







Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for 16153 NET 2 SWS.SWS

Pipe Sizes SWS NET 2 Manhole Sizes SWS NET 2

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.404	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
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 16153 NET 2 SWS.SWS

« - 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
S1.000	46.595	0.479	97.3	0.202	5.00	0.0	0.600		o	300	Pipe/Conduit	
S2.000	21.282	0.142	149.9	0.081	5.00	0.0	0.600		o	225	Pipe/Conduit	
S2.001	13.732	0.092	149.3	0.053	0.00	0.0	0.600		o	225	Pipe/Conduit	
S2.002	20.061	0.134	149.7	0.042	0.00	0.0	0.600		o	225	Pipe/Conduit	
S1.001	7.156	0.495	14.5	0.065	0.00	0.0	0.600		o	375	Pipe/Conduit	
S3.000	30.730	0.181	169.8	0.102	5.00	0.0	0.600		o	300	Pipe/Conduit	
S3.001	17.641	0.111	158.9	0.093	0.00	0.0	0.600		o	300	Pipe/Conduit	
S3.002	25.343	0.075	337.9	0.037	0.00	0.0	0.600		o	375	Pipe/Conduit	
S3.003	14.262	0.057	250.2	0.016	0.00	0.0	0.600		o	375	Pipe/Conduit	
S1.002	10.553	0.048	219.9	0.000	0.00	0.0	0.600		o	450	Pipe/Conduit	
S1.003	53.200	0.213	249.8	0.091	0.00	0.0	0.600		o	450	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	5.49	92.950	0.202	0.0	0.0	0.0	1.59	112.7	27.3
S2.000	50.00	5.33	92.914	0.081	0.0	0.0	0.0	1.07	42.4	11.0
S2.001	50.00	5.55	92.772	0.134	0.0	0.0	0.0	1.07	42.5	18.1
S2.002	50.00	5.86	92.680	0.176	0.0	0.0	0.0	1.07	42.4	23.8
S1.001	50.00	5.89	92.396	0.443	0.0	0.0	0.0	4.79	528.7	60.0
S3.000	50.00	5.43	92.400	0.102	0.0	0.0	0.0	1.20	85.1	13.8
S3.001	50.00	5.66	92.219	0.195	0.0	0.0	0.0	1.24	88.0	26.4
S3.002	50.00	6.09	92.033	0.232	0.0	0.0	0.0	0.98	108.2	31.4
S3.003	50.00	6.30	91.958	0.248	0.0	0.0	0.0	1.14	126.0	33.6
S1.002	50.00	6.43	91.826	0.691	0.0	0.0	0.0	1.37	217.4	93.6
S1.003	50.00	7.12	91.778	0.782	0.0	0.0	0.0	1.28	203.9	105.9



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Network Design Table for 16153 NET 2 SWS.SWS

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
S4.000	31.005	0.175	177.2	0.108	5.00	0.0	0.600		o	375	Pipe/Conduit	
S4.001	31.035	0.390	79.6	0.105	0.00	0.0	0.600		o	375	Pipe/Conduit	
S1.004	69.080	0.461	150.0	0.294	0.00	0.0	0.600		o	525	Pipe/Conduit	
S1.005	69.555	0.464	150.0	0.140	0.00	0.0	0.600		o	525	Pipe/Conduit	
S5.000	13.561	0.170	79.8	0.043	5.00	0.0	0.600		o	375	Pipe/Conduit	
S5.001	45.392	0.380	119.5	0.088	0.00	0.0	0.600		o	375	Pipe/Conduit	
S5.002	19.109	0.184	103.9	0.108	0.00	0.0	0.600		o	375	Pipe/Conduit	
S1.006	95.509	0.637	150.0	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
S1.007	61.914	0.413	150.0	0.204	0.00	0.0	0.600		o	525	Pipe/Conduit	
S1.008	45.710	0.305	149.9	0.000	0.00	0.0	0.600	1 \_ /	300	1:1 Ditch		
S1.009	45.513	0.090	505.7	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S6.000	40.000	0.215	186.0	0.052	5.00	0.0	0.600	0.045 3 \=/	600	1:3 Swale		
S6.001	12.578	0.052	241.9	0.158	0.00	0.0	0.600		o	375	Pipe/Conduit	
S1.010	7.090	0.024	295.4	0.095	0.00	0.0	0.600		o	600	Pipe/Conduit	
S7.000	20.616	0.143	144.2	0.051	5.00	0.0	0.600		o	300	Pipe/Conduit	
S8.000	3.789	0.038	99.7	0.173	5.00	0.0	0.600		o	300	Pipe/Conduit	
S8.001	13.515	0.134	100.9	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)	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)
S4.000	50.00	5.38	92.205	0.108	0.0	0.0	0.0	1.36	150.0	14.6
S4.001	50.00	5.63	92.030	0.213	0.0	0.0	0.0	2.03	224.5	28.8
S1.004	50.00	7.75	91.490	1.289	0.0	0.0	0.0	1.83	395.4	174.5
S1.005	50.00	8.39	91.029	1.429	0.0	0.0	0.0	1.83	395.4	193.5
S5.000	50.00	5.11	91.450	0.043	0.0	0.0	0.0	2.03	224.2	5.8
S5.001	50.00	5.57	91.280	0.131	0.0	0.0	0.0	1.66	183.0	17.7
S5.002	50.00	5.75	90.900	0.239	0.0	0.0	0.0	1.78	196.3	32.3
S1.006	50.00	9.26	90.566	1.668	0.0	0.0	0.0	1.83	395.4	225.8
S1.007	50.00	9.82	89.929	1.872	0.0	0.0	0.0	1.83	395.4	253.5
S1.008	49.96	10.20	89.516	1.872	0.0	0.0	0.0	2.04	367.6	253.5
S1.009	48.19	10.90	89.200	1.872	0.0	0.0	0.0	1.08	304.2	253.5
S6.000	50.00	6.88	89.350	0.052	0.0	0.0	0.0	0.35	55.9	7.0
S6.001	50.00	7.06	89.133	0.210	0.0	0.0	0.0	1.16	128.2	28.5
S1.010	47.99	10.98	89.081	2.177	0.0	0.0	0.0	1.41	399.1	283.0
S7.000	50.00	5.26	91.900	0.051	0.0	0.0	0.0	1.31	92.4	6.9
S8.000	50.00	5.04	92.650	0.173	0.0	0.0	0.0	1.57	111.3	23.5
S8.001	50.00	5.18	92.612	0.173	0.0	0.0	0.0	1.57	110.7	23.5



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Network Design Table for 16153 NET 2 SWS.SWS

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
S7.001	56.369	0.867	65.0	0.147	0.00	0.0	0.600		o	375	Pipe/Conduit	
S9.000	18.367	0.182	100.9	0.114	5.00	0.0	0.600		o	300	Pipe/Conduit	
S9.001	9.187	0.117	78.5	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S9.002	20.208	0.174	116.1	0.070	0.00	0.0	0.600		o	300	Pipe/Conduit	
S9.003	55.060	0.545	101.0	0.086	0.00	0.0	0.600		o	300	Pipe/Conduit	
S9.004	40.839	0.460	88.8	0.090	0.00	0.0	0.600		o	375	Pipe/Conduit	
S9.005	33.421	0.307	108.9	0.137	0.00	0.0	0.600		o	450	Pipe/Conduit	
S7.002	60.246	0.394	152.9	0.199	0.00	0.0	0.600		o	600	Pipe/Conduit	
S10.000	65.201	0.745	87.5	0.192	5.00	0.0	0.600		o	300	Pipe/Conduit	
S10.001	41.911	0.859	48.8	0.209	0.00	0.0	0.600		o	375	Pipe/Conduit	
S7.003	13.739	0.114	120.5	0.129	0.00	0.0	0.600		o	600	Pipe/Conduit	
S7.004	71.462	0.238	300.3	0.149	0.00	0.0	0.600		o	600	Pipe/Conduit	
S7.005	25.530	0.367	69.6	0.190	0.00	0.0	0.600		o	600	Pipe/Conduit	
S7.006	16.243	0.032	507.6	0.044	0.00	0.0	0.600		o	600	Pipe/Conduit	
S7.007	72.730	0.145	501.6	0.000	0.00	0.0	0.600		o	900	Pipe/Conduit	
S11.000	37.194	0.248	150.0	0.073	5.00	0.0	0.600		o	225	Pipe/Conduit	
S11.001	7.186	0.048	150.0	0.097	0.00	0.0	0.600		o	225	Pipe/Conduit	
S11.002	9.716	0.088	110.4	0.105	0.00	0.0	0.600		o	300	Pipe/Conduit	
S11.003	54.286	0.181	299.9	0.124	0.00	0.0	0.600		o	375	Pipe/Conduit	
S11.004	54.588	0.182	300.0	0.032	0.00	0.0	0.600		o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S7.001	50.00	5.68	91.682	0.371	0.0	0.0	0.0	2.25	248.5	50.3
S9.000	50.00	5.20	92.675	0.114	0.0	0.0	0.0	1.57	110.6	15.4
S9.001	50.00	5.28	92.493	0.114	0.0	0.0	0.0	1.78	125.5	15.4
S9.002	50.00	5.51	92.376	0.184	0.0	0.0	0.0	1.46	103.1	25.0
S9.003	50.00	6.10	92.202	0.270	0.0	0.0	0.0	1.56	110.6	36.6
S9.004	50.00	6.45	91.582	0.360	0.0	0.0	0.0	1.92	212.5	48.8
S9.005	50.00	6.74	91.047	0.497	0.0	0.0	0.0	1.95	309.8	67.3
S7.002	50.00	7.25	90.590	1.067	0.0	0.0	0.0	1.97	556.2	144.5
S10.000	50.00	5.65	92.100	0.192	0.0	0.0	0.0	1.68	118.9	26.0
S10.001	50.00	5.91	91.280	0.401	0.0	0.0	0.0	2.60	287.1	54.3
S7.003	50.00	7.35	90.196	1.597	0.0	0.0	0.0	2.22	626.9	216.2
S7.004	50.00	8.20	90.082	1.746	0.0	0.0	0.0	1.40	395.9	236.4
S7.005	50.00	8.35	89.844	1.935	0.0	0.0	0.0	2.92	826.3	262.0
S7.006	50.00	8.60	89.477	1.979	0.0	0.0	0.0	1.07	303.7	268.0
S7.007	50.00	9.47	89.445	1.979	0.0	0.0	0.0	1.39	885.6	268.0
S11.000	50.00	5.58	90.545	0.073	0.0	0.0	0.0	1.07	42.4	9.9
S11.001	50.00	5.69	90.297	0.170	0.0	0.0	0.0	1.07	42.4	23.0
S11.002	50.00	5.80	90.174	0.275	0.0	0.0	0.0	1.50	105.7	37.3
S11.003	50.00	6.67	90.011	0.400	0.0	0.0	0.0	1.04	115.0	54.1
S11.004	50.00	7.55	89.830	0.432	0.0	0.0	0.0	1.04	115.0	58.4



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Network Design Table for 16153 NET 2 SWS.SWS

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
S12.000	54.282	0.510	106.4	0.096	5.00	0.0	0.600		o	225	Pipe/Conduit	
S12.001	48.512	0.297	163.3	0.144	0.00	0.0	0.600		o	300	Pipe/Conduit	
S12.002	104.672	0.641	163.3	0.090	0.00	0.0	0.600		o	300	Pipe/Conduit	
S13.000	30.849	0.500	61.7	0.076	5.00	0.0	0.600		o	150	Pipe/Conduit	
S13.001	9.378	0.093	100.8	0.033	0.00	0.0	0.600		o	225	Pipe/Conduit	
S13.002	10.472	0.300	34.9	0.035	0.00	0.0	0.600		o	225	Pipe/Conduit	
S13.003	30.552	0.357	85.6	0.083	0.00	0.0	0.600		o	300	Pipe/Conduit	
S13.004	8.266	0.130	63.6	0.067	0.00	0.0	0.600		o	300	Pipe/Conduit	
S13.005	30.144	0.151	199.6	0.024	0.00	0.0	0.600		o	300	Pipe/Conduit	
S13.006	24.912	0.106	235.0	0.055	0.00	0.0	0.600		o	300	Pipe/Conduit	
S13.007	24.834	0.083	299.2	0.049	0.00	0.0	0.600		o	300	Pipe/Conduit	
S14.000	14.382	0.143	100.6	0.114	5.00	0.0	0.600		o	150	Pipe/Conduit	
S7.008	21.497	0.076	282.9	0.126	0.00	0.0	0.600		o	300	Pipe/Conduit	
S7.009	10.910	0.043	253.7	0.027	0.00	0.0	0.600		o	300	Pipe/Conduit	
S7.010	74.999	0.521	144.0	0.128	0.00	0.0	0.600		o	450	Pipe/Conduit	
S15.000	28.497	0.095	300.0	0.119	5.00	0.0	0.600		o	225	Pipe/Conduit	
S1.011	14.449	0.029	498.2	0.072	0.00	0.0	0.600		o	675	Pipe/Conduit	
S1.012	64.369	0.070	919.6	0.118	0.00	0.0	0.600	0.045	3 \=/	1000	1:3 Swale	
S1.013	16.253	0.070	232.2	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit	
S16.000	27.531	0.329	83.7	0.035	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)
S12.000	50.00	5.71	91.800	0.096	0.0	0.0	0.0	1.27	50.4	13.0
S12.001	50.00	6.37	91.215	0.240	0.0	0.0	0.0	1.23	86.8	32.5
S12.002	50.00	7.79	90.918	0.330	0.0	0.0	0.0	1.23	86.8	44.7
S13.000	50.00	5.40	91.200	0.076	0.0	0.0	0.0	1.28	22.7	10.2
S13.001	50.00	5.52	90.625	0.109	0.0	0.0	0.0	1.30	51.8	14.7
S13.002	50.00	5.60	90.532	0.144	0.0	0.0	0.0	2.22	88.3	19.5
S13.003	50.00	5.90	90.157	0.227	0.0	0.0	0.0	1.70	120.2	30.8
S13.004	50.00	5.97	89.800	0.294	0.0	0.0	0.0	1.97	139.6	39.8
S13.005	50.00	6.42	89.670	0.318	0.0	0.0	0.0	1.11	78.4	43.0
S13.006	50.00	6.83	89.519	0.373	0.0	0.0	0.0	1.02	72.2	50.4
S13.007	50.00	7.29	89.413	0.421	0.0	0.0	0.0	0.90	63.9	57.0
S14.000	50.00	5.24	89.800	0.114	0.0	0.0	0.0	1.00	17.7	15.5
S7.008	50.00	5.39	89.300	0.000	2.0	0.0	0.0	0.93	65.7	2.0
S7.009	50.00	5.57	89.224	0.027	2.0	0.0	0.0	0.98	69.4	5.7
S7.010	50.00	6.31	89.031	0.155	2.0	0.0	0.0	1.69	269.2	23.0
S15.000	50.00	5.63	88.830	0.119	0.0	0.0	0.0	0.75	29.8	16.1
S1.011	47.50	11.19	88.285	2.523	2.0	0.0	0.0	1.17	417.7	326.6
S1.012	36.64	17.51	88.256	2.641	2.0	0.0	0.0	0.17	36.9	326.6
S1.013	36.40	17.69	88.186	2.641	2.0	0.0	0.0	1.47	317.3	326.6
S16.000	50.00	5.32	89.345	0.035	0.0	0.0	0.0	1.43	56.9	4.7



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Network Design Table for 16153 NET 2 SWS.SWS

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	
S16.001	11.793	0.478	24.7	0.046	0.00	0.0	0.600		o	450	Pipe/Conduit		
S16.002	48.476	0.162	299.2	0.125	0.00	0.0	0.600		o	450	Pipe/Conduit		
S16.003	32.931	0.110	299.4	0.129	0.00	0.0	0.600		o	450	Pipe/Conduit		
S16.004	9.320	0.031	300.6	0.168	0.00	0.0	0.600		o	450	Pipe/Conduit		
S16.005	21.359	0.065	328.6	0.042	0.00	0.0	0.600		o	450	Pipe/Conduit		
S17.000	45.718	0.152	300.8	0.111	5.00	0.0	0.600		o	300	Pipe/Conduit		
S17.001	13.269	0.044	301.6	0.076	0.00	0.0	0.600		o	300	Pipe/Conduit		
S17.002	26.391	0.088	299.9	0.054	0.00	0.0	0.600		o	300	Pipe/Conduit		
S17.003	14.866	0.050	297.3	0.035	0.00	0.0	0.600		o	300	Pipe/Conduit		
S17.004	13.476	0.045	300.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit		
S1.014	23.081	0.046	501.8	0.000	0.00	0.0		0.045	3	\=/	2000	1:3 Swale	
S1.015	36.956	0.074	499.4	0.014	0.00	0.0		0.045	3	\=/	2000	1:3 Swale	
S1.016	36.956	0.074	499.4	0.072	0.00	0.0		0.045	3	\=/	2000	1:3 Swale	
S1.017	19.482	0.065	299.7	0.072	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)
S16.001	50.00	5.37	88.791	0.081	0.0	0.0	0.0	4.11	653.1	10.9
S16.002	50.00	6.06	88.313	0.205	0.0	0.0	0.0	1.17	186.1	27.8
S16.003	50.00	6.53	88.151	0.334	0.0	0.0	0.0	1.17	186.0	45.2
S16.004	50.00	6.66	88.041	0.502	0.0	0.0	0.0	1.17	185.6	68.0
S16.005	50.00	6.98	88.010	0.544	0.0	0.0	0.0	1.12	177.5	73.7
S17.000	50.00	5.85	88.462	0.111	0.0	0.0	0.0	0.90	63.7	15.0
S17.001	50.00	6.09	88.310	0.186	0.0	0.0	0.0	0.90	63.6	25.2
S17.002	50.00	6.58	88.266	0.240	0.0	0.0	0.0	0.90	63.8	32.5
S17.003	50.00	6.85	88.178	0.275	0.0	0.0	0.0	0.91	64.1	37.3
S17.004	50.00	7.10	88.128	0.275	0.0	0.0	0.0	0.90	63.8	37.3
S1.014	34.57	19.24	87.945	3.460	2.0	0.0	0.0	0.25	91.0	326.6
S1.015	33.41	20.33	87.899	3.474	2.0	0.0	0.0	0.57	1547.2	326.6
S1.016	31.07	22.81	87.825	3.546	2.0	0.0	0.0	0.25	91.2	326.6
S1.017	50.00	5.36	87.751	0.000	14.6	0.0	0.0	0.90	63.8	14.6



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Online Controls for 16153 NET 2 SWS.SWS

Hydro-Brake® Optimum Manhole: S24, DS/PN: S6.001, Volume (m<sup>3</sup>): 317.2

Unit Reference	MD-SHE-0103-5000-1200-5000
Design Head (m)	1.200
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	103
Invert Level (m)	89.133
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	5.0	Kick-Flo®	0.745	4.0
Flush-Flo™	0.354	5.0	Mean Flow over Head Range	-	4.4

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)	Depth (m)	Flow (l/s)
0.100	3.4	0.800	4.1	2.000	6.3	4.000	8.8	7.000	11.5
0.200	4.7	1.000	4.6	2.200	6.6	4.500	9.3	7.500	11.8
0.300	5.0	1.200	5.0	2.400	6.9	5.000	9.8	8.000	12.2
0.400	5.0	1.400	5.4	2.600	7.2	5.500	10.2	8.500	12.6
0.500	4.9	1.600	5.7	3.000	7.7	6.000	10.7	9.000	12.9
0.600	4.7	1.800	6.0	3.500	8.3	6.500	11.1	9.500	13.3

Hydro-Brake® Optimum Manhole: S25, DS/PN: S1.010, Volume (m<sup>3</sup>): 15.3

Unit Reference	MD-SHE-0105-5000-1000-5000
Design Head (m)	1.000
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	105
Invert Level (m)	89.081
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	5.0	Kick-Flo®	0.637	4.1
Flush-Flo™	0.296	5.0	Mean Flow over Head Range	-	4.3

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

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	3.6	0.400	4.9	0.800	4.5	1.400	5.8	2.000	6.9
0.200	4.8	0.500	4.7	1.000	5.0	1.600	6.2	2.200	7.2
0.300	5.0	0.600	4.3	1.200	5.4	1.800	6.6	2.400	7.5





Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Hydro-Brake® Optimum Manhole: S25, DS/PN: S1.010, Volume (m³): 15.3

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)
2.600	7.8	4.000	9.6	5.500	11.1	7.000	12.5	8.500	13.7
3.000	8.4	4.500	10.1	6.000	11.6	7.500	12.9	9.000	14.1
3.500	9.0	5.000	10.6	6.500	12.1	8.000	13.3	9.500	14.5

Orifice Manhole: SOR, DS/PN: S8.001, Volume (m³): 1.0

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 92.612

Hydro-Brake® Optimum Manhole: S62, DS/PN: S7.008, Volume (m³): 65.7

Unit Reference MD-SHE-0050-1500-1900-1500  
 Design Head (m) 1.900  
 Design Flow (l/s) 1.5  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 50  
 Invert Level (m) 89.300  
 Minimum Outlet Pipe Diameter (mm) 75  
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.900	1.5	Kick-Flo®	0.442	0.8
Flush-Flo™	0.219	0.9	Mean Flow over Head Range	-	1.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.9	0.800	1.0	2.000	1.5	4.000	2.1	7.000	2.7
0.200	0.9	1.000	1.1	2.200	1.6	4.500	2.2	7.500	2.8
0.300	0.9	1.200	1.2	2.400	1.7	5.000	2.3	8.000	2.9
0.400	0.9	1.400	1.3	2.600	1.7	5.500	2.4	8.500	3.0
0.500	0.8	1.600	1.4	3.000	1.8	6.000	2.5	9.000	3.1
0.600	0.9	1.800	1.5	3.500	2.0	6.500	2.6	9.500	3.2

Hydro-Brake® Optimum Manhole: S68, DS/PN: S1.013, Volume (m³): 920.6

Unit Reference MD-SHE-0094-5000-1800-5000  
 Design Head (m) 1.800  
 Design Flow (l/s) 5.0  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 94  
 Invert Level (m) 88.186  
 Minimum Outlet Pipe Diameter (mm) 150  
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.800	5.0	Kick-Flo®	0.838	3.5
Flush-Flo™	0.411	4.4	Mean Flow over Head Range	-	4.1



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Hydro-Brake® Optimum Manhole: S68, DS/PN: S1.013, Volume (m³): 920.6

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.0	0.800	3.7	2.000	5.2	4.000	7.3	7.000	9.5
0.200	4.0	1.000	3.8	2.200	5.5	4.500	7.7	7.500	9.8
0.300	4.3	1.200	4.1	2.400	5.7	5.000	8.1	8.000	10.1
0.400	4.4	1.400	4.4	2.600	5.9	5.500	8.4	8.500	10.4
0.500	4.4	1.600	4.7	3.000	6.3	6.000	8.8	9.000	10.7
0.600	4.3	1.800	5.0	3.500	6.8	6.500	9.1	9.500	11.0

Complex Manhole: S81, DS/PN: S1.015, Volume (m³): 254.0

Orifice

Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 87.899

Weir

Discharge Coef 0.544 Width (m) 2.000 Invert Level (m) 89.100

Complex Manhole: S82, DS/PN: S1.016, Volume (m³): 446.5

Orifice

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 87.825

Weir

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 88.750

Hydro-Brake® Optimum Manhole: S83, DS/PN: S1.017, Volume (m³): 352.7

Unit Reference	MD-SHE-0165-1460-1500-1460
Design Head (m)	1.500
Design Flow (l/s)	14.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	165
Invert Level (m)	87.751
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	14.6	Kick-Flo®	0.952	11.8
Flush-Flo™	0.443	14.5	Mean Flow over Head Range	-	12.6

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

.  
.  
.

Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Hydro-Brake® Optimum Manhole: S83, DS/PN: S1.017, Volume (m<sup>3</sup>): 352.7

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	5.9	0.800	13.5	2.000	16.7	4.000	23.3	7.000	30.5
0.200	13.1	1.000	12.0	2.200	17.5	4.500	24.6	7.500	31.5
0.300	14.2	1.200	13.1	2.400	18.2	5.000	25.9	8.000	32.5
0.400	14.5	1.400	14.1	2.600	18.9	5.500	27.1	8.500	33.5
0.500	14.5	1.600	15.0	3.000	20.3	6.000	28.3	9.000	34.4
0.600	14.3	1.800	15.9	3.500	21.8	6.500	29.4	9.500	35.3

.  
.  
.



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Storage Structures for 16153 NET 2 SWS.SWS

Tank or Pond Manhole: S25, DS/PN: S1.010

Invert Level (m) 89.081

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	885.0	1.300	1755.0

Porous Car Park Manhole: SOR, DS/PN: S8.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	130.0
Max Percolation (l/s)	108.3	Slope (1:X)	150.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	92.612	Membrane Depth (mm)	0

Tank or Pond Manhole: S62, DS/PN: S7.008

Invert Level (m) 89.300

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	1375.0	2.200	3432.0



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153 NET  
2 SWS.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/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 8 Number of Storage Structures 3 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750  
 Region England and Wales Ratio R 0.405 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status ON  
 DVD Status OFF  
 Inertia Status OFF

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.	Water Level (m)	Surcharged Depth (m)
S1.000	S1	15 Winter	1	+0%	100/15 Summer	100/15 Winter			93.056	-0.194
S2.000	S2	15 Winter	1	+0%	30/15 Summer	100/15 Summer			92.998	-0.141
S2.001	S3	15 Winter	1	+0%	30/15 Summer	100/15 Summer			92.881	-0.116
S2.002	S4	15 Winter	1	+0%	30/15 Summer	100/15 Summer			92.803	-0.102
S1.001	S5	15 Winter	1	+0%	100/15 Summer	100/15 Summer			92.512	-0.259
S3.000	S6	15 Winter	1	+0%	100/15 Summer	100/15 Summer			92.487	-0.213
S3.001	S7	15 Winter	1	+0%	30/15 Summer				92.338	-0.181
S3.002	S8	15 Winter	1	+0%	30/15 Summer				92.179	-0.229
S3.003	S9	15 Winter	1	+0%	30/15 Summer				92.108	-0.225
S1.002	S10	15 Winter	1	+0%	30/15 Summer	100/15 Winter			92.069	-0.207
S1.003	S11	15 Winter	1	+0%	30/15 Summer				92.009	-0.219
S4.000	S12	15 Winter	1	+0%	100/15 Summer				92.289	-0.291
S4.001	S13	15 Winter	1	+0%	100/15 Summer				92.122	-0.283
S1.004	S14	15 Winter	1	+0%	100/15 Summer	100/15 Winter			91.725	-0.290
S1.005	S15	15 Winter	1	+0%	30/15 Winter				91.275	-0.280
S5.000	S16	15 Winter	1	+0%	100/15 Summer				91.497	-0.328
S5.001	S17	15 Winter	1	+0%	100/15 Summer				91.359	-0.296
S5.002	S18	15 Winter	1	+0%	100/15 Summer				91.007	-0.268
S1.006	S19	15 Winter	1	+0%	30/15 Summer				90.826	-0.265
S1.007	S20	15 Winter	1	+0%	30/15 Summer	100/15 Winter			90.205	-0.249
S1.008	S21	15 Winter	1	+0%					89.741	-0.685
S1.009	S22	15 Winter	1	+0%	30/15 Summer				89.544	-0.256
S6.000	S23	30 Winter	1	+0%					89.459	-1.441
S6.001	S24	30 Winter	1	+0%	30/15 Summer				89.459	-0.049
S1.010	S25	960 Winter	1	+0%	30/240 Winter				89.410	-0.271
S7.000	S26	15 Winter	1	+0%	100/15 Summer				91.960	-0.240
S8.000	SPP	15 Winter	1	+0%	30/15 Summer	100/30 Winter			92.870	-0.080
S8.001	SOR	15 Winter	1	+0%	30/15 Summer				92.867	-0.045
S7.001	S27	15 Winter	1	+0%	100/15 Summer				91.775	-0.282

.  
.  
.

Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153 NET  
2 SWS.SWS

PN	US/MH Name	Flooded			Pipe		Level Exceeded
		Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	
S1.000	S1	0.000	0.26		27.7	OK	1
S2.000	S2	0.000	0.29		11.1	OK	2
S2.001	S3	0.000	0.47		17.5	OK	4
S2.002	S4	0.000	0.58		22.3	OK	4
S1.001	S5	0.000	0.21		57.7	OK	2
S3.000	S6	0.000	0.18		14.0	OK	2
S3.001	S7	0.000	0.33		25.0	OK	
S3.002	S8	0.000	0.31		28.6	OK	
S3.003	S9	0.000	0.31		30.7	OK	
S1.002	S10	0.000	0.56		86.7	OK	1
S1.003	S11	0.000	0.50		94.0	OK	
S4.000	S12	0.000	0.11		14.8	OK	
S4.001	S13	0.000	0.14		27.2	OK	
S1.004	S14	0.000	0.41		148.0	OK	1
S1.005	S15	0.000	0.44		158.6	OK	
S5.000	S16	0.000	0.04		6.0	OK	
S5.001	S17	0.000	0.10		16.3	OK	
S5.002	S18	0.000	0.18		29.0	OK	
S1.006	S19	0.000	0.48		178.8	OK	
S1.007	S20	0.000	0.54		192.9	OK	2
S1.008	S21	0.000	0.09		191.4	OK	
S1.009	S22	0.000	0.63		190.4	OK*	
S6.000	S23	0.000	0.00		5.5	OK	
S6.001	S24	0.000	0.05		4.9	OK	
S1.010	S25	0.000	0.02		5.0	OK	
S7.000	S26	0.000	0.09		7.0	OK	
S8.000	SPP	0.000	0.34		20.8	OK	2
S8.001	SOR	0.000	0.10		9.4	OK	
S7.001	S27	0.000	0.14		32.6	OK	



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153 NET  
2 SWS.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S9.000	S28	15	Winter	1	+0%	100/15	Summer		92.757
S9.001	S29	15	Winter	1	+0%	100/15	Summer		92.581
S9.002	S30	15	Winter	1	+0%	100/15	Summer		92.482
S9.003	S31	15	Winter	1	+0%	100/15	Summer		92.320
S9.004	S33	15	Winter	1	+0%	100/15	Summer		91.703
S9.005	S34	15	Winter	1	+0%	100/15	Summer		91.190
S7.002	S35	15	Winter	1	+0%	100/15	Summer		90.785
S10.000	S36	15	Winter	1	+0%	100/15	Summer		92.199
S10.001	S37	15	Winter	1	+0%	100/15	Summer		91.393
S7.003	S38	15	Winter	1	+0%	30/15	Summer		90.500
S7.004	S39	15	Winter	1	+0%	30/15	Summer		90.394
S7.005	S40	15	Winter	1	+0%	30/15	Winter		90.124
S7.006	S41	15	Winter	1	+0%	30/15	Summer		90.077
S7.007	S42	1440	Winter	1	+0%	100/240	Summer		89.812
S11.000	S45	15	Winter	1	+0%	30/15	Summer		90.622
S11.001	S46	15	Winter	1	+0%	30/15	Summer	100/15 Summer	90.435
S11.002	S47	15	Winter	1	+0%	30/15	Summer		90.316
S11.003	S48	15	Winter	1	+0%	30/15	Summer		90.187
S11.004	S49	15	Winter	1	+0%	30/15	Summer		90.009
S12.000	S50	15	Winter	1	+0%	100/15	Summer	100/15 Summer	91.881
S12.001	S51	15	Winter	1	+0%	30/15	Summer	100/15 Summer	91.341
S12.002	S52	15	Winter	1	+0%	30/15	Summer	100/15 Winter	91.063
S13.000	S53	15	Winter	1	+0%	30/15	Summer	100/15 Summer	91.274
S13.001	S54	15	Winter	1	+0%	100/15	Summer		90.716
S13.002	S55	15	Winter	1	+0%	30/15	Winter		90.609
S13.003	S56	15	Winter	1	+0%	30/15	Summer		90.261
S13.004	S57	15	Winter	1	+0%	30/15	Summer	100/15 Summer	89.932
S13.005	S58	15	Winter	1	+0%	30/15	Summer		89.828
S13.006	S59	1440	Winter	1	+0%	30/15	Summer		89.812
S13.007	S60	1440	Winter	1	+0%	1/960	Summer		89.813
S14.000	S61	15	Winter	1	+0%	30/15	Summer	100/15 Summer	89.920
S7.008	S62	1440	Winter	1	+0%	1/240	Summer		89.812
S7.009	S63	15	Winter	1	+0%	30/1440	Winter		89.272
S7.010	S64	1440	Winter	1	+0%	30/960	Winter		89.199
S15.000	S65	1440	Winter	1	+0%	1/480	Winter		89.199
S1.011	S66	1440	Winter	1	+0%	1/360	Winter		89.199
S1.012	S67	1440	Winter	1	+0%				89.199
S1.013	S68	1440	Winter	1	+0%	1/120	Summer		89.198
S16.000	S69	15	Winter	1	+0%				89.391
S16.001	S70	15	Winter	1	+0%	100/15	Summer		88.840
S16.002	S71	15	Winter	1	+0%	30/30	Winter		88.429
S16.003	S72	60	Winter	1	+0%	30/15	Summer		88.416
S16.004	S73	60	Winter	1	+0%	30/15	Summer		88.412
S16.005	S74	60	Winter	1	+0%	30/15	Summer		88.409
S17.000	S75	15	Winter	1	+0%	30/15	Summer		88.566
S17.001	S76	15	Winter	1	+0%	30/15	Summer		88.455
S17.002	S77	60	Winter	1	+0%	30/15	Summer		88.425
S17.003	S78	60	Winter	1	+0%	30/15	Summer		88.417
S17.004	S79	60	Winter	1	+0%	30/15	Summer		88.410
S1.014	S80	60	Winter	1	+0%				88.405
S1.015	S81	60	Winter	1	+0%				88.404
S1.016	S82	120	Winter	1	+0%				88.239
S1.017	S83	120	Winter	1	+0%	1/120	Winter		88.054



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153 NET

2 SWS.SWS

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
S9.000	S28	-0.218	0.000	0.17		15.9	OK	
S9.001	S29	-0.212	0.000	0.18		15.7	OK	
S9.002	S30	-0.194	0.000	0.27		24.2	OK	
S9.003	S31	-0.182	0.000	0.32		33.7	OK	
S9.004	S33	-0.254	0.000	0.23		43.6	OK	
S9.005	S34	-0.307	0.000	0.22		58.9	OK	
S7.002	S35	-0.405	0.000	0.23		112.9	OK	
S10.000	S36	-0.201	0.000	0.23		26.3	OK	
S10.001	S37	-0.262	0.000	0.19		51.0	OK	
S7.003	S38	-0.296	0.000	0.51		176.5	OK	
S7.004	S39	-0.288	0.000	0.52		187.2	OK	
S7.005	S40	-0.320	0.000	0.33		197.6	OK	
S7.006	S41	0.000	0.000	1.13		196.6	OK	
S7.007	S42	-0.533	0.000	0.02		15.2	OK	
S11.000	S45	-0.148	0.000	0.25		10.0	OK	
S11.001	S46	-0.087	0.000	0.69		21.3	OK	2
S11.002	S47	-0.159	0.000	0.45		33.6	OK	
S11.003	S48	-0.199	0.000	0.44		46.5	OK	
S11.004	S49	-0.196	0.000	0.46		49.5	OK	
S12.000	S50	-0.144	0.000	0.27		13.1	OK	2
S12.001	S51	-0.174	0.000	0.36		29.3	OK	2
S12.002	S52	-0.155	0.000	0.47		39.6	OK	1
S13.000	S53	-0.076	0.000	0.48		10.4	OK	4
S13.001	S54	-0.134	0.000	0.34		14.5	OK	
S13.002	S55	-0.148	0.000	0.25		18.6	OK	
S13.003	S56	-0.196	0.000	0.26		28.3	OK	
S13.004	S57	-0.168	0.000	0.40		36.0	OK	4
S13.005	S58	-0.142	0.000	0.54		38.4	OK	
S13.006	S59	-0.007	0.000	0.04		2.9	OK	
S13.007	S60	0.100	0.000	0.05		3.1	SURCHARGED	
S14.000	S61	-0.030	0.000	0.97		15.8	OK	4
S7.008	S62	0.212	0.000	0.02		0.9	SURCHARGED	
S7.009	S63	-0.252	0.000	0.06		3.3	OK	
S7.010	S64	-0.282	0.000	0.01		2.1	OK	
S15.000	S65	0.144	0.000	0.03		0.9	SURCHARGED	
S1.011	S66	0.239	0.000	0.04		8.4	SURCHARGED	
S1.012	S67	-1.101	0.000	0.00		8.9	OK	
S1.013	S68	0.487	0.000	0.02		4.4	SURCHARGED	
S16.000	S69	-0.179	0.000	0.09		4.8	OK	
S16.001	S70	-0.401	0.000	0.03		10.2	OK	
S16.002	S71	-0.334	0.000	0.15		24.5	OK	
S16.003	S72	-0.185	0.000	0.12		20.1	OK	
S16.004	S73	-0.079	0.000	0.22		27.5	OK	
S16.005	S74	-0.051	0.000	0.20		29.0	OK	
S17.000	S75	-0.196	0.000	0.25		14.9	OK	
S17.001	S76	-0.155	0.000	0.44		22.8	OK	
S17.002	S77	-0.141	0.000	0.29		16.7	OK	
S17.003	S78	-0.061	0.000	0.33		17.6	OK	
S17.004	S79	-0.018	0.000	0.31		16.2	OK	
S1.014	S80	-1.195	0.000	0.01		44.2	OK	
S1.015	S81	-1.196	0.000	0.00		28.0	OK	
S1.016	S82	-1.081	0.000	0.00		17.1	OK	
S1.017	S83	0.003	0.000	0.26		14.2	SURCHARGED	





Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 2 SWS.SWS

Simulation Criteria

Areal Reduction Factor 1.000    Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0    MADD Factor \* 10m<sup>3</sup>/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 8    Number of Storage Structures 3    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 20.000    Cv (Summer) 0.750  
 Region England and Wales    Ratio R 0.405    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)    300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status    ON  
 DVD Status    OFF  
 Inertia Status    OFF

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		Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth
	Name	Storm							(m)	(m)
S1.000	S1	15 Winter	30	+0%	100/15 Summer	100/15 Winter			93.129	-0.121
S2.000	S2	15 Winter	30	+0%	30/15 Summer	100/15 Summer			93.224	0.085
S2.001	S3	15 Winter	30	+0%	30/15 Summer	100/15 Summer			93.159	0.162
S2.002	S4	15 Winter	30	+0%	30/15 Summer	100/15 Summer			93.038	0.133
S1.001	S5	15 Winter	30	+0%	100/15 Summer	100/15 Summer			92.591	-0.180
S3.000	S6	15 Winter	30	+0%	100/15 Summer	100/15 Summer			92.640	-0.060
S3.001	S7	15 Winter	30	+0%	30/15 Summer				92.601	0.082
S3.002	S8	15 Winter	30	+0%	30/15 Summer				92.539	0.131
S3.003	S9	15 Winter	30	+0%	30/15 Summer				92.496	0.163
S1.002	S10	15 Winter	30	+0%	30/15 Summer	100/15 Winter			92.461	0.185
S1.003	S11	15 Winter	30	+0%	30/15 Summer				92.326	0.098
S4.000	S12	15 Winter	30	+0%	100/15 Summer				92.340	-0.240
S4.001	S13	15 Winter	30	+0%	100/15 Summer				92.190	-0.215
S1.004	S14	15 Winter	30	+0%	100/15 Summer	100/15 Winter			91.968	-0.047
S1.005	S15	15 Winter	30	+0%	30/15 Winter				91.590	0.036
S5.000	S16	15 Winter	30	+0%	100/15 Summer				91.527	-0.298
S5.001	S17	15 Winter	30	+0%	100/15 Summer				91.415	-0.240
S5.002	S18	15 Winter	30	+0%	100/15 Summer				91.189	-0.086
S1.006	S19	15 Winter	30	+0%	30/15 Summer				91.171	0.080
S1.007	S20	15 Winter	30	+0%	30/15 Summer	100/15 Winter			90.514	0.060
S1.008	S21	15 Winter	30	+0%					89.913	-0.514
S1.009	S22	15 Winter	30	+0%	30/15 Summer				89.832	0.032
S6.000	S23	960 Winter	30	+0%					89.810	-1.090
S6.001	S24	960 Winter	30	+0%	30/15 Summer				89.810	0.302
S1.010	S25	960 Winter	30	+0%	30/240 Winter				89.794	0.113
S7.000	S26	15 Winter	30	+0%	100/15 Summer				91.995	-0.205
S8.000	SPP	30 Winter	30	+0%	30/15 Summer	100/30 Winter			93.114	0.164
S8.001	SOR	30 Winter	30	+0%	30/15 Summer				93.109	0.197
S7.001	S27	15 Winter	30	+0%	100/15 Summer				91.837	-0.220



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 2 SWS.SWS

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)	Flow (l/s)		
S1.000	S1	0.000	0.64		67.8	OK	1
S2.000	S2	0.000	0.67		25.8	SURCHARGED	2
S2.001	S3	0.000	1.13		41.9	SURCHARGED	4
S2.002	S4	0.000	1.42		54.6	SURCHARGED	4
S1.001	S5	0.000	0.52		143.6	OK	2
S3.000	S6	0.000	0.44		33.7	OK	2
S3.001	S7	0.000	0.76		57.3	SURCHARGED	
S3.002	S8	0.000	0.71		66.2	SURCHARGED	
S3.003	S9	0.000	0.74		73.7	SURCHARGED	
S1.002	S10	0.000	1.34		204.9	SURCHARGED	1
S1.003	S11	0.000	1.21		225.5	SURCHARGED	
S4.000	S12	0.000	0.27		36.3	OK	
S4.001	S13	0.000	0.37		73.0	OK	
S1.004	S14	0.000	0.96		347.7	OK	1
S1.005	S15	0.000	0.97		351.0	SURCHARGED	
S5.000	S16	0.000	0.09		14.8	OK	
S5.001	S17	0.000	0.27		46.0	OK	
S5.002	S18	0.000	0.52		84.8	OK	
S1.006	S19	0.000	1.01		376.5	SURCHARGED	
S1.007	S20	0.000	1.10		394.4	SURCHARGED	2
S1.008	S21	0.000	0.18		392.7	OK	
S1.009	S22	0.000	1.28		390.1	SURCHARGED*	
S6.000	S23	0.000	0.00		2.4	OK	
S6.001	S24	0.000	0.02		2.0	SURCHARGED	
S1.010	S25	0.000	0.02		5.0	SURCHARGED	
S7.000	S26	0.000	0.21		17.3	OK	
S8.000	SPP	0.000	0.68		41.9	FLOOD RISK	2
S8.001	SOR	0.000	0.15		13.9	FLOOD RISK	
S7.001	S27	0.000	0.35		80.5	OK	



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 2 SWS.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) SurchARGE	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S9.000	S28	15	Winter	30	+0%	100/15	Summer		92.809
S9.001	S29	15	Winter	30	+0%	100/15	Summer		92.637
S9.002	S30	15	Winter	30	+0%	100/15	Summer		92.567
S9.003	S31	15	Winter	30	+0%	100/15	Summer		92.427
S9.004	S33	15	Winter	30	+0%	100/15	Summer		91.802
S9.005	S34	15	Winter	30	+0%	100/15	Summer		91.307
S7.002	S35	15	Winter	30	+0%	100/15	Summer		91.136
S10.000	S36	15	Winter	30	+0%	100/15	Summer		92.265
S10.001	S37	15	Winter	30	+0%	100/15	Summer		91.476
S7.003	S38	15	Winter	30	+0%	30/15	Summer		91.011
S7.004	S39	15	Winter	30	+0%	30/15	Summer		90.834
S7.005	S40	15	Winter	30	+0%	30/15	Winter		90.467
S7.006	S41	1440	Winter	30	+0%	30/15	Summer		90.258
S7.007	S42	1440	Winter	30	+0%	100/240	Summer		90.258
S11.000	S45	15	Winter	30	+0%	30/15	Summer		90.810
S11.001	S46	15	Winter	30	+0%	30/15	Summer	100/15 Summer	90.730
S11.002	S47	15	Winter	30	+0%	30/15	Summer		90.588
S11.003	S48	15	Winter	30	+0%	30/15	Summer		90.475
S11.004	S49	1440	Winter	30	+0%	30/15	Summer		90.258
S12.000	S50	15	Winter	30	+0%	100/15	Summer	100/15 Summer	91.938
S12.001	S51	15	Winter	30	+0%	30/15	Summer	100/15 Summer	91.593
S12.002	S52	15	Winter	30	+0%	30/15	Summer	100/15 Winter	91.367
S13.000	S53	15	Winter	30	+0%	30/15	Summer	100/15 Summer	91.466
S13.001	S54	15	Winter	30	+0%	100/15	Summer		90.811
S13.002	S55	15	Winter	30	+0%	30/15	Winter		90.759
S13.003	S56	15	Winter	30	+0%	30/15	Summer		90.671
S13.004	S57	15	Winter	30	+0%	30/15	Summer	100/15 Summer	90.550
S13.005	S58	15	Winter	30	+0%	30/15	Summer		90.444
S13.006	S59	1440	Winter	30	+0%	30/15	Summer		90.258
S13.007	S60	1440	Winter	30	+0%	1/960	Summer		90.258
S14.000	S61	15	Winter	30	+0%	30/15	Summer	100/15 Summer	90.496
S7.008	S62	1440	Winter	30	+0%	1/240	Summer		90.258
S7.009	S63	1440	Winter	30	+0%	30/1440	Winter		89.547
S7.010	S64	1440	Winter	30	+0%	30/960	Winter		89.547
S15.000	S65	1440	Winter	30	+0%	1/480	Winter		89.547
S1.011	S66	1440	Winter	30	+0%	1/360	Winter		89.547
S1.012	S67	1440	Winter	30	+0%				89.546
S1.013	S68	1440	Winter	30	+0%	1/120	Summer		89.546
S16.000	S69	15	Winter	30	+0%				89.418
S16.001	S70	15	Winter	30	+0%	100/15	Summer		88.872
S16.002	S71	60	Winter	30	+0%	30/30	Winter		88.844
S16.003	S72	60	Winter	30	+0%	30/15	Summer		88.837
S16.004	S73	60	Winter	30	+0%	30/15	Summer		88.827
S16.005	S74	60	Winter	30	+0%	30/15	Summer		88.820
S17.000	S75	60	Winter	30	+0%	30/15	Summer		88.886
S17.001	S76	60	Winter	30	+0%	30/15	Summer		88.873
S17.002	S77	60	Winter	30	+0%	30/15	Summer		88.860
S17.003	S78	60	Winter	30	+0%	30/15	Summer		88.840
S17.004	S79	60	Winter	30	+0%	30/15	Summer		88.822
S1.014	S80	60	Winter	30	+0%				88.808
S1.015	S81	60	Winter	30	+0%				88.807
S1.016	S82	120	Winter	30	+0%				88.576
S1.017	S83	240	Winter	30	+0%	1/120	Winter		88.376



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 2 SWS.SWS

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
S9.000	S28	-0.166	0.000	0.41		39.0	OK	
S9.001	S29	-0.156	0.000	0.45		38.7	OK	
S9.002	S30	-0.109	0.000	0.71		63.5	OK	
S9.003	S31	-0.075	0.000	0.88		92.5	OK	
S9.004	S33	-0.155	0.000	0.63		122.0	OK	
S9.005	S34	-0.190	0.000	0.62		166.5	OK	
S7.002	S35	-0.054	0.000	0.56		278.3	OK	
S10.000	S36	-0.135	0.000	0.57		64.3	OK	
S10.001	S37	-0.179	0.000	0.52		136.9	OK	
S7.003	S38	0.215	0.000	1.23		427.8	SURCHARGED	
S7.004	S39	0.152	0.000	1.24		447.5	SURCHARGED	
S7.005	S40	0.023	0.000	0.78		471.8	SURCHARGED	
S7.006	S41	0.181	0.000	0.18		31.1	SURCHARGED	
S7.007	S42	-0.087	0.000	0.04		30.8	OK	
S11.000	S45	0.040	0.000	0.58		23.3	SURCHARGED	
S11.001	S46	0.208	0.000	1.73		53.4	SURCHARGED	2
S11.002	S47	0.114	0.000	1.17		86.7	SURCHARGED	
S11.003	S48	0.089	0.000	1.15		123.0	SURCHARGED	
S11.004	S49	0.053	0.000	0.06		6.8	SURCHARGED	
S12.000	S50	-0.087	0.000	0.66		32.1	OK	2
S12.001	S51	0.078	0.000	0.90		73.3	SURCHARGED	2
S12.002	S52	0.149	0.000	1.12		94.0	SURCHARGED	1
S13.000	S53	0.116	0.000	1.10		23.9	SURCHARGED	4
S13.001	S54	-0.039	0.000	0.81		34.6	OK	
S13.002	S55	0.002	0.000	0.63		46.7	SURCHARGED	
S13.003	S56	0.214	0.000	0.63		68.7	SURCHARGED	
S13.004	S57	0.450	0.000	0.91		82.0	SURCHARGED	4
S13.005	S58	0.474	0.000	1.23		87.4	SURCHARGED	
S13.006	S59	0.439	0.000	0.09		5.6	SURCHARGED	
S13.007	S60	0.545	0.000	0.11		6.4	SURCHARGED	
S14.000	S61	0.546	0.000	2.16		35.3	SURCHARGED	4
S7.008	S62	0.658	0.000	0.02		1.0	SURCHARGED	
S7.009	S63	0.023	0.000	0.02		1.3	SURCHARGED	
S7.010	S64	0.066	0.000	0.01		3.3	SURCHARGED	
S15.000	S65	0.492	0.000	0.07		1.9	SURCHARGED	
S1.011	S66	0.587	0.000	0.05		11.4	SURCHARGED	
S1.012	S67	-0.754	0.000	0.00		12.5	OK	
S1.013	S68	0.835	0.000	0.02		4.4	SURCHARGED	
S16.000	S69	-0.152	0.000	0.22		11.9	OK	
S16.001	S70	-0.369	0.000	0.07		28.5	OK	
S16.002	S71	0.081	0.000	0.20		33.2	SURCHARGED	
S16.003	S72	0.236	0.000	0.29		47.7	SURCHARGED	
S16.004	S73	0.336	0.000	0.57		72.7	SURCHARGED	
S16.005	S74	0.360	0.000	0.54		78.0	SURCHARGED	
S17.000	S75	0.124	0.000	0.29		17.6	SURCHARGED	
S17.001	S76	0.263	0.000	0.53		27.7	SURCHARGED	
S17.002	S77	0.294	0.000	0.61		34.9	SURCHARGED	
S17.003	S78	0.362	0.000	0.74		39.6	SURCHARGED	
S17.004	S79	0.394	0.000	0.74		38.9	SURCHARGED	
S1.014	S80	-0.792	0.000	0.01		115.1	OK	
S1.015	S81	-0.793	0.000	0.00		56.7	OK	
S1.016	S82	-0.744	0.000	0.00		23.9	OK	
S1.017	S83	0.325	0.000	0.26		14.5	SURCHARGED	



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 2 SWS.SWS

Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0      MADD Factor \* 10m<sup>3</sup>/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 8      Number of Storage Structures 3      Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model      FSR M5-60 (mm) 20.000      Cv (Summer) 0.750  
 Region England and Wales      Ratio R 0.405      Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)      300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status      ON  
 DVD Status      OFF  
 Inertia Status      OFF

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.	Water Level (m)
S1.000	S1	15 Winter	100	+40%	100/15 Summer	100/15 Winter			94.451
S2.000	S2	15 Winter	100	+40%	30/15 Summer	100/15 Summer			94.421
S2.001	S3	15 Winter	100	+40%	30/15 Summer	100/15 Summer			94.284
S2.002	S4	15 Winter	100	+40%	30/15 Summer	100/15 Summer			94.185
S1.001	S5	15 Winter	100	+40%	100/15 Summer	100/15 Summer			94.084
S3.000	S6	15 Winter	100	+40%	100/15 Summer	100/15 Summer			94.193
S3.001	S7	15 Winter	100	+40%	30/15 Summer				94.233
S3.002	S8	15 Winter	100	+40%	30/15 Summer				94.154
S3.003	S9	15 Winter	100	+40%	30/15 Summer				94.082
S1.002	S10	15 Winter	100	+40%	30/15 Summer	100/15 Winter			94.030
S1.003	S11	15 Winter	100	+40%	30/15 Summer				93.902
S4.000	S12	15 Winter	100	+40%	100/15 Summer				93.647
S4.001	S13	15 Winter	100	+40%	100/15 Summer				93.605
S1.004	S14	15 Winter	100	+40%	100/15 Summer	100/15 Winter			93.507
S1.005	S15	15 Winter	100	+40%	30/15 Winter				93.020
S5.000	S16	15 Winter	100	+40%	100/15 Summer				92.417
S5.001	S17	15 Winter	100	+40%	100/15 Summer				92.408
S5.002	S18	15 Winter	100	+40%	100/15 Summer				92.369
S1.006	S19	15 Winter	100	+40%	30/15 Summer				92.318
S1.007	S20	15 Winter	100	+40%	30/15 Summer	100/15 Winter			90.977
S1.008	S21	1440 Winter	100	+40%					90.280
S1.009	S22	1440 Winter	100	+40%	30/15 Summer				90.280
S6.000	S23	1440 Winter	100	+40%					90.289
S6.001	S24	1440 Winter	100	+40%	30/15 Summer				90.288
S1.010	S25	1440 Winter	100	+40%	30/240 Winter				90.279
S7.000	S26	15 Winter	100	+40%	100/15 Summer				92.821
S8.000	SPP	30 Winter	100	+40%	30/15 Summer	100/30 Winter			93.352
S8.001	SOR	30 Winter	100	+40%	30/15 Summer				93.347
S7.001	S27	15 Winter	100	+40%	100/15 Summer				92.795



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 2 SWS.SWS

PN	US/MH Name	Surcharged		Flooded		Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)			
S1.000	S1	1.201	0.915	0.93		98.1	FLOOD	1
S2.000	S2	1.282	0.585	0.98		38.0	FLOOD	2
S2.001	S3	1.287	3.814	1.45		53.5	FLOOD	4
S2.002	S4	1.280	5.222	2.28		87.4	FLOOD	4
S1.001	S5	1.313	4.447	0.59		163.6	FLOOD	2
S3.000	S6	1.493	3.504	0.65		50.7	FLOOD	2
S3.001	S7	1.714	0.000	1.06		80.2	FLOOD RISK	
S3.002	S8	1.746	0.000	0.93		87.1	FLOOD RISK	
S3.003	S9	1.749	0.000	0.89		89.4	FLOOD RISK	
S1.002	S10	1.754	0.042	1.55		238.4	FLOOD	1
S1.003	S11	1.674	0.000	1.36		253.0	FLOOD RISK	
S4.000	S12	1.067	0.000	0.43		57.0	FLOOD RISK	
S4.001	S13	1.200	0.000	0.47		94.1	FLOOD RISK	
S1.004	S14	1.492	7.472	1.21		438.0	FLOOD	1
S1.005	S15	1.466	0.000	1.30		474.0	SURCHARGED	
S5.000	S16	0.592	0.000	0.16		26.5	SURCHARGED	
S5.001	S17	0.753	0.000	0.48		80.2	SURCHARGED	
S5.002	S18	1.094	0.000	0.75		122.9	FLOOD RISK	
S1.006	S19	1.227	0.000	1.41		525.1	FLOOD RISK	
S1.007	S20	0.523	3.537	1.52		546.3	FLOOD	2
S1.008	S21	-0.146	0.000	0.02		53.0	FLOOD RISK	
S1.009	S22	0.480	0.000	0.17		53.0	FLOOD RISK*	
S6.000	S23	-0.611	0.000	0.00		5.2	OK	
S6.001	S24	0.780	0.000	0.02		1.6	FLOOD RISK	
S1.010	S25	0.598	0.000	0.02		5.0	FLOOD RISK	
S7.000	S26	0.621	0.000	0.35		28.5	SURCHARGED	
S8.000	SPP	0.402	2.180	1.28		78.4	FLOOD	2
S8.001	SOR	0.435	0.000	0.19		17.3	FLOOD RISK	
S7.001	S27	0.738	0.000	0.54		126.2	SURCHARGED	



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 2 SWS.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S9.000	S28	15 Winter	100	+40%	100/15 Summer				93.911
S9.001	S29	15 Winter	100	+40%	100/15 Summer				93.855
S9.002	S30	15 Winter	100	+40%	100/15 Summer				93.821
S9.003	S31	15 Winter	100	+40%	100/15 Summer				93.687
S9.004	S33	15 Winter	100	+40%	100/15 Summer				93.087
S9.005	S34	15 Winter	100	+40%	100/15 Summer				92.831
S7.002	S35	15 Winter	100	+40%	100/15 Summer				92.652
S10.000	S36	15 Winter	100	+40%	100/15 Summer				93.318
S10.001	S37	15 Winter	100	+40%	100/15 Summer				92.838
S7.003	S38	15 Winter	100	+40%	30/15 Summer				92.423
S7.004	S39	15 Winter	100	+40%	30/15 Summer				92.056
S7.005	S40	15 Winter	100	+40%	30/15 Winter				91.243
S7.006	S41	1440 Winter	100	+40%	30/15 Summer				90.823
S7.007	S42	1440 Winter	100	+40%	100/240 Summer				90.823
S11.000	S45	15 Winter	100	+40%	30/15 Summer				92.065
S11.001	S46	15 Winter	100	+40%	30/15 Summer	100/15 Summer			91.782
S11.002	S47	15 Winter	100	+40%	30/15 Summer				91.578
S11.003	S48	15 Winter	100	+40%	30/15 Summer				91.315
S11.004	S49	1440 Winter	100	+40%	30/15 Summer				90.823
S12.000	S50	15 Winter	100	+40%	100/15 Summer	100/15 Summer			93.252
S12.001	S51	15 Winter	100	+40%	30/15 Summer	100/15 Summer			92.951
S12.002	S52	15 Winter	100	+40%	30/15 Summer	100/15 Winter			92.550
S13.000	S53	15 Winter	100	+40%	30/15 Summer	100/15 Summer			92.633
S13.001	S54	15 Winter	100	+40%	100/15 Summer				92.003
S13.002	S55	15 Winter	100	+40%	30/15 Winter				91.910
S13.003	S56	15 Winter	100	+40%	30/15 Summer				91.701
S13.004	S57	15 Winter	100	+40%	30/15 Summer	100/15 Summer			91.355
S13.005	S58	15 Winter	100	+40%	30/15 Summer				91.224
S13.006	S59	15 Winter	100	+40%	30/15 Summer				90.869
S13.007	S60	1440 Winter	100	+40%	1/960 Summer				90.823
S14.000	S61	15 Winter	100	+40%	30/15 Summer	100/15 Summer			91.202
S7.008	S62	1440 Winter	100	+40%	1/240 Summer				90.823
S7.009	S63	1440 Winter	100	+40%	30/1440 Winter				89.963
S7.010	S64	1440 Winter	100	+40%	30/960 Winter				89.962
S15.000	S65	1440 Winter	100	+40%	1/480 Winter				89.962
S1.011	S66	1440 Winter	100	+40%	1/360 Winter				89.962
S1.012	S67	1440 Winter	100	+40%					89.962
S1.013	S68	1440 Winter	100	+40%	1/120 Summer				89.962
S16.000	S69	15 Winter	100	+40%					89.446
S16.001	S70	60 Winter	100	+40%	100/15 Summer				89.414
S16.002	S71	60 Winter	100	+40%	30/30 Winter				89.411
S16.003	S72	60 Winter	100	+40%	30/15 Summer				89.399
S16.004	S73	60 Winter	100	+40%	30/15 Summer				89.382
S16.005	S74	60 Winter	100	+40%	30/15 Summer				89.370
S17.000	S75	15 Winter	100	+40%	30/15 Summer				89.900
S17.001	S76	15 Winter	100	+40%	30/15 Summer				89.783
S17.002	S77	15 Winter	100	+40%	30/15 Summer				89.670
S17.003	S78	30 Winter	100	+40%	30/15 Summer				89.430
S17.004	S79	60 Winter	100	+40%	30/15 Summer				89.375
S1.014	S80	60 Winter	100	+40%					89.350
S1.015	S81	60 Winter	100	+40%					89.349
S1.016	S82	240 Winter	100	+40%					89.001
S1.017	S83	480 Winter	100	+40%	1/120 Winter				88.817



Date 30/03/2021 08:36

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 2 SWS.SWS

PN	US/MH Name	Surcharged		Flooded		Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)			
S9.000	S28	0.936	0.000	0.60		57.2	SURCHARGED	
S9.001	S29	1.062	0.000	0.64		54.8	SURCHARGED	
S9.002	S30	1.145	0.000	0.91		81.9	FLOOD RISK	
S9.003	S31	1.185	0.000	1.17		122.1	FLOOD RISK	
S9.004	S33	1.130	0.000	0.78		151.2	SURCHARGED	
S9.005	S34	1.334	0.000	0.75		203.7	FLOOD RISK	
S7.002	S35	1.462	0.000	0.75		373.4	FLOOD RISK	
S10.000	S36	0.918	0.000	0.86		97.1	SURCHARGED	
S10.001	S37	1.183	0.000	0.69		181.5	FLOOD RISK	
S7.003	S38	1.627	0.000	1.75		607.1	FLOOD RISK	
S7.004	S39	1.374	0.000	1.82		655.6	SURCHARGED	
S7.005	S40	0.799	0.000	1.19		724.0	SURCHARGED	
S7.006	S41	0.746	0.000	0.31		53.6	SURCHARGED	
S7.007	S42	0.478	0.000	0.07		53.5	SURCHARGED	
S11.000	S45	1.295	0.000	1.00		40.0	FLOOD RISK	
S11.001	S46	1.260	2.322	2.95		91.1	FLOOD	2
S11.002	S47	1.104	0.000	1.72		127.9	FLOOD RISK	
S11.003	S48	0.929	0.000	1.79		191.2	FLOOD RISK	
S11.004	S49	0.618	0.000	0.11		11.3	SURCHARGED	
S12.000	S50	1.227	1.790	1.07		51.9	FLOOD	2
S12.001	S51	1.436	1.109	1.32		107.3	FLOOD	2
S12.002	S52	1.332	0.018	1.74		146.9	FLOOD	1
S13.000	S53	1.283	2.082	1.45		31.6	FLOOD	4
S13.001	S54	1.153	0.000	1.03		44.2	FLOOD RISK	
S13.002	S55	1.153	0.000	0.82		60.9	FLOOD RISK	
S13.003	S56	1.244	0.000	0.93		101.6	FLOOD RISK	
S13.004	S57	1.255	5.101	1.34		120.9	FLOOD	4
S13.005	S58	1.254	0.000	1.78		126.7	FLOOD RISK	
S13.006	S59	1.050	0.000	2.19		141.5	SURCHARGED	
S13.007	S60	1.110	0.000	0.20		11.4	FLOOD RISK	
S14.000	S61	1.252	2.491	3.13		51.0	FLOOD	4
S7.008	S62	1.223	0.000	0.02		1.1	SURCHARGED	
S7.009	S63	0.439	0.000	0.03		1.7	SURCHARGED	
S7.010	S64	0.481	0.000	0.02		5.2	SURCHARGED	
S15.000	S65	0.907	0.000	0.12		3.3	FLOOD RISK	
S1.011	S66	1.002	0.000	0.07		15.0	FLOOD RISK	
S1.012	S67	-0.338	0.000	0.00		18.2	OK	
S1.013	S68	1.251	0.000	0.02		5.0	FLOOD RISK	
S16.000	S69	-0.124	0.000	0.41		21.6	OK	
S16.001	S70	0.173	0.000	0.06		23.4	SURCHARGED	
S16.002	S71	0.648	0.000	0.35		58.9	SURCHARGED	
S16.003	S72	0.798	0.000	0.60		96.9	SURCHARGED	
S16.004	S73	0.891	0.000	1.16		147.0	SURCHARGED	
S16.005	S74	0.910	0.000	1.09		158.4	FLOOD RISK	
S17.000	S75	1.138	0.000	0.92		55.2	FLOOD RISK	
S17.001	S76	1.173	0.000	1.69		88.3	FLOOD RISK	
S17.002	S77	1.104	0.000	1.93		110.7	FLOOD RISK	
S17.003	S78	0.952	0.000	1.99		106.6	FLOOD RISK	
S17.004	S79	0.947	0.000	1.46		76.6	FLOOD RISK	
S1.014	S80	-0.250	0.000	0.03		229.3	FLOOD RISK	
S1.015	S81	-0.251	0.000	0.01		82.3	FLOOD RISK*	
S1.016	S82	-0.319	0.000	0.00		27.6	OK	
S1.017	S83	0.766	0.000	0.26		14.5	FLOOD RISK	





Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for 16153 NET 3 SWS.SWS

Pipe Sizes SWS NET 2 Manhole Sizes SWS NET 2

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.405	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
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 16153 NET 3 SWS.SWS

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
S1.000	11.545	0.077	149.9	0.070	5.00	0.0	0.600		o	225	Pipe/Conduit	
S1.001	17.588	0.155	113.5	0.043	0.00	0.0	0.600		o	225	Pipe/Conduit	
S1.002	8.501	0.057	149.1	0.026	0.00	0.0	0.600		o	225	Pipe/Conduit	
S2.000	45.459	0.152	299.1	0.127	5.00	0.0	0.600		o	300	Pipe/Conduit	
S2.001	52.524	0.349	150.5	0.118	0.00	0.0	0.600		o	375	Pipe/Conduit	
S2.002	11.029	0.037	298.1	0.081	0.00	0.0	0.600		o	375	Pipe/Conduit	
S2.003	4.896	0.016	306.0	0.070	0.00	0.0	0.600		o	375	Pipe/Conduit	
S2.004	45.253	0.151	299.7	0.057	0.00	0.0	0.600		o	375	Pipe/Conduit	
S3.000	15.718	0.400	39.3	0.110	5.00	0.0	0.600		o	225	Pipe/Conduit	
S3.001	33.058	0.639	51.7	0.058	0.00	0.0	0.600		o	225	Pipe/Conduit	
S3.002	14.925	0.100	149.3	0.048	0.00	0.0	0.600		o	300	Pipe/Conduit	
S3.003	28.507	0.190	150.0	0.038	0.00	0.0	0.600		o	300	Pipe/Conduit	
S2.005	43.220	0.086	502.6	0.091	0.00	0.0	0.600		o	600	Pipe/Conduit	
S2.006	19.536	0.040	488.4	0.078	0.00	0.0	0.600		o	600	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	5.18	85.954	0.070	0.0	0.0	0.0	1.07	42.4	9.5
S1.001	50.00	5.42	85.877	0.113	0.0	0.0	0.0	1.23	48.8	15.4
S1.002	50.00	5.55	85.722	0.139	0.0	0.0	0.0	1.07	42.5	18.9
S2.000	50.00	5.84	86.951	0.127	0.0	0.0	0.0	0.90	63.9	17.2
S2.001	50.00	6.43	86.724	0.245	0.0	0.0	0.0	1.47	162.9	33.2
S2.002	50.00	6.61	86.375	0.326	0.0	0.0	0.0	1.04	115.3	44.1
S2.003	50.00	6.69	86.338	0.396	0.0	0.0	0.0	1.03	113.8	53.7
S2.004	50.00	7.41	86.322	0.453	0.0	0.0	0.0	1.04	115.0	61.3
S3.000	50.00	5.13	87.650	0.110	0.0	0.0	0.0	2.09	83.2	14.8
S3.001	50.00	5.43	87.250	0.168	0.0	0.0	0.0	1.82	72.5	22.8
S3.002	50.00	5.62	86.536	0.216	0.0	0.0	0.0	1.28	90.8	29.3
S3.003	50.00	5.99	86.436	0.254	0.0	0.0	0.0	1.28	90.6	34.5
S2.005	50.00	8.08	85.946	0.798	0.0	0.0	0.0	1.08	305.2	108.1
S2.006	50.00	8.38	85.860	0.877	0.0	0.0	0.0	1.10	309.6	118.7



Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Network Design Table for 16153 NET 3 SWS.SWS

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
S4.000	54.669	0.547	99.9	0.078	5.00	0.0		0.045	4 \=/	1000	1:4 Swale	
S4.001	14.686	0.117	125.5	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S4.002	56.161	1.063	52.8	0.219	0.00	0.0	0.600		o	225	Pipe/Conduit	
S2.007	13.834	0.032	426.6	0.104	0.00	0.0	0.600		o	600	Pipe/Conduit	
S5.000	21.155	0.208	101.7	0.098	5.00	0.0	0.600		o	225	Pipe/Conduit	
S5.001	14.511	0.172	84.1	0.044	0.00	0.0	0.600		o	225	Pipe/Conduit	
S5.002	22.543	0.134	168.2	0.027	0.00	0.0	0.600		o	225	Pipe/Conduit	
S5.003	12.824	0.076	168.2	0.015	0.00	0.0	0.600		o	225	Pipe/Conduit	
S5.004	34.651	0.116	300.0	0.071	0.00	0.0		0.045	4 \=/	600	1:4 Swale	
S5.005	19.251	0.227	84.8	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S2.008	14.057	0.028	500.0	0.027	0.00	0.0	0.600		o	600	Pipe/Conduit	
S2.009	51.245	0.102	500.0	0.047	0.00	0.0	0.600		o	600	Pipe/Conduit	
S6.000	27.755	0.165	168.2	0.216	5.00	0.0	0.600		o	300	Pipe/Conduit	
S2.010	59.064	0.118	500.5	0.050	0.00	0.0	0.600		o	600	Pipe/Conduit	
S2.011	4.780	0.010	478.0	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit	
S2.012	32.425	0.108	300.2	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S1.003	59.034	0.118	500.0	0.115	0.00	0.0		0.045	4 \=/	2000	1:4 Swale	
S1.004	8.359	0.050	167.2	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)
S4.000	50.00	6.82	88.300	0.078	0.0	0.0	0.0	0.50	120.5	10.5
S4.001	50.00	7.03	87.375	0.078	0.0	0.0	0.0	1.17	46.3	10.5
S4.002	50.00	7.54	87.258	0.297	0.0	0.0	0.0	1.80	71.7	40.3
S2.007	50.00	8.57	85.820	1.278	0.0	0.0	0.0	1.17	331.6	173.0
S5.000	50.00	5.27	87.170	0.098	0.0	0.0	0.0	1.30	51.5	13.3
S5.001	50.00	5.44	86.962	0.142	0.0	0.0	0.0	1.43	56.7	19.3
S5.002	50.00	5.82	86.790	0.169	0.0	0.0	0.0	1.01	40.0	22.9
S5.003	50.00	6.03	86.655	0.184	0.0	0.0	0.0	1.01	40.0	24.9
S5.004	50.00	8.15	86.579	0.255	0.0	0.0	0.0	0.27	49.1	34.6
S5.005	50.00	8.37	86.389	0.255	0.0	0.0	0.0	1.42	56.5	34.6
S2.008	50.00	8.79	85.787	1.560	0.0	0.0	0.0	1.08	306.0	211.2
S2.009	50.00	9.58	85.759	1.607	0.0	0.0	0.0	1.08	306.0	217.6
S6.000	50.00	5.38	85.822	0.216	0.0	0.0	0.0	1.21	85.5	29.2
S2.010	50.00	10.49	85.657	1.872	0.0	0.0	0.0	1.08	305.8	253.5
S2.011	50.00	5.18	85.539	0.000	4.0	0.0	0.0	0.45	8.0	4.0
S2.012	50.00	5.77	85.529	0.000	4.0	0.0	0.0	0.90	63.8	4.0
S1.003	50.00	9.83	85.421	0.254	4.0	0.0	0.0	0.24	94.5	38.4
S1.004	50.00	9.97	85.303	0.254	4.0	0.0	0.0	1.01	40.1	38.4



Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Online Controls for 16153 NET 3 SWS.SWS

Orifice Manhole: S10, DS/PN: S4.001, Volume (m<sup>3</sup>): 110.7

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 87.375

Hydro-Brake® Optimum Manhole: S13, DS/PN: S5.005, Volume (m<sup>3</sup>): 432.8

Unit Reference MD-SHE-0050-1500-1800-1500  
 Design Head (m) 1.800  
 Design Flow (l/s) 1.5  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 50  
 Invert Level (m) 86.389  
 Minimum Outlet Pipe Diameter (mm) 75  
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.800	1.5	Kick-Flo®	0.450	0.8
Flush-Flo™	0.224	1.0	Mean Flow over Head Range	-	1.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.9	0.800	1.0	2.000	1.6	4.000	2.2	7.000	2.8
0.200	1.0	1.000	1.1	2.200	1.6	4.500	2.3	7.500	2.9
0.300	1.0	1.200	1.2	2.400	1.7	5.000	2.4	8.000	3.0
0.400	0.9	1.400	1.3	2.600	1.8	5.500	2.5	8.500	3.1
0.500	0.8	1.600	1.4	3.000	1.9	6.000	2.6	9.000	3.1
0.600	0.9	1.800	1.5	3.500	2.0	6.500	2.7	9.500	3.2

Hydro-Brake® Optimum Manhole: S17, DS/PN: S2.011, Volume (m<sup>3</sup>): 19.3

Unit Reference MD-SHE-0090-4000-1300-4000  
 Design Head (m) 1.300  
 Design Flow (l/s) 4.0  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 90  
 Invert Level (m) 85.539  
 Minimum Outlet Pipe Diameter (mm) 150  
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	4.0	Kick-Flo®	0.796	3.2
Flush-Flo™	0.388	4.0	Mean Flow over Head Range	-	3.5

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



Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Hydro-Brake® Optimum Manhole: S17, DS/PN: S2.011, Volume (m³): 19.3

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	2.8	0.800	3.2	2.000	4.9	4.000	6.8	7.000	8.8
0.200	3.7	1.000	3.5	2.200	5.1	4.500	7.1	7.500	9.1
0.300	3.9	1.200	3.9	2.400	5.3	5.000	7.5	8.000	9.4
0.400	4.0	1.400	4.1	2.600	5.5	5.500	7.9	8.500	9.7
0.500	3.9	1.600	4.4	3.000	5.9	6.000	8.2	9.000	9.9
0.600	3.8	1.800	4.7	3.500	6.3	6.500	8.5	9.500	10.2

Hydro-Brake® Optimum Manhole: S31, DS/PN: S1.004, Volume (m³): 635.2

Unit Reference MD-SHE-0095-4000-1000-4000  
 Design Head (m) 1.000  
 Design Flow (l/s) 4.0  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 95  
 Invert Level (m) 85.303  
 Minimum Outlet Pipe Diameter (mm) 150  
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	4.0	Kick-Flo®	0.629	3.2
Flush-Flo™	0.294	4.0	Mean Flow over Head Range	-	3.5

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)	Depth (m)	Flow (l/s)
0.100	3.0	0.800	3.6	2.000	5.5	4.000	7.6	7.000	10.0
0.200	3.9	1.000	4.0	2.200	5.8	4.500	8.1	7.500	10.3
0.300	4.0	1.200	4.3	2.400	6.0	5.000	8.5	8.000	10.6
0.400	3.9	1.400	4.7	2.600	6.2	5.500	8.9	8.500	10.9
0.500	3.8	1.600	5.0	3.000	6.7	6.000	9.3	9.000	11.2
0.600	3.4	1.800	5.3	3.500	7.2	6.500	9.6	9.500	11.5

.  
.  
.

Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Storage Structures for 16153 NET 3 SWS.SWSTank or Pond Manhole: S17, DS/PN: S2.011

Invert Level (m) 85.539

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	734.0	1.600	1809.0



Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153 NET  
3 SWS.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/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 4 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750  
 Region England and Wales Ratio R 0.405 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status ON  
 DVD Status OFF  
 Inertia Status OFF

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.	Water Level (m)
S1.000	S21	15 Winter	1	+0%	100/15 Summer				86.034
S1.001	S22	15 Winter	1	+0%	30/15 Winter				85.968
S1.002	S23	15 Winter	1	+0%	30/15 Summer				85.840
S2.000	S1	15 Winter	1	+0%	100/15 Summer				87.063
S2.001	S2	15 Winter	1	+0%	100/15 Summer				86.839
S2.002	S3	15 Winter	1	+0%	30/15 Summer	100/15 Summer			86.575
S2.003	S4	15 Winter	1	+0%	30/15 Summer	100/15 Summer			86.550
S2.004	S5	15 Winter	1	+0%	30/15 Summer				86.510
S3.000	S7	15 Winter	1	+0%	100/15 Summer				87.720
S3.001	S8	15 Winter	1	+0%	100/15 Summer				87.339
S3.002	S9	15 Winter	1	+0%	30/15 Winter				86.662
S3.003	S8	15 Winter	1	+0%	30/15 Winter	100/15 Summer			86.566
S2.005	S13	15 Winter	1	+0%	30/15 Summer	100/15 Winter			86.278
S2.006	S14	15 Winter	1	+0%	30/15 Summer				86.242
S4.000	SSwale 1	15 Winter	1	+0%					88.340
S4.001	S10	15 Winter	1	+0%	1/15 Summer				87.679
S4.002	S9	15 Winter	1	+0%	30/15 Summer	100/15 Summer			87.373
S2.007	S10	15 Winter	1	+0%	30/15 Summer				86.220
S5.000	S16	15 Winter	1	+0%	30/15 Summer	100/15 Winter			87.253
S5.001	S17	15 Winter	1	+0%	30/15 Summer	100/15 Winter			87.059
S5.002	S18	240 Winter	1	+0%	30/15 Summer				86.992
S5.003	S19	240 Winter	1	+0%	1/30 Summer				86.991
S5.004	SSwale 2	240 Winter	1	+0%					86.989
S5.005	S13	240 Winter	1	+0%	1/15 Summer				86.989
S2.008	S14	15 Winter	1	+0%	30/15 Summer				86.187
S2.009	S15	15 Winter	1	+0%	30/15 Summer				86.070
S6.000	S24	30 Winter	1	+0%	30/15 Summer				85.970
S2.010	SBasin	15 Winter	1	+0%	30/15 Summer				85.960
S2.011	S17	1440 Winter	1	+0%	1/30 Summer				85.871



Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153 NET  
3 SWS.SWS

PN	US/MH Name	Surcharged		Flooded		Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)			
S1.000	S21	-0.145	0.000	0.27		9.8	OK	
S1.001	S22	-0.134	0.000	0.34		14.8	OK	
S1.002	S23	-0.107	0.000	0.54		18.0	OK	
S2.000	S1	-0.188	0.000	0.29		17.3	OK	
S2.001	S2	-0.260	0.000	0.20		30.4	OK	
S2.002	S3	-0.175	0.000	0.45		39.3	OK	4
S2.003	S4	-0.163	0.000	0.61		46.9	OK	4
S2.004	S5	-0.187	0.000	0.49		52.0	OK	
S3.000	S7	-0.155	0.000	0.21		15.3	OK	
S3.001	S8	-0.136	0.000	0.32		22.0	OK	
S3.002	S9	-0.174	0.000	0.37		27.9	OK	
S3.003	S8	-0.170	0.000	0.39		32.2	OK	4
S2.005	S13	-0.268	0.000	0.33		87.6	OK	1
S2.006	S14	-0.218	0.000	0.43		89.2	OK	
S4.000	SSwale 1	-0.560	0.000	0.01		11.0	OK	
S4.001	S10	0.079	0.000	0.26		10.5	SURCHARGED	
S4.002	S9	-0.110	0.000	0.51		35.1	OK	3
S2.007	S10	-0.200	0.000	0.65		125.4	OK	
S5.000	S16	-0.142	0.000	0.29		13.5	OK	1
S5.001	S17	-0.128	0.000	0.38		18.8	OK	1
S5.002	S18	-0.023	0.000	0.13		4.7	OK	
S5.003	S19	0.110	0.000	0.14		4.8	SURCHARGED	
S5.004	SSwale 2	-1.311	0.000	0.00		6.6	OK	
S5.005	S13	0.376	0.000	0.02		1.0	SURCHARGED	
S2.008	S14	-0.199	0.000	0.78		127.6	OK	
S2.009	S15	-0.289	0.000	0.48		128.3	OK	
S6.000	S24	-0.152	0.000	0.30		22.8	OK	
S2.010	SBasin	-0.297	0.000	0.50		137.7	OK	
S2.011	S17	0.182	0.000	0.41		3.8	SURCHARGED	



Date 30/03/2021 08:32  
File 16153 - ALL NETWORKS.MDX

Designed by OliviaDent  
Checked by

Innovyze

Network 2018.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153 NET  
3 SWS.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S2.012	S30	1440 Winter	1	+0%	30/360 Winter				85.644	-0.185
S1.003	Sswale 3	1440 Winter	1	+0%					85.639	-1.206
S1.004	S31	1440 Winter	1	+0%	1/30 Winter				85.639	0.111

PN	US/MH Name	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S2.012	S30	0.000	0.07	3.8	OK	
S1.003	Sswale 3	0.000	0.00	5.5	OK	
S1.004	S31	0.000	0.13	4.0	SURCHARGED	





Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 3 SWS.SWS

Simulation Criteria

Areal Reduction Factor 1.000    Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0    MADD Factor \* 10m<sup>3</sup>/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 4    Number of Storage Structures 1    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 20.000    Cv (Summer) 0.750  
 Region England and Wales    Ratio R 0.405    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)    300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status    ON  
 DVD Status    OFF  
 Inertia Status    OFF

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.	Water Level (m)
S1.000	S21	15 Winter	30	+0%	100/15 Summer				86.144
S1.001	S22	15 Winter	30	+0%	30/15 Winter				86.109
S1.002	S23	15 Winter	30	+0%	30/15 Summer				85.989
S2.000	S1	15 Winter	30	+0%	100/15 Summer				87.144
S2.001	S2	15 Winter	30	+0%	100/15 Summer				86.980
S2.002	S3	15 Winter	30	+0%	30/15 Summer	100/15 Summer			86.908
S2.003	S4	15 Winter	30	+0%	30/15 Summer	100/15 Summer			86.871
S2.004	S5	15 Winter	30	+0%	30/15 Summer				86.831
S3.000	S7	15 Winter	30	+0%	100/15 Summer				87.765
S3.001	S8	15 Winter	30	+0%	100/15 Summer				87.413
S3.002	S9	15 Winter	30	+0%	30/15 Winter				86.839
S3.003	S8	15 Winter	30	+0%	30/15 Winter	100/15 Summer			86.763
S2.005	S13	15 Winter	30	+0%	30/15 Summer	100/15 Winter			86.652
S2.006	S14	15 Winter	30	+0%	30/15 Summer				86.603
S4.000	SSwale 1	15 Winter	30	+0%					88.366
S4.001	S10	15 Winter	30	+0%	1/15 Summer				87.988
S4.002	S9	15 Winter	30	+0%	30/15 Summer	100/15 Summer			87.827
S2.007	S10	15 Winter	30	+0%	30/15 Summer				86.562
S5.000	S16	15 Winter	30	+0%	30/15 Summer	100/15 Winter			87.505
S5.001	S17	15 Winter	30	+0%	30/15 Summer	100/15 Winter			87.426
S5.002	S18	15 Winter	30	+0%	30/15 Summer				87.311
S5.003	S19	480 Winter	30	+0%	1/30 Summer				87.303
S5.004	SSwale 2	480 Winter	30	+0%					87.302
S5.005	S13	480 Winter	30	+0%	1/15 Summer				87.301
S2.008	S14	15 Winter	30	+0%	30/15 Summer				86.509
S2.009	S15	15 Winter	30	+0%	30/15 Summer				86.451
S6.000	S24	15 Winter	30	+0%	30/15 Summer				86.375
S2.010	SBasin	15 Winter	30	+0%	30/15 Summer				86.313
S2.011	S17	1440 Winter	30	+0%	1/30 Summer				86.233



Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 3 SWS.SWS

PN	US/MH Name	Surcharged		Flooded	Pipe		Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)	Flow (l/s)		
S1.000	S21	-0.035	0.000	0.65		23.6	OK	
S1.001	S22	0.007	0.000	0.87		37.8	SURCHARGED	
S1.002	S23	0.042	0.000	1.38		46.3	SURCHARGED	
S2.000	S1	-0.107	0.000	0.71		42.2	OK	
S2.001	S2	-0.119	0.000	0.51		76.8	OK	
S2.002	S3	0.158	0.000	1.04		90.7	SURCHARGED	4
S2.003	S4	0.158	0.000	1.41		109.0	SURCHARGED	4
S2.004	S5	0.134	0.000	1.15		121.9	SURCHARGED	
S3.000	S7	-0.110	0.000	0.51		37.6	OK	
S3.001	S8	-0.062	0.000	0.85		58.1	OK	
S3.002	S9	0.003	0.000	0.95		72.1	SURCHARGED	
S3.003	S8	0.027	0.000	1.01		82.4	SURCHARGED	4
S2.005	S13	0.106	0.000	0.79		208.6	SURCHARGED	1
S2.006	S14	0.143	0.000	1.05		217.9	SURCHARGED	
S4.000	SSwale 1	-0.534	0.000	0.01		26.0	OK	
S4.001	S10	0.388	0.000	0.38		15.6	SURCHARGED	
S4.002	S9	0.344	0.000	1.13		78.0	SURCHARGED	3
S2.007	S10	0.142	0.000	1.61		309.9	SURCHARGED	
S5.000	S16	0.110	0.000	0.63		29.7	SURCHARGED	1
S5.001	S17	0.239	0.000	0.81		40.0	SURCHARGED	1
S5.002	S18	0.296	0.000	1.27		46.6	SURCHARGED	
S5.003	S19	0.422	0.000	0.19		6.5	SURCHARGED	
S5.004	SSwale 2	-0.999	0.000	0.00		9.0	OK	
S5.005	S13	0.688	0.000	0.02		1.1	SURCHARGED	
S2.008	S14	0.122	0.000	1.88		308.6	SURCHARGED	
S2.009	S15	0.093	0.000	1.15		308.1	SURCHARGED	
S6.000	S24	0.253	0.000	0.87		66.9	SURCHARGED	
S2.010	SBasin	0.056	0.000	1.26		342.8	SURCHARGED	
S2.011	S17	0.544	0.000	0.43		3.9	SURCHARGED	

.  
.  
.

Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 3 SWS.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S2.012	S30	1440	Winter	30	+0%	30/360	Winter		85.993	0.164
S1.003	Sswale 3	1440	Winter	30	+0%				85.988	-0.857
S1.004	S31	1440	Winter	30	+0%	1/30	Winter		85.988	0.460

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Flow (l/s)			
S2.012	S30	0.000	0.07	4.0		SURCHARGED	
S1.003	Sswale 3	0.000	0.00	7.7		OK	
S1.004	S31	0.000	0.13	4.0		SURCHARGED	



Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 3 SWS.SWS

Simulation Criteria

Areal Reduction Factor 1.000    Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0    MADD Factor \* 10m<sup>3</sup>/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 4    Number of Storage Structures 1    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 20.000    Cv (Summer) 0.750  
 Region England and Wales    Ratio R 0.405    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)    300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status    ON  
 DVD Status    OFF  
 Inertia Status    OFF

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.	Water Level (m)
S1.000	S21	15 Winter	100	+40%	100/15 Summer				86.670
S1.001	S22	15 Winter	100	+40%	30/15 Winter				86.569
S1.002	S23	1440 Winter	100	+40%	30/15 Summer				86.230
S2.000	S1	15 Winter	100	+40%	100/15 Summer				88.505
S2.001	S2	15 Winter	100	+40%	100/15 Summer				88.277
S2.002	S3	15 Winter	100	+40%	30/15 Summer	100/15 Summer			88.018
S2.003	S4	15 Winter	100	+40%	30/15 Summer	100/15 Summer			87.909
S2.004	S5	15 Summer	100	+40%	30/15 Summer				87.801
S3.000	S7	15 Winter	100	+40%	100/15 Summer				88.908
S3.001	S8	15 Winter	100	+40%	100/15 Summer				88.696
S3.002	S9	15 Winter	100	+40%	30/15 Winter				87.851
S3.003	S8	15 Winter	100	+40%	30/15 Winter	100/15 Summer			87.671
S2.005	S13	15 Winter	100	+40%	30/15 Summer	100/15 Winter			87.451
S2.006	S14	15 Winter	100	+40%	30/15 Summer				87.404
S4.000	SSwale 1	15 Winter	100	+40%					88.391
S4.001	S10	15 Winter	100	+40%	1/15 Summer				88.217
S4.002	S9	15 Winter	100	+40%	30/15 Summer	100/15 Summer			88.650
S2.007	S10	15 Winter	100	+40%	30/15 Summer				87.332
S5.000	S16	15 Winter	100	+40%	30/15 Summer	100/15 Winter			88.596
S5.001	S17	15 Winter	100	+40%	30/15 Summer	100/15 Winter			88.387
S5.002	S18	15 Winter	100	+40%	30/15 Summer				88.115
S5.003	S19	960 Winter	100	+40%	1/30 Summer				87.646
S5.004	SSwale 2	960 Winter	100	+40%					87.644
S5.005	S13	960 Winter	100	+40%	1/15 Summer				87.644
S2.008	S14	15 Winter	100	+40%	30/15 Summer				87.130
S2.009	S15	15 Winter	100	+40%	30/15 Summer				86.942
S6.000	S24	15 Winter	100	+40%	30/15 Summer				87.008
S2.010	SBasin	1440 Winter	100	+40%	30/15 Summer				86.714
S2.011	S17	1440 Winter	100	+40%	1/30 Summer				86.713



Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 3 SWS.SWS

PN	US/MH Name	Surcharged		Flooded		Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	Overflow (l/s)			
S1.000	S21	0.491	0.000	1.15		41.5	SURCHARGED	
S1.001	S22	0.467	0.000	1.51		65.9	SURCHARGED	
S1.002	S23	0.283	0.000	0.11		3.9	SURCHARGED	
S2.000	S1	1.254	0.000	1.12		67.3	SURCHARGED	
S2.001	S2	1.178	0.000	0.80		121.0	FLOOD RISK	
S2.002	S3	1.268	3.634	1.50		130.1	FLOOD	4
S2.003	S4	1.196	4.070	2.14		165.1	FLOOD	4
S2.004	S5	1.104	0.000	1.58		167.2	FLOOD RISK	
S3.000	S7	1.033	0.000	0.74		54.1	FLOOD RISK	
S3.001	S8	1.221	0.000	1.15		78.0	FLOOD RISK	
S3.002	S9	1.015	0.000	1.30		98.9	FLOOD RISK	
S3.003	S8	0.935	3.797	1.31		107.5	FLOOD	4
S2.005	S13	0.905	4.781	1.18		310.4	FLOOD	1
S2.006	S14	0.944	0.000	1.58		327.8	SURCHARGED	
S4.000	SSwale 1	-0.509	0.000	0.02		47.0	OK	
S4.001	S10	0.617	0.000	0.45		18.4	SURCHARGED	
S4.002	S9	1.167	4.641	1.31		90.5	FLOOD	3
S2.007	S10	0.912	0.000	2.26		433.3	SURCHARGED	
S5.000	S16	1.201	0.404	1.01		47.1	FLOOD	1
S5.001	S17	1.200	0.215	1.32		65.8	FLOOD	1
S5.002	S18	1.100	0.000	2.11		77.2	FLOOD RISK	
S5.003	S19	0.765	0.000	0.20		6.9	SURCHARGED	
S5.004	SSwale 2	-0.656	0.000	0.00		9.6	OK	
S5.005	S13	1.031	0.000	0.02		1.2	SURCHARGED	
S2.008	S14	0.744	0.000	2.72		447.4	SURCHARGED	
S2.009	S15	0.584	0.000	1.67		449.4	SURCHARGED	
S6.000	S24	0.886	0.000	1.52		117.3	FLOOD RISK	
S2.010	SBasin	0.457	0.000	0.17		46.6	SURCHARGED	
S2.011	S17	1.024	0.000	0.43		4.0	SURCHARGED	

.  
.  
.

Date 30/03/2021 08:32

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 16153  
NET 3 SWS.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S2.012	S30	1440 Winter	100	+40%	30/360 Winter				86.236	0.407
S1.003	SSwale 3	1440 Winter	100	+40%					86.231	-0.614
S1.004	S31	1440 Winter	100	+40%	1/30 Winter				86.231	0.703

PN	US/MH Name	Flooded		Pipe		Status	Level Exceeded
		Volume (m³)	Flow / Cap.	Flow (l/s)	Flow (l/s)		
S2.012	S30	0.000	0.07	4.0		SURCHARGED	
S1.003	SSwale 3	0.000	0.00	10.9		OK	
S1.004	S31	0.000	0.13	4.0		FLOOD RISK	



Date 12/04/2021 14:07

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes SWS NET 2 Manhole Sizes SWS NET 2

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.404	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
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 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)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	25.368	0.312	81.3	0.085	5.00	0.0	0.045	4	\=/	2000	1:4 Swale	
S1.001	25.368	0.327	77.6	0.085	0.00	0.0	0.045	4	\=/	2000	1:4 Swale	
S2.000	41.182	0.400	103.0	0.085	5.00	0.0	0.045		o	300	Pipe/Conduit	
S2.001	11.571	0.051	225.0	0.000	0.00	0.0	0.045		o	300	Pipe/Conduit	
S1.002	20.664	0.207	100.0	0.052	0.00	0.0	0.045	4	\=/	2000	1:4 Swale	
S1.003	20.664	0.207	100.0	0.052	0.00	0.0	0.045	4	\=/	2000	1:4 Swale	
S1.004	29.051	0.291	100.0	0.060	0.00	0.0	0.045	4	\=/	2000	1:4 Swale	
S1.005	29.051	0.291	99.8	0.060	0.00	0.0	0.045	4	\=/	2000	1:4 Swale	
S1.006	24.968	0.083	300.0	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)	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	5.70	91.250	0.085	0.0	0.0	0.0	0.60	234.5	11.4
S1.001	50.00	6.39	90.938	0.169	0.0	0.0	0.0	0.62	240.0	22.9
S2.000	50.00	6.76	90.750	0.085	0.0	0.0	0.0	0.39	27.5	11.5
S2.001	50.00	7.49	90.350	0.085	0.0	0.0	0.0	0.26	18.6	11.5
S1.002	50.00	8.13	90.299	0.306	0.0	0.0	0.0	0.54	211.4	41.5
S1.003	50.00	8.76	90.092	0.359	0.0	0.0	0.0	0.54	211.4	48.5
S1.004	50.00	9.66	89.885	0.419	0.0	0.0	0.0	0.54	211.4	56.7
S1.005	50.00	10.55	89.441	0.479	0.0	0.0	0.0	0.54	211.6	64.8
S1.006	50.00	11.01	89.150	0.479	0.0	0.0	0.0	0.90	63.8«	64.8

.  
.  
.



Date 12/04/2021 14:07

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

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)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	92.400	1.150	Junction		S1.000	91.250	2000				
S2	92.135	1.197	Junction		S1.001	90.938	2000	S1.000	90.938	2000	
S3	91.976	1.226	Open Manhole	1200	S2.000	90.750	300				
S4	91.571	1.221	Open Manhole	1200	S2.001	90.350	300	S2.000	90.350	300	
S2	91.500	1.201	Junction		S1.002	90.299	2000	S1.001	90.611	2000	312
								S2.001	90.299	300	
S4	91.415	1.323	Junction		S1.003	90.092	2000	S1.002	90.092	2000	
S3	91.142	1.256	Junction		S1.004	89.885	2000	S1.003	89.885	2000	
S6	90.824	1.383	Junction		S1.005	89.441	2000	S1.004	89.595	2000	154
S4	90.496	1.346	Open Manhole	2100	S1.006	89.150	300	S1.005	89.150	2000	
S	90.315	1.248	Open Manhole	0		OUTFALL		S1.006	89.067	300	





Date 12/04/2021 14:07

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	4 \=/	2000	S1	92.400	91.250	1.000	Junction	
S1.001	4 \=/	2000	S2	92.135	90.938	1.047	Junction	
S2.000	o	300	S3	91.976	90.750	0.926	Open Manhole	1200
S2.001	o	300	S4	91.571	90.350	0.921	Open Manhole	1200
S1.002	4 \=/	2000	S2	91.500	90.299	1.051	Junction	
S1.003	4 \=/	2000	S4	91.415	90.092	1.173	Junction	
S1.004	4 \=/	2000	S3	91.142	89.885	1.106	Junction	
S1.005	4 \=/	2000	S6	90.824	89.441	1.233	Junction	
S1.006	o	300	S4	90.496	89.150	1.046	Open Manhole	2100

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	25.368	81.3	S2	92.135	90.938	1.047	Junction	
S1.001	25.368	77.6	S2	91.500	90.611	0.739	Junction	
S2.000	41.182	103.0	S4	91.571	90.350	0.921	Open Manhole	1200
S2.001	11.571	225.0	S2	91.500	90.299	0.901	Junction	
S1.002	20.664	100.0	S4	91.415	90.092	1.173	Junction	
S1.003	20.664	100.0	S3	91.142	89.885	1.106	Junction	
S1.004	29.051	100.0	S6	90.824	89.595	1.080	Junction	
S1.005	29.051	99.8	S4	90.496	89.150	1.196	Open Manhole	2100
S1.006	24.968	300.0	S	90.315	89.067	0.948	Open Manhole	0

.  
.  
.

Date 12/04/2021 14:07

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	95	0.089	0.085	0.085
1.001	-	-	95	0.089	0.085	0.085
2.000	-	-	100	0.085	0.085	0.085
2.001	-	-	100	0.000	0.000	0.000
1.002	-	-	90	0.058	0.052	0.052
1.003	-	-	90	0.058	0.052	0.052
1.004	-	-	100	0.060	0.060	0.060
1.005	-	-	100	0.060	0.060	0.060
1.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.499	0.479	0.479

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.006	S	90.315	89.067	89.000	0	0



Date 12/04/2021 14:07

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

Online Controls for Storm

Orifice Manhole: S2, DS/PN: S1.001, Volume (m<sup>3</sup>): 192.5

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 90.938

Orifice Manhole: S2, DS/PN: S1.002, Volume (m<sup>3</sup>): 206.9

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 90.299

Orifice Manhole: S4, DS/PN: S1.003, Volume (m<sup>3</sup>): 168.9

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 90.092

Orifice Manhole: S3, DS/PN: S1.004, Volume (m<sup>3</sup>): 199.4

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 89.885

Orifice Manhole: S6, DS/PN: S1.005, Volume (m<sup>3</sup>): 256.3

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 89.441

Hydro-Brake® Optimum Manhole: S4, DS/PN: S1.006, Volume (m<sup>3</sup>): 296.3

Unit Reference	MD-SHE-0046-1000-1100-1000
Design Head (m)	1.100
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	46
Invert Level (m)	89.150
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	1.0	Kick-Flo®	0.408	0.6
Flush-Flo™	0.200	0.8	Mean Flow over Head Range	-	0.8

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.7	0.800	0.9	2.000	1.3	4.000	1.8	7.000	2.3
0.200	0.8	1.000	1.0	2.200	1.4	4.500	1.9	7.500	2.4
0.300	0.8	1.200	1.0	2.400	1.4	5.000	2.0	8.000	2.5
0.400	0.7	1.400	1.1	2.600	1.5	5.500	2.1	8.500	2.5
0.500	0.7	1.600	1.2	3.000	1.6	6.000	2.2	9.000	2.6
0.600	0.8	1.800	1.2	3.500	1.7	6.500	2.2	9.500	2.7



Date 12/04/2021 14:07

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/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 6 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750  
 Region England and Wales Ratio R 0.405 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status ON  
 DVD Status OFF  
 Inertia Status OFF

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) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
S1.000	S1	15 Winter	1	+0%					91.275	-1.125
S1.001	S2	60 Winter	1	+0%					91.248	-0.887
S2.000	S3	15 Winter	1	+0%	30/15 Summer	100/15 Summer			90.889	-0.161
S2.001	S4	15 Winter	1	+0%	1/15 Summer				90.691	0.041
S1.002	S2	15 Winter	1	+0%					90.679	-0.821
S1.003	S4	240 Winter	1	+0%					90.532	-0.883
S1.004	S3	360 Winter	1	+0%					90.211	-0.930
S1.005	S6	960 Winter	1	+0%					89.928	-0.896
S1.006	S4	960 Winter	1	+0%	1/60 Winter				89.785	0.335

PN	US/MH Name	Flooded		Pipe		Level Exceeded
		Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Flow (l/s)	Status	
S1.000	S1	0.000	0.00	11.8	OK	
S1.001	S2	0.000	0.00	2.8	OK	
S2.000	S3	0.000	0.42	11.4	OK	2
S2.001	S4	0.000	0.40	7.3	SURCHARGED	
S1.002	S2	0.000	0.00	11.4	OK	
S1.003	S4	0.000	0.00	2.9	OK	
S1.004	S3	0.000	0.00	2.9	OK	
S1.005	S6	0.000	0.00	2.4	OK	
S1.006	S4	0.000	0.01	0.8	SURCHARGED	



Date 12/04/2021 14:07

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/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 6 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750  
 Region England and Wales Ratio R 0.405 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status ON  
 DVD Status OFF  
 Inertia Status OFF

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) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth
									(m)	(m)
S1.000	S1	120 Winter	30	+0%					91.459	-0.941
S1.001	S2	120 Winter	30	+0%					91.459	-0.676
S2.000	S3	15 Winter	30	+0%	30/15 Summer	100/15 Summer			91.225	0.175
S2.001	S4	30 Winter	30	+0%	1/15 Summer				90.939	0.289
S1.002	S2	360 Winter	30	+0%					90.928	-0.571
S1.003	S4	480 Winter	30	+0%					90.815	-0.600
S1.004	S3	960 Winter	30	+0%					90.421	-0.720
S1.005	S6	1440 Winter	30	+0%					90.182	-0.642
S1.006	S4	1440 Winter	30	+0%	1/60 Winter				90.041	0.591

PN	US/MH Name	Flooded		Pipe		Level Exceeded
		Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Flow (l/s)	Status	
S1.000	S1	0.000	0.00	8.8	OK	
S1.001	S2	0.000	0.00	3.7	OK	
S2.000	S3	0.000	0.90	24.5	SURCHARGED	2
S2.001	S4	0.000	1.01	18.5	SURCHARGED	
S1.002	S2	0.000	0.00	7.2	OK	
S1.003	S4	0.000	0.00	3.4	OK	
S1.004	S3	0.000	0.00	3.0	OK	
S1.005	S6	0.000	0.00	2.5	OK	
S1.006	S4	0.000	0.02	0.9	SURCHARGED	



Date 12/04/2021 14:07

Designed by OliviaDent

File 16153 - ALL NETWORKS.MDX

Checked by

Innovyze

Network 2018.1

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/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 6 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750  
 Region England and Wales Ratio R 0.405 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status ON  
 DVD Status OFF  
 Inertia Status OFF

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) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth
									(m)	(m)
S1.000	S1	120 Winter	100	+40%					91.720	-0.680
S1.001	S2	120 Winter	100	+40%					91.720	-0.415
S2.000	S3	15 Winter	100	+40%	30/15 Summer	100/15 Summer			91.977	0.927
S2.001	S4	15 Winter	100	+40%	1/15 Summer				91.231	0.581
S1.002	S2	480 Winter	100	+40%					91.190	-0.310
S1.003	S4	480 Winter	100	+40%					91.072	-0.343
S1.004	S3	1440 Winter	100	+40%					90.673	-0.468
S1.005	S6	1440 Winter	100	+40%					90.429	-0.395
S1.006	S4	1440 Winter	100	+40%	1/60 Winter				90.285	0.835

PN	US/MH Name	Flooded		Pipe		Level Exceeded
		Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Flow (l/s)	Status	
S1.000	S1	0.000	0.00	16.3	OK	
S1.001	S2	0.000	0.00	4.0	OK	
S2.000	S3	0.872	1.42	38.9	FLOOD	2
S2.001	S4	0.000	2.09	38.3	SURCHARGED	
S1.002	S2	0.000	0.00	7.6	OK	
S1.003	S4	0.000	0.00	3.6	OK	
S1.004	S3	0.000	0.00	3.1	OK	
S1.005	S6	0.000	0.00	2.7	OK	
S1.006	S4	0.000	0.02	1.0	FLOOD RISK	