.00	8.16	56.140	1.350	0.0	0.0	0.0	1.11	240.2	182.8
S9.000	50.00	5.28	56.575	0.090	0.0	0.0	0.0	1.27	50.6	12.2

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Network Design Table for SW Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.010	37.670	0.075	502.3	0.050	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.011	35.281	0.070	504.0	0.080	0.00	0.0	0.600	o	525	Pipe/Conduit	
S10.000	9.043	0.045	201.0	0.070	5.00	0.0	0.600	o	225	Pipe/Conduit	
S10.001	8.593	0.040	214.8	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.002	11.066	0.050	221.3	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
S11.000	8.174	0.155	52.7	0.040	5.00	0.0	0.600	o	225	Pipe/Conduit	
S11.001	11.232	0.210	53.5	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.003	12.207	0.410	29.8	0.010	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.004	5.729	0.175	32.7	0.020	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.012	24.390	1.010	24.1	0.030	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.013	11.599	0.470	24.7	0.070	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)
S1.010	49.03	8.80	56.070	1.490	0.0	0.0	0.0	0.99	214.9	197.8
S1.011	47.44	9.39	55.995	1.570	0.0	0.0	0.0	0.99	214.5	201.7
S10.000	50.00	5.16	56.945	0.070	0.0	0.0	0.0	0.92	36.5	9.5
S10.001	50.00	5.33	56.900	0.080	0.0	0.0	0.0	0.89	35.3	10.8
S10.002	50.00	5.54	56.860	0.090	0.0	0.0	0.0	0.87	34.8	12.2
S11.000	50.00	5.08	57.175	0.040	0.0	0.0	0.0	1.81	71.8	5.4
S11.001	50.00	5.18	57.020	0.050	0.0	0.0	0.0	1.79	71.3	6.8
S10.003	50.00	5.62	56.810	0.150	0.0	0.0	0.0	2.41	95.7	20.3
S10.004	50.00	5.66	56.400	0.170	0.0	0.0	0.0	2.29	91.2	23.0
S1.012	47.21	9.48	55.925	1.770	0.0	0.0	0.0	4.57	989.7	226.3
S1.013	47.11	9.52	54.915	1.840	0.0	0.0	0.0	4.52	979.0	234.7

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Manhole Schedules for SW Network

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)	Pipes In Diameter (mm)	Backdrop (mm)
S1	61.730	1.500	Open Manhole	1200	S1.000	60.230	300				
S2	61.510	1.350	Open Manhole	1200	S1.001	60.160	300	S1.000	60.160	300	
S3	61.860	1.500	Open Manhole	1200	S2.000	60.360	300				
S4	61.710	1.620	Open Manhole	1200	S1.002	60.090	300	S1.001	60.090	300	
								S2.000	60.090	300	
S5	62.190	2.165	Open Manhole	1200	S1.003	60.025	300	S1.002	60.025	300	
S6	63.930	1.425	Open Manhole	1200	S3.000	62.505	225				
S7	63.370	2.030	Open Manhole	1200	S3.001	61.340	225	S3.000	61.340	225	
S8	62.810	2.845	Open Manhole	1200	S1.004	59.965	300	S1.003	59.965	300	
								S3.001	60.040	225	
S9	61.960	2.345	Open Manhole	1200	S1.005	59.615	300	S1.004	59.615	300	
S10	60.990	2.380	Open Manhole	1200	S1.006	58.610	300	S1.005	58.610	300	
S11	59.400	1.500	Open Manhole	1200	S4.000	57.900	300				
S12	59.390	1.905	Open Manhole	1200	S4.001	57.485	300	S4.000	57.485	300	
S13	59.390	2.455	Open Manhole	1500	S1.007	56.935	375	S1.006	57.010	300	
								S4.001	57.010	300	
S14	58.835	1.975	Open Manhole	1500	S1.008	56.860	375	S1.007	56.860	375	
S15	60.260	1.320	Open Manhole	1500	S5.000	58.940	375				
S16	60.090	1.310	Open Manhole	1500	S6.000	58.780	375				
S17	59.920	1.290	Open Manhole	1500	S5.001	58.630	375	S5.000	58.630	375	
								S6.000	58.630	375	
S18	59.800	1.335	Open Manhole	1500	S5.002	58.465	375	S5.001	58.465	375	
S19	59.620	1.340	Open Manhole	1500	S5.003	58.280	375	S5.002	58.280	375	
S20	59.500	1.400	Open Manhole	1500	S5.004	58.100	375	S5.003	58.100	375	
S21	60.800	1.500	Open Manhole	1200	S7.000	59.300	300				
S22	60.470	1.575	Open Manhole	1200	S7.001	58.895	300	S7.000	58.895	300	
S23	60.210	1.655	Open Manhole	1200	S7.002	58.555	300	S7.001	58.555	300	
S24	59.365	1.315	Open Manhole	1500	S8.000	58.050	375				
S25	59.600	1.620	Open Manhole	1500	S8.001	57.980	375	S8.000	57.980	375	
S26	59.715	1.770	Open Manhole	1500	S7.003	57.945	375	S7.002	58.020	300	
								S8.001	57.945	375	
S27	59.470	1.575	Open Manhole	1500	S5.005	57.895	375	S5.004	57.895	375	
								S7.003	57.895	375	
S28	59.300	1.570	Open Manhole	1500	S5.006	57.730	375	S5.005	57.730	375	
S29	59.000	1.695	Open Manhole	1500	S5.007	57.305	375	S5.006	57.305	375	
S30	58.570	2.430	Open Manhole	1500	S1.009	56.140	525	S1.008	56.790	375	500
								S5.007	56.290	375	
S31	58.070	1.495	Open Manhole	1200	S9.000	56.575	225				
S32	58.280	2.210	Open Manhole	1500	S1.010	56.070	525	S1.009	56.070	525	
								S9.000	56.370	225	
S33	57.980	1.985	Open Manhole	1500	S1.011	55.995	525	S1.010	55.995	525	
S34	58.390	1.445	Open Manhole	1200	S10.000	56.945	225				
S35	58.265	1.365	Open Manhole	1200	S10.001	56.900	225	S10.000	56.900	225	
S36	58.220	1.360	Open Manhole	1200	S10.002	56.860	225	S10.001	56.860	225	
S37	58.600	1.425	Open Manhole	1200	S11.000	57.175	225				
S38	58.420	1.400	Open Manhole	1200	S11.001	57.020	225	S11.000	57.020	225	

Manhole Schedules for SW Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S39	58.250	1.440	Open Manhole	1200	S10.003	56.810	225	S10.002	56.810	225	
								S11.001	56.810	225	
S40	57.810	1.410	Open Manhole	1200	S10.004	56.400	225	S10.003	56.400	225	
S41	57.600	1.675	Open Manhole	1500	S1.012	55.925	525	S1.011	55.925	525	
								S10.004	56.225	225	
S42	56.800	1.885	Open Manhole	1500	S1.013	54.915	525	S1.012	54.915	525	
SOutfall	56.500	2.055	Open Manhole	1500		OUTFALL		S1.013	54.445	525	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	468187.829	112140.612	468187.829	112140.612	Required	
S2	468187.071	112120.292	468187.071	112120.292	Required	
S3	468199.498	112102.070	468199.498	112102.070	Required	
S4	468190.647	112100.443	468190.647	112100.443	Required	
S5	468193.982	112081.929	468193.982	112081.929	Required	
S6	468234.230	112068.190	468234.230	112068.190	Required	
S7	468219.418	112070.744	468219.418	112070.744	Required	
S8	468203.196	112066.325	468203.196	112066.325	Required	
S9	468185.688	112055.350	468185.688	112055.350	Required	
S10	468163.598	112043.152	468163.598	112043.152	Required	
S11	468126.350	112009.436	468126.350	112009.436	Required	
S12	468123.069	112020.904	468123.069	112020.904	Required	
S13	468122.913	112035.052	468122.913	112035.052	Required	
S14	468101.045	112038.896	468101.045	112038.896	Required	

Manhole Schedules for SW Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S15	468118.252	112114.349	468118.252	112114.349	Required	
S16	468128.386	112095.565	468128.386	112095.565	Required	
S17	468119.386	112095.520	468119.386	112095.520	Required	
S18	468112.753	112088.235	468112.753	112088.235	Required	
S19	468102.083	112085.594	468102.083	112085.594	Required	
S20	468091.287	112086.476	468091.287	112086.476	Required	
S21	468061.479	112141.960	468061.479	112141.960	Required	
S22	468064.989	112129.769	468064.989	112129.769	Required	
S23	468064.167	112119.565	468064.167	112119.565	Required	
S24	468031.277	112100.101	468031.277	112100.101	Required	
S25	468055.749	112099.887	468055.749	112099.887	Required	
S26	468066.644	112103.706	468066.644	112103.706	Required	
S27	468079.658	112090.570	468079.658	112090.570	Required	
S28	468076.203	112083.491	468076.203	112083.491	Required	
S29	468075.874	112063.439	468075.874	112063.439	Required	
S30	468075.481	112039.534	468075.481	112039.534	Required	
S31	468025.667	112040.395	468025.667	112040.395	Required	
S32	468047.275	112040.018	468047.275	112040.018	Required	
S33	468046.657	112002.354	468046.657	112002.354	Required	

Manhole Schedules for SW Network

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S34	468082.952	111973.302	468082.952	111973.302	Required	
S35	468074.030	111971.827	468074.030	111971.827	Required	
S36	468066.864	111967.085	468066.864	111967.085	Required	
S37	468062.936	111939.154	468062.936	111939.154	Required	
S38	468060.180	111946.849	468060.180	111946.849	Required	
S39	468060.436	111958.078	468060.436	111958.078	Required	
S40	468048.910	111962.097	468048.910	111962.097	Required	
S41	468046.077	111967.077	468046.077	111967.077	Required	
S42	468021.687	111967.077	468021.687	111967.077	Required	
SOutfall	468011.233	111972.102			No Entry	

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PIPELINE SCHEDULES for SW Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	300	S1	61.730	60.230	1.200	Open Manhole	1200
S1.001	o	300	S2	61.510	60.160	1.050	Open Manhole	1200
S2.000	o	300	S3	61.860	60.360	1.200	Open Manhole	1200
S1.002	o	300	S4	61.710	60.090	1.320	Open Manhole	1200
S1.003	o	300	S5	62.190	60.025	1.865	Open Manhole	1200
S3.000	o	225	S6	63.930	62.505	1.200	Open Manhole	1200
S3.001	o	225	S7	63.370	61.340	1.805	Open Manhole	1200
S1.004	o	300	S8	62.810	59.965	2.545	Open Manhole	1200
S1.005	o	300	S9	61.960	59.615	2.045	Open Manhole	1200
S1.006	o	300	S10	60.990	58.610	2.080	Open Manhole	1200
S4.000	o	300	S11	59.400	57.900	1.200	Open Manhole	1200
S4.001	o	300	S12	59.390	57.485	1.605	Open Manhole	1200
S1.007	o	375	S13	59.390	56.935	2.080	Open Manhole	1500
S1.008	o	375	S14	58.835	56.860	1.600	Open Manhole	1500
S5.000	o	375	S15	60.260	58.940	0.945	Open Manhole	1500
S6.000	o	375	S16	60.090	58.780	0.935	Open Manhole	1500
S5.001	o	375	S17	59.920	58.630	0.915	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	20.334	290.5	S2	61.510	60.160	1.050	Open Manhole	1200
S1.001	20.169	288.1	S4	61.710	60.090	1.320	Open Manhole	1200
S2.000	9.000	33.3	S4	61.710	60.090	1.320	Open Manhole	1200
S1.002	18.812	289.4	S5	62.190	60.025	1.865	Open Manhole	1200
S1.003	18.121	300.0	S8	62.810	59.965	2.545	Open Manhole	1200
S3.000	15.030	12.9	S7	63.370	61.340	1.805	Open Manhole	1200
S3.001	16.813	12.9	S8	62.810	60.040	2.545	Open Manhole	1200
S1.004	20.664	59.0	S9	61.960	59.615	2.045	Open Manhole	1200
S1.005	25.234	25.1	S10	60.990	58.610	2.080	Open Manhole	1200
S1.006	41.484	25.9	S13	59.390	57.010	2.080	Open Manhole	1500
S4.000	11.929	28.7	S12	59.390	57.485	1.605	Open Manhole	1200
S4.001	14.148	29.8	S13	59.390	57.010	2.080	Open Manhole	1500
S1.007	22.203	296.0	S14	58.835	56.860	1.600	Open Manhole	1500
S1.008	25.572	365.3	S30	58.570	56.790	1.405	Open Manhole	1500
S5.000	18.863	60.8	S17	59.920	58.630	0.915	Open Manhole	1500
S6.000	9.000	60.0	S17	59.920	58.630	0.915	Open Manhole	1500
S5.001	9.853	59.7	S18	59.800	58.465	0.960	Open Manhole	1500

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PIPELINE SCHEDULES for SW Network

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.002	o	375	S18	59.800	58.465	0.960	Open Manhole	1500
S5.003	o	375	S19	59.620	58.280	0.965	Open Manhole	1500
S5.004	o	375	S20	59.500	58.100	1.025	Open Manhole	1500
S7.000	o	300	S21	60.800	59.300	1.200	Open Manhole	1200
S7.001	o	300	S22	60.470	58.895	1.275	Open Manhole	1200
S7.002	o	300	S23	60.210	58.555	1.355	Open Manhole	1200
S8.000	o	375	S24	59.365	58.050	0.940	Open Manhole	1500
S8.001	o	375	S25	59.600	57.980	1.245	Open Manhole	1500
S7.003	o	375	S26	59.715	57.945	1.395	Open Manhole	1500
S5.005	o	375	S27	59.470	57.895	1.200	Open Manhole	1500
S5.006	o	375	S28	59.300	57.730	1.195	Open Manhole	1500
S5.007	o	375	S29	59.000	57.305	1.320	Open Manhole	1500
S1.009	o	525	S30	58.570	56.140	1.905	Open Manhole	1500
S9.000	o	225	S31	58.070	56.575	1.270	Open Manhole	1200
S1.010	o	525	S32	58.280	56.070	1.685	Open Manhole	1500
S1.011	o	525	S33	57.980	55.995	1.460	Open Manhole	1500
S10.000	o	225	S34	58.390	56.945	1.220	Open Manhole	1200
S10.001	o	225	S35	58.265	56.900	1.140	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)
S5.002	10.991	59.4	S19	59.620	58.280	0.965	Open Manhole	1500
S5.003	10.833	60.2	S20	59.500	58.100	1.025	Open Manhole	1500
S5.004	12.329	60.1	S27	59.470	57.895	1.200	Open Manhole	1500
S7.000	12.686	31.3	S22	60.470	58.895	1.275	Open Manhole	1200
S7.001	10.237	30.1	S23	60.210	58.555	1.355	Open Manhole	1200
S7.002	16.051	30.0	S26	59.715	58.020	1.395	Open Manhole	1500
S8.000	24.473	349.6	S25	59.600	57.980	1.245	Open Manhole	1500
S8.001	11.544	329.8	S26	59.715	57.945	1.395	Open Manhole	1500
S7.003	18.491	369.8	S27	59.470	57.895	1.200	Open Manhole	1500
S5.005	7.876	47.7	S28	59.300	57.730	1.195	Open Manhole	1500
S5.006	20.055	47.2	S29	59.000	57.305	1.320	Open Manhole	1500
S5.007	23.908	23.6	S30	58.570	56.290	1.905	Open Manhole	1500
S1.009	28.210	403.0	S32	58.280	56.070	1.685	Open Manhole	1500
S9.000	21.612	105.4	S32	58.280	56.370	1.685	Open Manhole	1500
S1.010	37.670	502.3	S33	57.980	55.995	1.460	Open Manhole	1500
S1.011	35.281	504.0	S41	57.600	55.925	1.150	Open Manhole	1500
S10.000	9.043	201.0	S35	58.265	56.900	1.140	Open Manhole	1200
S10.001	8.593	214.8	S36	58.220	56.860	1.135	Open Manhole	1200

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PIPELINE SCHEDULES for SW Network

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)
S10.002	o	225	S36	58.220	56.860	1.135	Open Manhole	1200
S11.000	o	225	S37	58.600	57.175	1.200	Open Manhole	1200
S11.001	o	225	S38	58.420	57.020	1.175	Open Manhole	1200
S10.003	o	225	S39	58.250	56.810	1.215	Open Manhole	1200
S10.004	o	225	S40	57.810	56.400	1.185	Open Manhole	1200
S1.012	o	525	S41	57.600	55.925	1.150	Open Manhole	1500
S1.013	o	525	S42	56.800	54.915	1.360	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)
S10.002	11.066	221.3	S39	58.250	56.810	1.215	Open Manhole	1200
S11.000	8.174	52.7	S38	58.420	57.020	1.175	Open Manhole	1200
S11.001	11.232	53.5	S39	58.250	56.810	1.215	Open Manhole	1200
S10.003	12.207	29.8	S40	57.810	56.400	1.185	Open Manhole	1200
S10.004	5.729	32.7	S41	57.600	56.225	1.150	Open Manhole	1500
S1.012	24.390	24.1	S42	56.800	54.915	1.360	Open Manhole	1500
S1.013	11.599	24.7	SOutfall	56.500	54.445	1.530	Open Manhole	1500

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Area Summary for SW Network

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.050	0.050	0.050
1.001	-	-	100	0.050	0.050	0.050
2.000	-	-	100	0.120	0.120	0.120
1.002	-	-	100	0.030	0.030	0.030
1.003	-	-	100	0.060	0.060	0.060
3.000	-	-	100	0.040	0.040	0.040
3.001	-	-	100	0.020	0.020	0.020
1.004	-	-	100	0.020	0.020	0.020
1.005	-	-	100	0.020	0.020	0.020
1.006	-	-	100	0.040	0.040	0.040
4.000	-	-	100	0.050	0.050	0.050
4.001	-	-	100	0.030	0.030	0.030
1.007	-	-	100	0.090	0.090	0.090
1.008	-	-	100	0.040	0.040	0.040
5.000	-	-	100	0.070	0.070	0.070
6.000	-	-	100	0.120	0.120	0.120
5.001	-	-	100	0.020	0.020	0.020
5.002	-	-	100	0.020	0.020	0.020
5.003	-	-	100	0.010	0.010	0.010
5.004	-	-	100	0.020	0.020	0.020
7.000	-	-	100	0.080	0.080	0.080
7.001	-	-	100	0.020	0.020	0.020
7.002	-	-	100	0.020	0.020	0.020
8.000	-	-	100	0.100	0.100	0.100
8.001	-	-	100	0.020	0.020	0.020
7.003	-	-	100	0.020	0.020	0.020
5.005	-	-	100	0.020	0.020	0.020
5.006	-	-	100	0.020	0.020	0.020
5.007	-	-	100	0.040	0.040	0.040
1.009	-	-	100	0.090	0.090	0.090
9.000	-	-	100	0.090	0.090	0.090
1.010	-	-	100	0.050	0.050	0.050
1.011	-	-	100	0.080	0.080	0.080
10.000	-	-	100	0.070	0.070	0.070
10.001	-	-	100	0.010	0.010	0.010
10.002	-	-	100	0.010	0.010	0.010
11.000	-	-	100	0.040	0.040	0.040
11.001	-	-	100	0.010	0.010	0.010
10.003	-	-	100	0.010	0.010	0.010
10.004	-	-	100	0.020	0.020	0.020
1.012	-	-	100	0.030	0.030	0.030
1.013	-	-	100	0.070	0.070	0.070
				Total	Total	Total
				1.840	1.840	1.840

Free Flowing Outfall Details for SW Network

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.013	SOutfall	56.500	54.445	54.795	1500	0

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Simulation Criteria for SW Network

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 Offline Controls	0
Number of Online Controls	0	Number of Storage Structures	0
		Number of Time/Area Diagrams	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)	19.300	Storm Duration (mins)	30
Ratio R	0.350		

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

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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 19.300 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s)

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

										Water	Surcharged	Flooded
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	
S1.000	S1 15 Winter		100	+30%	100/15 Summer				61.332	0.802	0.000	
S1.001	S2 15 Winter		100	+30%	100/15 Summer				61.310	0.850	0.000	
S2.000	S3 15 Winter		100	+30%	100/15 Summer				61.407	0.747	0.000	
S1.002	S4 15 Winter		100	+30%	100/15 Summer				61.234	0.844	0.000	
S1.003	S5 15 Winter		100	+30%	100/15 Summer				61.055	0.730	0.000	
S3.000	S6 15 Winter		100	+30%					62.566	-0.164	0.000	
S3.001	S7 15 Winter		100	+30%					61.416	-0.149	0.000	
S1.004	S8 15 Winter		100	+30%	100/15 Summer				60.796	0.531	0.000	
S1.005	S9 15 Winter		100	+30%	100/15 Summer				60.340	0.425	0.000	
S1.006	S10 15 Winter		100	+30%	100/15 Summer				59.759	0.849	0.000	
S4.000	S11 15 Winter		100	+30%	100/15 Summer				58.749	0.549	0.000	
S4.001	S12 15 Winter		100	+30%	100/15 Summer				58.736	0.951	0.000	
S1.007	S13 15 Winter		100	+30%	100/15 Summer				58.714	1.404	0.000	
S1.008	S14 15 Winter		100	+30%	100/15 Summer				58.353	1.119	0.000	
S5.000	S15 15 Winter		100	+30%					59.315	0.000	0.000	
S6.000	S16 15 Winter		100	+30%	100/15 Summer				59.409	0.254	0.000	
S5.001	S17 15 Winter		100	+30%	100/15 Summer				59.279	0.274	0.000	
S5.002	S18 15 Winter		100	+30%	100/15 Summer				59.125	0.285	0.000	
S5.003	S19 15 Winter		100	+30%	100/15 Summer				58.970	0.315	0.000	
S5.004	S20 15 Winter		100	+30%	100/15 Summer				58.831	0.356	0.000	
S7.000	S21 15 Winter		100	+30%					59.405	-0.195	0.000	
S7.001	S22 15 Winter		100	+30%					59.021	-0.174	0.000	
S7.002	S23 15 Winter		100	+30%	100/15 Winter				58.930	0.075	0.000	
S8.000	S24 15 Winter		100	+30%	100/15 Summer				58.863	0.438	0.000	
S8.001	S25 15 Winter		100	+30%	100/15 Summer				58.816	0.461	0.000	
S7.003	S26 15 Winter		100	+30%	100/15 Summer				58.774	0.454	0.000	
S5.005	S27 15 Winter		100	+30%	100/15 Summer				58.697	0.427	0.000	
S5.006	S28 15 Winter		100	+30%	100/15 Summer				58.487	0.382	0.000	
S5.007	S29 15 Winter		100	+30%	100/15 Summer				58.237	0.557	0.000	
S1.009	S30 15 Winter		100	+30%	100/15 Summer				57.915	1.250	0.000	
S9.000	S31 15 Winter		100	+30%	100/15 Summer				57.681	0.881	0.000	
S1.010	S32 15 Winter		100	+30%	100/15 Summer				57.555	0.960	0.000	
S1.011	S33 15 Winter		100	+30%	100/15 Summer				56.998	0.478	0.000	
S10.000	S34 15 Winter		100	+30%	100/15 Summer				57.368	0.198	0.000	
S10.001	S35 15 Winter		100	+30%	100/15 Summer				57.296	0.171	0.000	

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

PN	US/MH Name	Flow / Cap.	Overflow (1/s)	Pipe Flow (1/s)	Status	Level Exceeded
S1.000	S1	0.36		20.3	SURCHARGED	
S1.001	S2	0.69		39.2	FLOOD RISK	
S2.000	S3	0.41		53.9	SURCHARGED	
S1.002	S4	1.81		102.0	SURCHARGED	
S1.003	S5	2.28		125.2	SURCHARGED	
S3.000	S6	0.17		21.2	OK	
S3.001	S7	0.25		32.3	OK	
S1.004	S8	1.27		160.7	SURCHARGED	
S1.005	S9	0.78		154.9	SURCHARGED	
S1.006	S10	0.81		164.4	SURCHARGED	
S4.000	S11	0.15		23.5	SURCHARGED	
S4.001	S12	0.17		28.7	SURCHARGED	
S1.007	S13	2.19		215.9	SURCHARGED	
S1.008	S14	2.51		226.4	SURCHARGED	
S5.000	S15	0.17		37.0	OK	
S6.000	S16	0.42		63.4	SURCHARGED	
S5.001	S17	0.69		109.6	SURCHARGED	
S5.002	S18	0.67		112.9	SURCHARGED	
S5.003	S19	0.63		103.8	SURCHARGED	
S5.004	S20	0.58		102.4	SURCHARGED	
S7.000	S21	0.27		42.4	OK	
S7.001	S22	0.36		53.2	OK	
S7.002	S23	0.37		64.1	SURCHARGED	
S8.000	S24	0.46		42.2	SURCHARGED	
S8.001	S25	0.63		49.7	SURCHARGED	
S7.003	S26	1.24		106.1	SURCHARGED	
S5.005	S27	1.31		207.6	SURCHARGED	
S5.006	S28	0.82		199.7	SURCHARGED	
S5.007	S29	0.58		206.5	SURCHARGED	
S1.009	S30	2.28		453.3	SURCHARGED	
S9.000	S31	0.82		37.7	SURCHARGED	
S1.010	S32	2.69		499.4	SURCHARGED	
S1.011	S33	2.80		514.9	SURCHARGED	
S10.000	S34	1.20		35.8	SURCHARGED	
S10.001	S35	1.39		40.0	SURCHARGED	

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Innovyze	Network 2019.1	

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

PN	US/MH		Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume
	Name	Storm							(m)	(m)	(m ³)
S10.002	S36	15 Winter	100	+30%	100/15 Summer				57.217	0.132	0.000
S11.000	S37	15 Winter	100	+30%					57.272	-0.128	0.000
S11.001	S38	15 Winter	100	+30%					57.144	-0.101	0.000
S10.003	S39	15 Winter	100	+30%	100/15 Summer				57.107	0.072	0.000
S10.004	S40	15 Winter	100	+30%	100/15 Summer				56.783	0.158	0.000
S1.012	S41	15 Winter	100	+30%					56.274	-0.176	0.000
S1.013	S42	15 Winter	100	+30%	100/15 Summer				55.591	0.151	0.000

PN	US/MH Name	Pipe Flow / Overflow		Pipe Flow (l/s)	Status	Level Exceeded
		Flow Cap.	Overflow (l/s)			
S10.002	S36	1.48		43.7	SURCHARGED	
S11.000	S37	0.38		21.1	OK	
S11.001	S38	0.44		26.5	OK	
S10.003	S39	0.89		72.9	SURCHARGED	
S10.004	S40	1.38		81.4	SURCHARGED	
S1.012	S41	0.78		598.4	OK	
S1.013	S42	1.17		613.0	SURCHARGED	