

Rogers Cory Partnership				Page 1							
The Old School Old School Road Hook Hampshire RG27 9NJ											
Date 11/03/2020 22:41											
File SW1A.MDX											
Innovyze				Network 2017.1.2							
STORM SEWER DESIGN by the Modified Rational Method											
Design Criteria for Storm											
Pipe Sizes STANDARD Manhole Sizes STANDARD											
FSR Rainfall Model - England and Wales											
Return Period (years)		2		Foul Sewage (l/s/ha)		0.000					
M5-60 (mm)		19.300		Volumetric Runoff Coeff.		0.750					
Ratio R		0.348		PIMP (%)		100					
Maximum Rainfall (mm/hr)		50		Add Flow / Climate Change (%)		10					
Maximum Time of Concentration (mins)		30		Minimum Backdrop Height (m)		0.600					
Maximum Backdrop Height (m) 1.500											
Min Design Depth for Optimisation (m) 1.200											
Min Vel for Auto Design only (m/s) 1.00											
Min Slope for Optimisation (1:X) 500											
Designed with Level Soffits											
Network Design Table for Storm											
« - Indicates pipe capacity < flow											
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	63.568	1.087	58.5	0.073	5.36	0.0	0.600	o	300	Pipe/Conduit	⚠
S1.001	22.780	0.389	58.6	0.062	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S1.002	24.765	0.423	58.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S1.003	53.305	0.911	58.5	0.041	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S1.004	43.357	0.741	58.5	0.040	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S1.005	16.187	0.277	58.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S1.006	86.089	1.472	58.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S1.007	11.421	0.195	58.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S1.008	16.500	0.757	21.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S2.000	8.335	0.034	245.1	0.009	5.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S2.001	11.347	0.046	246.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S2.002	21.530	0.088	244.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S2.003	12.589	0.051	246.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S2.004	78.138	0.318	245.7	0.053	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S2.005	16.422	0.067	245.1	0.009	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S3.000	37.878	1.806	21.0	0.032	5.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S3.001	11.023	0.045	245.0	0.009	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S3.002	20.416	0.083	246.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S3.003	25.487	0.104	245.1	0.052	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S3.004	10.499	0.043	244.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S3.005	74.811	0.304	246.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S3.006	9.668	0.039	247.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S2.006	6.425	0.026	247.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S2.007	52.641	0.214	246.0	0.034	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S2.008	45.162	0.184	245.4	0.039	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
S2.009	18.031	0.073	247.0	0.020	0.00	0.0	0.600	o	300	Pipe/Conduit	⚠
Network Results Table											
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
S1.000	50.00	5.51	28.869	0.073	0.0	0.0	1.0	2.06	145.6	10.9	
S1.001	50.00	5.70	28.782	0.135	0.0	0.0	1.8	2.06	145.5	20.1	
S1.002	50.00	5.90	28.393	0.135	0.0	0.0	1.8	2.06	145.5	20.1	
S1.003	50.00	6.33	27.970	0.176	0.0	0.0	2.4	2.06	145.6	26.2	
S1.004	50.00	6.68	27.059	0.216	0.0	0.0	2.9	2.06	145.6	32.2	
S1.005	50.00	6.81	26.318	0.216	0.0	0.0	2.9	2.06	145.7	32.2	
S1.006	50.00	7.51	26.041	0.216	0.0	0.0	2.9	2.06	145.6	32.2	
S1.007	50.00	7.60	24.569	0.216	0.0	0.0	2.9	2.06	145.5	32.2	
S1.008	50.00	7.68	24.374	0.216	0.0	0.0	2.9	3.38	239.1	32.2	
S2.000	50.00	5.14	23.335	0.009	0.0	0.0	0.1	1.00	70.7	1.3	
S2.001	50.00	5.33	23.381	0.009	0.0	0.0	0.1	1.00	70.4	1.3	
S2.002	50.00	5.69	23.255	0.009	0.0	0.0	0.1	1.00	70.7	1.3	
S2.003	50.00	5.90	23.167	0.009	0.0	0.0	0.1	1.00	70.4	1.3	
S2.004	50.00	7.20	23.116	0.062	0.0	0.0	0.8	1.00	70.6	9.2	
S2.005	50.00	7.48	22.798	0.071	0.0	0.0	1.0	1.00	70.7	10.6	
S3.000	50.00	5.18	23.155	0.032	0.0	0.0	0.4	3.45	243.7	4.8	
S3.001	50.00	5.37	23.349	0.041	0.0	0.0	0.6	1.00	70.7	6.1	
S3.002	50.00	5.71	23.394	0.041	0.0	0.0	0.6	1.00	70.5	6.1	
S3.003	50.00	6.13	23.221	0.093	0.0	0.0	1.3	1.00	70.7	13.9	
S3.004	50.00	6.31	23.117	0.093	0.0	0.0	1.3	1.00	70.8	13.9	
S3.005	50.00	7.56	23.074	0.093	0.0	0.0	1.3	1.00	70.5	13.9	
S3.006	50.00	7.72	22.770	0.093	0.0	0.0	1.3	0.99	70.3	13.9	
S2.006	50.00	7.83	22.731	0.164	0.0	0.0	2.2	1.00	70.4	24.4	
S2.007	49.16	8.71	22.785	0.198	0.0	0.0	2.6	1.00	70.5	29.0	
S2.008	47.15	9.46	22.481	0.237	0.0	0.0	3.0	1.00	70.6	33.3	
S2.009	46.40	9.76	22.367	0.257	0.0	0.0	3.2	1.00	70.4	35.5	
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Network Design Table 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	Auto Design
S2.010	19.280	0.078	247.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S2.011	9.481	0.039	243.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.009	16.505	0.067	246.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.010	13.524	0.055	245.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.011	31.127	0.126	247.0	0.018	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.012	48.776	0.198	246.3	0.046	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.013	7.684	0.031	247.9	0.020	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.014	21.644	0.088	246.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.015	17.006	0.069	246.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S4.000	17.548	0.320	54.8	0.056	5.00	0.0	0.600	o	300	Pipe/Conduit		
S1.016	11.585	0.047	246.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.017	14.801	0.060	246.7	0.025	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.018	12.558	0.051	246.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.019	16.604	0.067	247.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.020	18.356	0.075	244.7	0.015	0.00	0.0	0.600	o	300	Pipe/Conduit		
S5.000	19.609	0.735	26.7	0.016	5.00	0.0	0.600	o	225	Pipe/Conduit		
S5.001	8.980	0.090	99.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
S5.002	29.138	0.172	169.4	0.037	0.00	0.0	0.600	o	225	Pipe/Conduit		
S5.003	14.499	0.102	142.1	0.068	0.00	0.0	0.600	o	225	Pipe/Conduit		
S1.021	27.790	0.087	319.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.000	15.517	0.074	209.7	0.061	5.00	0.0	0.600	o	300	Pipe/Conduit		
S6.001	27.831	0.113	246.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.002	15.722	0.064	245.7	0.009	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.003	16.180	0.066	245.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.004	19.998	0.081	246.9	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.005	32.333	0.131	246.8	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.006	21.759	0.088	247.3	0.021	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.007	14.639	0.060	244.0	0.015	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.008	16.912	0.069	245.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.009	23.588	0.096	245.7	0.018	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.010	27.300	0.111	245.9	0.027	0.00	0.0	0.600	o	300	Pipe/Conduit		
S6.011	22.313	0.091	245.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S2.010	45.63	10.08	22.234	0.257	0.0	0.0	3.2	1.00	70.4	35.5
S2.011	45.26	10.24	22.156	0.257	0.0	0.0	3.2	1.00	71.0	35.5
S1.009	44.64	10.52	22.117	0.473	0.0	0.0	5.7	1.00	70.5	62.9
S1.010	44.14	10.74	22.056	0.473	0.0	0.0	5.7	1.00	70.6	62.9
S1.011	43.07	11.26	21.995	0.491	0.0	0.0	5.7	1.00	70.4	63.0
S1.012	41.52	12.08	21.869	0.537	0.0	0.0	6.0	1.00	70.5	66.4
S1.013	41.28	12.21	21.876	0.557	0.0	0.0	6.2	0.99	70.3	68.5
S1.014	40.64	12.57	21.637	0.557	0.0	0.0	6.2	1.00	70.5	68.5
S1.015	40.16	12.85	21.549	0.557	0.0	0.0	6.2	1.00	70.5	68.5
S4.000	50.00	5.14	21.869	0.056	0.0	0.0	0.8	2.13	150.4	8.3
S1.016	39.83	13.05	21.480	0.613	0.0	0.0	6.6	1.00	70.5	72.7
S1.017	39.43	13.29	21.433	0.638	0.0	0.0	6.8	1.00	70.4	74.9
S1.018	39.09	13.50	21.373	0.638	0.0	0.0	6.8	1.00	70.5	74.9
S1.019	38.66	13.78	21.322	0.638	0.0	0.0	6.8	0.99	70.3	74.9
S1.020	38.19	14.09	21.255	0.653	0.0	0.0	6.8	1.00	70.7	74.9
S5.000	50.00	5.13	22.328	0.016	0.0	0.0	0.2	2.54	101.1	2.4
S5.001	50.00	5.24	21.593	0.016	0.0	0.0	0.2	1.31	52.0	2.4
S5.002	50.00	5.73	21.563	0.053	0.0	0.0	0.7	1.00	39.8	7.9
S5.003	50.00	5.95	21.331	0.121	0.0	0.0	1.6	1.09	43.5	18.0
S1.021	37.42	14.62	21.354	0.774	0.0	0.0	7.8	0.97	61.8	86.3
S6.000	50.00	5.24	22.647	0.061	0.0	0.0	0.8	1.08	76.5	9.1
S6.001	50.00	5.70	22.020	0.061	0.0	0.0	0.8	1.00	70.5	9.1
S6.002	50.00	5.97	21.907	0.070	0.0	0.0	0.9	1.00	70.6	10.4
S6.003	50.00	6.24	21.843	0.070	0.0	0.0	0.9	1.00	70.7	10.4
S6.004	50.00	6.57	21.777	0.100	0.0	0.0	1.4	1.00	70.4	14.9
S6.005	50.00	7.11	21.696	0.114	0.0	0.0	1.5	1.00	70.4	17.0
S6.006	50.00	7.48	21.565	0.135	0.0	0.0	1.8	1.00	70.4	20.1
S6.007	50.00	7.72	21.477	0.150	0.0	0.0	2.0	1.00	70.8	22.3
S6.008	50.00	8.00	21.417	0.150	0.0	0.0	2.0	1.00	70.7	22.3
S6.009	50.00	8.40	21.348	0.168	0.0	0.0	2.3	1.00	70.6	25.0
S6.010	48.76	8.85	21.282	0.195	0.0	0.0	2.6	1.00	70.5	28.3
S6.011	47.76	9.22	21.241	0.195	0.0	0.0	2.6	1.00	70.7	28.3

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Network Design Table for Storm <table><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th>Section Type</th><th>Auto Design</th></tr><tr><td>S1.022</td><td>1.989</td><td>0.022</td><td>90.4</td><td>0.075</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td>Pipe/Conduit</td><td></td></tr></table> Network Results Table <table><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL (m)</th><th>Σ I.Area (ha)</th><th>Σ Base Flow (l/s)</th><th>Foul (l/s)</th><th>Add Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr><tr><td>S1.022</td><td>37.39</td><td>14.64</td><td>21.056</td><td>1.044</td><td>0.0</td><td>0.0</td><td>10.6</td><td>1.65</td><td>116.9</td><td>116.3</td></tr></table>												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	S1.022	1.989	0.022	90.4	0.075	0.00	0.0	0.600	o	300	Pipe/Conduit		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)	S1.022	37.39	14.64	21.056	1.044	0.0	0.0	10.6	1.65	116.9	116.3
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																																														
S1.022	1.989	0.022	90.4	0.075	0.00	0.0	0.600	o	300	Pipe/Conduit																																															
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)																																															
S1.022	37.39	14.64	21.056	1.044	0.0	0.0	10.6	1.65	116.9	116.3																																															
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Manhole Schedules for Storm											
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)
S1	31.633	1.770	Open Manhole	1200	S1.000	29.869	300				
S2	30.562	1.780	Open Manhole	1200	S1.001	28.782	300	S1.000	28.782	300	
S3	30.046	1.653	Open Manhole	1200	S1.002	28.393	300	S1.001	28.393	300	
S4	29.596	1.626	Open Manhole	1200	S1.003	27.970	300	S1.002	27.970	300	
S5	28.900	1.841	Open Manhole	1200	S1.004	27.059	300	S1.003	27.059	300	
S6	28.085	1.767	Open Manhole	1200	S1.005	26.318	300	S1.004	26.318	300	
S7	28.377	2.336	Open Manhole	1200	S1.006	26.041	300	S1.005	26.041	300	
S8	27.360	2.791	Open Manhole	1200	S1.007	24.569	300	S1.006	24.569	300	
S9	27.280	2.906	Open Manhole	1200	S1.008	24.374	300	S1.007	24.374	300	
S15	24.642	1.307	Open Manhole	1200	S2.000	23.335	300				
S16	24.470	1.169	Open Manhole	1200	S2.001	23.301	300	S2.000	23.301	300	
S17	24.369	1.114	Open Manhole	1200	S2.002	23.255	300	S2.001	23.255	300	
S18	24.657	1.490	Open Manhole	1200	S2.003	23.167	300	S2.002	23.167	300	
S19	24.875	1.759	Open Manhole	1200	S2.004	23.116	300	S2.003	23.116	300	
S20	26.284	3.486	Open Manhole	1200	S2.005	22.798	300	S2.004	22.798	300	
S16	26.655	1.500	Open Manhole	1200	S3.000	25.155	300				
S17	26.261	2.912	Open Manhole	1200	S3.001	23.349	300	S3.000	23.349	300	
S18	26.235	2.931	Open Manhole	1200	S3.002	23.304	300	S3.001	23.304	300	
S19	26.313	3.092	Open Manhole	1200	S3.003	23.221	300	S3.002	23.221	300	
S19	26.318	3.801	Open Manhole	1200	S3.004	23.117	300	S3.003	23.117	300	
S19	27.075	4.001	Open Manhole	1200	S3.005	23.074	300	S3.004	23.074	300	
S19	26.620	3.850	Open Manhole	1200	S3.006	22.770	300	S3.005	22.770	300	
S21	26.601	3.870	Open Manhole	1200	S2.006	22.731	300	S2.005	22.731	300	
								S3.006	22.731	300	
S22	26.601	3.896	Open Manhole	1200	S2.007	22.705	300	S2.006	22.705	300	
S23	26.820	4.329	Open Manhole	1200	S2.008	22.491	300	S2.007	22.491	300	
S24	27.018	4.711	Open Manhole	1200	S2.009	22.307	300	S2.008	22.307	300	
S25	27.085	4.851	Open Manhole	1200	S2.010	22.234	300	S2.009	22.234	300	
S26	27.175	5.019	Open Manhole	1200	S2.011	22.156	300	S2.010	22.156	300	
S10	27.147	5.030	Open Manhole	1200	S1.009	22.117	300	S1.008	23.617	300	1500
								S2.011	22.117	300	
S11	26.817	4.767	Open Manhole	1200	S1.010	22.050	300	S1.009	22.050	300	
S12	26.583	4.594	Open Manhole	1200	S1.011	21.995	300	S1.010	21.995	300	
S13	26.150	4.281	Open Manhole	1200	S1.012	21.869	300	S1.011	21.869	300	
S14	24.752	3.082	Open Manhole	1200	S1.013	21.670	300	S1.012	21.671	300	1
S15	24.504	2.867	Open Manhole	1200	S1.014	21.637	300	S1.013	21.639	300	2
S16	23.848	2.299	Open Manhole	1200	S1.015	21.549	300	S1.014	21.549	300	
S33	23.600	1.800	Open Manhole	1200	S4.000	21.800	300				
S17	23.492	2.012	Open Manhole	1200	S1.016	21.480	300	S1.015	21.480	300	
								S4.000	21.480	300	
S18	23.271	1.838	Open Manhole	1200	S1.017	21.433	300	S1.016	21.433	300	
S19	22.328	1.455	Open Manhole	1200	S1.018	21.373	300	S1.017	21.373	300	
S20	22.417	1.095	Open Manhole	1200	S1.019	21.322	300	S1.018	21.322	300	
S21	22.350	1.095	Open Manhole	1200	S1.020	21.255	300	S1.019	21.255	300	
S38	23.753	1.425	Open Manhole	1200	S5.000	22.328	225				
S39	23.400	1.807	Open Manhole	1200	S5.001	21.593	225	S5.000	21.593	225	
S40	23.203	1.700	Open Manhole	1200	S5.002	21.503	225	S5.001	21.503	225	
S41	22.312	0.981	Open Manhole	1200	S5.003	21.331	225	S5.002	21.331	225	
S22	22.017	0.863	Open Manhole	1200	S1.021	21.154	300	S1.020	21.180	300	26
								S5.003	21.229	225	
S22	24.447	1.800	Open Manhole	1200	S6.000	22.647	300				
S23	23.684	1.664	Open Manhole	1200	S6.001	22.020	300	S6.000	22.573	300	553
S24	23.435	1.528	Open Manhole	1200	S6.002	21.907	300	S6.001	21.907	300	
S25	23.206	1.363	Open Manhole	1200	S6.003	21.843	300	S6.002	21.843	300	
S26	22.992	1.215	Open Manhole	1200	S6.004	21.777	300	S6.003	21.777	300	
S27	23.728	2.032	Open Manhole	1200	S6.005	21.696	300	S6.004	21.696	300	
S28	22.650	1.085	Open Manhole	1200	S6.006	21.565	300	S6.005	21.565	300	
S29	22.771	1.294	Open Manhole	1200	S6.007	21.477	300	S6.006	21.477	300	
S31	23.000	1.583	Open Manhole	1200	S6.008	21.417	300	S6.007	21.417	300	
S33	22.248	0.900	Open Manhole	1200	S6.009	21.348	300	S6.008	21.348	300	
S34	22.152	0.900	Open Manhole	1200	S6.010	21.252	300	S6.009	21.252	300	
S35	22.066	0.925	Open Manhole	1200	S6.011	21.141	300	S6.010	21.141	300	
S22	22.000	0.950	Open Manhole	1200	S1.022	21.050	300	S1.021	21.067	300	17
								S6.011	21.050	300	
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Manhole Schedules for Storm <table><thead><tr><th>MH Name</th><th>MH CL (m)</th><th>MH Depth (m)</th><th>MH Connection</th><th>MH Diam., L*W (mm)</th><th>PN</th><th>Pipe Out Invert Level (m)</th><th>Diameter (mm)</th><th>PN</th><th>Pipes In Invert Level (m)</th><th>Diameter (mm)</th><th>Backdrop (mm)</th></tr></thead><tbody><tr><td>S</td><td>22.000</td><td>0.972</td><td>Open Manhole</td><td>0</td><td></td><td>OUTFALL</td><td></td><td>S1.022</td><td>21.028</td><td>300</td><td></td></tr></tbody></table> Free Flowing Outfall Details for Storm <table><thead><tr><th>Outfall Pipe Number</th><th>Outfall Name</th><th>C. Level (m)</th><th>I. Level (m)</th><th>Min I. Level (m)</th><th>D, L (mm)</th><th>W (mm)</th></tr></thead><tbody><tr><td>S1.022</td><td>S</td><td>22.000</td><td>21.028</td><td>0.000</td><td>0</td><td>0</td></tr></tbody></table> Simulation Criteria for Storm Volumetric Runoff Coeff 0.750 Manhole Headloss Coeff (Global) 0.500 Inlet Coeffiecient 0.800 Areal Reduction Factor 1.000 Foul Sewage per hectare (l/s) 0.000 Flow per Person per Day (l/per/day) 0.000 Hot Start (mins) 0 Additional Flow - % of Total Flow 10.000 Run Time (mins) 60 Hot Start Level (mm) 0 MADD Factor * 10m³/ha Storage 2.000 Output Interval (mins) 1 Number of Input Hydrographs 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0 Number of Online Controls 2 Number of Storage Structures 3 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FSR M5-60 (mm) 19.300 Cv (Summer) 0.750 Return Period (years) 2 Ratio R 0.348 Cv (Winter) 0.840 Region England and Wales Profile Type Summer Storm Duration (mins) 30												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)	S	22.000	0.972	Open Manhole	0		OUTFALL		S1.022	21.028	300		Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)	S1.022	S	22.000	21.028	0.000	0	0
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)																																						
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S1.022	S	22.000	21.028	0.000	0	0																																											
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Innovyze Network 2017.1.2																																						
Online Controls for Storm Orifice Manhole: S17, DS/PN: S2.002, Volume (m³): 2.0 Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 23.255 Depth/Flow Relationship Manhole: S22, DS/PN: S1.022, Volume (m³): 4.4 Invert Level (m) 21.050 <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>0.0000</td><td>0.300</td><td>0.0000</td><td>0.500</td><td>0.0000</td><td>0.700</td><td>0.0000</td><td>0.900</td><td>0.0000</td><td>1.100</td><td>0.0000</td></tr><tr><td>0.200</td><td>0.0000</td><td>0.400</td><td>0.0000</td><td>0.600</td><td>0.0000</td><td>0.800</td><td>0.0000</td><td>1.000</td><td>0.0000</td><td>1.200</td><td>0.0000</td></tr></tbody></table>			Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	0.0000	0.300	0.0000	0.500	0.0000	0.700	0.0000	0.900	0.0000	1.100	0.0000	0.200	0.0000	0.400	0.0000	0.600	0.0000	0.800	0.0000	1.000	0.0000	1.200	0.0000
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)																											
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<u>Offline Controls for Storm</u> <u>Orifice Manhole: S20, DS/PN: S1.019, Loop to PN: None</u> Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 21.322		
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Storage Structures for Storm Tank or Pond Manhole: S17, DS/PN: S2.002 Invert Level (m) 23.255 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>43.5</td><td>0.400</td><td>43.5</td><td>0.401</td><td>0.0</td></tr></table> Tank or Pond Manhole: S20, DS/PN: S1.019 Invert Level (m) 21.322 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>8.0</td><td>0.400</td><td>8.0</td><td>0.401</td><td>0.0</td></tr></table> Infiltration Basin Manhole: S22, DS/PN: S1.022 Invert Level (m) 20.900 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 1.00 Infiltration Coefficient Base (m/hr) 0.10700 Safety Factor 2.0 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>749.0</td><td>0.600</td><td>1217.0</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	43.5	0.400	43.5	0.401	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	8.0	0.400	8.0	0.401	0.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	749.0	0.600	1217.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)																													
0.000	43.5	0.400	43.5	0.401	0.0																													
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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 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coefficient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 10.000 Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 1 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 3 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 0.348 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DTS Status ON Inertia Status OFF
Analysis Timestep Fine DVD 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 (%) 40

									Water	Surcharged	Flooded			Pipe
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)	Flow / Cap.	Overflow (l/s)	Flow (l/s)
S1.000	S1	15 Winter	100	+40%					29.988	-0.181	0.000	0.32		44.7
S1.001	S2	15 Winter	100	+40%					28.964	-0.118	0.000	0.66		85.0
S1.002	S3	15 Winter	100	+40%					28.573	-0.120	0.000	0.65		84.1
S1.003	S4	15 Winter	100	+40%					28.178	-0.092	0.000	0.80		110.0
S1.004	S5	15 Winter	100	+40%					27.333	-0.026	0.000	0.97		131.6
S1.005	S6	15 Winter	100	+40%	100/15 Summer				26.661	0.023	0.000	1.06		138.7
S1.006	S7	15 Winter	100	+40%					26.269	-0.072	0.000	0.91		128.5
S1.007	S8	15 Winter	100	+40%	100/15 Summer				24.927	0.058	0.000	1.16		128.7
S1.008	S9	15 Winter	100	+40%	100/15 Winter				24.758	0.084	0.000	0.61		123.3
S2.000	S15	30 Winter	100	+40%	100/15 Winter				24.215	0.580	0.000	0.09		4.5
S2.001	S16	30 Winter	100	+40%	100/15 Winter				24.213	0.612	0.000	0.11		6.4
S2.002	S17	30 Winter	100	+40%	100/15 Summer				24.211	0.656	0.000	0.35		21.7
S2.003	S18	30 Winter	100	+40%	100/15 Summer				24.214	0.747	0.000	0.43		24.4
S2.004	S19	30 Winter	100	+40%	100/15 Summer				24.234	0.818	0.000	0.38		26.1
S2.005	S20	30 Winter	100	+40%	100/15 Summer				24.316	1.218	0.000	0.51		30.7
S3.000	S16	15 Winter	100	+40%					25.215	-0.240	0.000	0.09		20.0
S3.001	S17	30 Winter	100	+40%	100/15 Summer				24.552	0.903	0.000	0.36		20.3
S3.002	S18	30 Winter	100	+40%	100/15 Summer				24.543	0.939	0.000	0.31		19.4
S3.003	S19	30 Winter	100	+40%	100/15 Summer				24.533	1.012	0.000	0.70		44.0
S3.004	S19	30 Winter	100	+40%	100/15 Summer				24.465	1.048	0.000	0.66		37.1
S3.005	S19	30 Winter	100	+40%	100/15 Summer				24.450	1.076	0.000	0.48		32.7
S3.006	S19	30 Winter	100	+40%	100/15 Summer				24.399	1.329	0.000	0.44		24.1
S2.006	S21	30 Winter	100	+40%	100/15 Summer				24.391	1.360	0.000	1.11		55.2
S2.007	S22	30 Winter	100	+40%	100/15 Summer				24.428	1.423	0.000	0.82		54.7
S2.008	S23	30 Winter	100	+40%	100/15 Summer				24.487	1.696	0.000	0.86		56.9
S2.009	S24	15 Winter	100	+40%	100/15 Summer				24.506	1.899	0.000	0.99		59.9
S2.010	S25	15 Winter	100	+40%	100/15 Summer				24.506	1.972	0.000	0.98		59.7
S2.011	S26	15 Winter	100	+40%	100/15 Summer				24.505	2.049	0.000	1.08		59.5
S1.009	S10	15 Winter	100	+40%	100/15 Summer				24.503	2.086	0.000	1.86		111.7
S1.010	S11	30 Winter	100	+40%	100/15 Summer				24.325	1.975	0.000	1.61		93.6
S1.011	S12	30 Winter	100	+40%	100/15 Summer				24.194	1.899	0.000	1.51		86.7
S1.012	S13	30 Winter	100	+40%	100/15 Summer				23.922	1.753	0.000	1.62		107.7
S1.013	S14	30 Winter	100	+40%	100/15 Summer				23.398	1.428	0.000	2.15		112.0
S1.014	S15	30 Winter	100	+40%	100/15 Summer				23.195	1.258	0.000	1.81		112.1
S1.015	S16	30 Winter	100	+40%	100/15 Summer				22.908	1.059	0.000	1.87		112.6
S4.000	S33	30 Winter	100	+40%	100/15 Summer				22.689	0.589	0.000	0.18		23.2
S1.016	S17	30 Winter	100	+40%	100/15 Summer				22.673	0.893	0.000	2.23		126.4
S1.017	S18	30 Winter	100	+40%	100/15 Summer				22.418	0.685	0.000	2.24		132.0
S1.018	S19	30 Winter	100	+40%	100/15 Summer				22.116	0.443	0.000	2.30		132.2
S1.019	S20	30 Winter	100	+40%	100/15 Summer	100/15 Summer		38	21.940	0.218	0.000	1.14	57.3	68.1
S1.020	S21	30 Winter	100	+40%	100/15 Summer				21.768	0.213	0.000	1.16		70.7
S5.000	S38	15 Winter	100	+40%					22.378	-0.175	0.000	0.11		10.0
S5.001	S39	15 Winter	100	+40%	100/15 Summer				22.022	0.204	0.000	0.27		11.3
S5.002	S40	15 Winter	100	+40%	100/15 Summer				22.011	0.283	0.000	0.80		29.6
S5.003	S41	15 Winter	100	+40%	100/15 Summer				21.992	0.346	0.000	1.77		67.4
S1.021	S22	30 Winter	100	+40%	100/15 Summer				21.682	0.228	0.000	1.94		108.3
S6.000	S22	15 Winter	100	+40%					22.815	-0.132	0.000	0.59		37.8
S6.001	S23	15 Winter	100	+40%					22.260	-0.060	0.000	0.59		37.8
S6.002	S24	15 Winter	100	+40%	100/15 Winter				22.232	0.025	0.000	0.70		41.7
S6.003	S25	15 Winter	100	+40%	100/15 Winter				22.172	0.029	0.000	0.66		39.3
S6.004	S26	15 Winter	100	+40%	100/15 Winter				22.114	0.037	0.000	0.88		53.8
S6.005	S27	15 Winter	100	+40%	100/15 Winter				22.032	0.036	0.000	0.86		55.5
S6.006	S28	15 Winter	100	+40%	100/15 Summer				21.945	0.080	0.000	0.93		57.5
S6.007	S29	15 Winter	100	+40%	100/15 Summer				21.862	0.085	0.000	1.03		61.2
S6.008	S31	15 Winter	100	+40%	100/15 Summer				21.782	0.065	0.000	0.99		59.9
S6.009	S33	15 Winter	100	+40%	100/15 Summer				21.701	0.053	0.000	1.04		65.2
S6.010	S34	15 Winter	100	+40%	100/15 Summer				21.602	0.050	0.000	1.14		72.2
S6.011	S35	15 Winter	100	+40%	100/15 Winter				21.457	0.016	0.000	1.16		72.1
S1.022	S22	240 Winter	100	+40%	100/180 Winter				21.361	0.011	0.000	0.00		0.0

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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>		
	US/MH	Level
PN	Name	Status
		Exceeded
S1.000	S1	OK
S1.001	S2	OK
S1.002	S3	OK
S1.003	S4	OK
S1.004	S5	OK
S1.005	S6	SURCHARGED
S1.006	S7	OK
S1.007	S8	SURCHARGED
S1.008	S9	SURCHARGED
S2.000	S15	SURCHARGED
S2.001	S16	FLOOD RISK
S2.002	S17	FLOOD RISK
S2.003	S18	SURCHARGED
S2.004	S19	SURCHARGED
S2.005	S20	SURCHARGED
S3.000	S16	OK
S3.001	S17	SURCHARGED
S3.002	S18	SURCHARGED
S3.003	S19	SURCHARGED
S3.004	S19	SURCHARGED
S3.005	S19	SURCHARGED
S3.006	S19	SURCHARGED
S2.006	S21	SURCHARGED
S2.007	S22	SURCHARGED
S2.008	S23	SURCHARGED
S2.009	S24	SURCHARGED
S2.010	S25	SURCHARGED
S2.011	S26	SURCHARGED
S1.009	S10	SURCHARGED
S1.010	S11	SURCHARGED
S1.011	S12	SURCHARGED
S1.012	S13	SURCHARGED
S1.013	S14	SURCHARGED
S1.014	S15	SURCHARGED
S1.015	S16	SURCHARGED
S4.000	S33	SURCHARGED
S1.016	S17	SURCHARGED
S1.017	S18	SURCHARGED
S1.018	S19	SURCHARGED
S1.019	S20	SURCHARGED
S1.020	S21	SURCHARGED
S5.000	S38	OK
S5.001	S39	SURCHARGED
S5.002	S40	SURCHARGED
S5.003	S41	SURCHARGED
S1.021	S22	SURCHARGED
S6.000	S22	OK
S6.001	S23	OK
S6.002	S24	SURCHARGED
S6.003	S25	SURCHARGED
S6.004	S26	SURCHARGED
S6.005	S27	SURCHARGED
S6.006	S28	SURCHARGED
S6.007	S29	SURCHARGED
S6.008	S31	SURCHARGED
S6.009	S33	SURCHARGED
S6.010	S34	SURCHARGED
S6.011	S35	SURCHARGED
S1.022	S22	SURCHARGED
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