


Phoenix Design Partnership Ltd		Page 0
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway		Network 2020.1.3

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW NETWORK 1.SWS








Pipe Sizes SW NETWORK 1 Manhole Sizes SW NETWORK 1

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	100	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)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500


Designed with Level Soffits

Network Design Table for SW NETWORK 1.SWS

















PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	14.880	0.186	80.0	0.012	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	6.947	0.336	20.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	17.599	0.088	200.0	0.015	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	35.422	0.433	81.8	0.022	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	7.474	0.090	83.0	0.102	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.000	22.994	0.314	73.2	0.026	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	68.286	0.779	87.7	0.060	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	4.000	0.040	100.0	0.021	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)
1.000	69.27	5.17	63.280	0.012	0.0	0.0	0.0	1.46	58.2	2.3
1.001	69.04	5.21	63.094	0.012	0.0	0.0	0.0	2.89	114.9	2.3
2.000	68.42	5.32	62.846	0.015	0.0	0.0	0.0	0.92	36.6	2.8
1.002	66.59	5.66	62.683	0.049	0.0	0.0	0.0	1.74	123.0	8.8
1.003	66.14	5.74	62.250	0.151	0.0	0.0	0.0	1.44	57.1	27.0
3.000	68.81	5.25	62.474	0.026	0.0	0.0	0.0	1.53	60.8	4.8
1.004	62.84	6.42	62.085	0.237	0.0	0.0	0.0	1.68	118.8	40.3
4.000	69.96	5.05	62.390	0.021	0.0	0.0	0.0	1.31	52.0	4.0


Phoenix Design Partnership Ltd		Page 1
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway		Network 2020.1.3

Network Design Table for SW NETWORK 1.SWS
















PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
5.000	8.024	0.080	100.3	0.023	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.001	18.920	0.050	378.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	9.413	0.058	162.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.003	11.987	0.080	149.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
6.000	9.294	0.062	149.9	0.030	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.004	9.244	0.062	150.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.005	8.328	0.050	166.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
7.000	6.482	0.050	129.6	0.071	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.006	7.867	0.050	157.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.007	10.620	0.544	19.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	32.962	0.413	79.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	9.096	0.163	55.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	20.593	0.168	122.6	0.083	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	10.315	0.052	198.4	0.061	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.000	44.830	0.797	56.2	0.050	5.00	0.0	0.600	o	225	Pipe/Conduit	
8.001	10.190	0.174	58.6	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)
5.000	69.66	5.10	62.430	0.023	0.0	0.0	0.0	1.31	51.9	4.3
4.001	67.57	5.47	62.350	0.000	2.0	0.0	0.0	0.67	26.5	2.0
4.002	66.75	5.63	62.300	0.000	2.0	0.0	0.0	1.02	40.7	2.0
4.003	65.78	5.81	62.242	0.000	2.0	0.0	0.0	1.07	42.4	2.0
6.000	69.41	5.15	62.224	0.030	0.0	0.0	0.0	1.07	42.4	5.6
4.004	65.05	5.96	62.162	0.030	2.0	0.0	0.0	1.07	42.4	7.3
4.005	64.38	6.10	62.100	0.030	2.0	0.0	0.0	1.01	40.2	7.3
7.000	69.70	5.09	62.100	0.071	0.0	0.0	0.0	1.15	45.6	13.4
4.006	69.52	5.13	62.050	0.000	5.0	0.0	0.0	1.04	41.3	5.0
4.007	69.18	5.19	62.000	0.000	5.0	0.0	0.0	2.98	118.3	5.0
1.005	61.45	6.73	61.306	0.237	5.0	0.0	0.0	1.76	124.5	44.4
1.006	61.13	6.81	60.893	0.237	5.0	0.0	0.0	2.11	149.1	44.4
1.007	60.11	7.05	60.730	0.320	5.0	0.0	0.0	1.42	100.3	57.1
1.008	59.48	7.20	60.562	0.381	5.0	0.0	0.0	1.11	78.7	66.4
8.000	67.82	5.43	61.659	0.050	0.0	0.0	0.0	1.75	69.5	9.2
8.001	67.28	5.53	60.862	0.050	0.0	0.0	0.0	1.71	68.1	9.2


Phoenix Design Partnership Ltd		Page 2
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway		Network 2020.1.3

Network Design Table for SW NETWORK 1.SWS



PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
9.000	40.943	0.205	199.7	0.039	5.00	0.0	0.600	o	225	Pipe/Conduit	
8.002	10.584	0.103	102.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.009	4.440	0.022	200.0	0.074	0.00	0.0	0.600	o	375	Pipe/Conduit	
10.000	36.576	0.458	79.9	0.025	5.00	0.0	0.600	o	225	Pipe/Conduit	
10.001	35.248	0.407	86.6	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.010	19.535	0.098	199.3	0.045	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.011	17.064	0.085	200.8	0.013	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.012	5.900	0.030	196.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.013	11.619	0.050	232.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
11.000	7.409	0.623	11.9	0.009	5.00	0.0	0.600	o	225	Pipe/Conduit	
12.000	10.082	0.700	14.4	0.008	5.00	0.0	0.600	o	225	Pipe/Conduit	
11.001	9.099	0.088	103.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.002	16.656	0.162	102.8	0.049	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.003	25.940	0.371	69.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.004	28.641	0.150	190.9	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)
9.000	66.16	5.74	60.893	0.039	0.0	0.0	0.0	0.92	36.6	7.0
8.002	65.46	5.88	60.688	0.089	0.0	0.0	0.0	1.29	51.3	15.8
1.009	59.25	7.26	60.435	0.544	5.0	0.0	0.0	1.28	141.1	92.3
10.000	67.88	5.42	61.428	0.025	0.0	0.0	0.0	1.46	58.2	4.6
10.001	65.68	5.83	60.970	0.046	0.0	0.0	0.0	1.41	55.9	8.2
1.010	58.25	7.51	60.413	0.635	5.0	0.0	0.0	1.28	141.3	105.2
1.011	57.41	7.74	60.315	0.648	5.0	0.0	0.0	1.28	140.8	105.7
1.012	57.12	7.81	60.230	0.648	5.0	0.0	0.0	1.29	142.3	105.7
1.013	56.53	7.98	60.200	0.648	5.0	0.0	0.0	1.18	130.8	105.7
11.000	70.07	5.03	61.544	0.009	0.0	0.0	0.0	3.82	151.7	1.7
12.000	69.97	5.05	61.621	0.008	0.0	0.0	0.0	3.47	137.8	1.5
11.001	69.29	5.17	60.921	0.017	0.0	0.0	0.0	1.29	51.1	3.2
11.002	68.07	5.38	60.833	0.066	0.0	0.0	0.0	1.29	51.3	12.2
11.003	66.59	5.66	60.671	0.066	0.0	0.0	0.0	1.57	62.3	12.2
11.004	64.05	6.16	60.300	0.066	0.0	0.0	0.0	0.94	37.5	12.2


Phoenix Design Partnership Ltd		Page 3
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

Network Design Table for SW NETWORK 1.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.014	5.502	0.025	220.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.015	49.666	0.248	200.3	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)
1.014	69.75	5.09	60.150	0.000	2.0	0.0	0.0	1.06	74.6	2.0
1.015	65.68	5.83	60.125	0.000	2.0	0.0	0.0	1.11	78.3	2.0

Phoenix Design Partnership Ltd		Page 4
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway Network 2020.1.3		

Online Controls for SW NETWORK 1.SWS

Orifice Manhole: HW4, DS/PN: 4.007, Volume (m³): 1.8

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 62.000


Hydro-Brake® Optimum Manhole: FCC, DS/PN: 1.015, Volume (m³): 7.1

Unit Reference	MD-SHE-0167-1400-1200-1400
Design Head (m)	1.200
Design Flow (l/s)	14.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	167
Invert Level (m)	60.125
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	14.0
Flush-Flo™	0.363	13.9
Kick-Flo®	0.796	11.5
Mean Flow over Head Range	-	12.0

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.9	1.200	14.0	3.000	21.6	7.000	32.5
0.200	13.1	1.400	15.1	3.500	23.3	7.500	33.6
0.300	13.8	1.600	16.0	4.000	24.8	8.000	34.7
0.400	13.9	1.800	17.0	4.500	26.3	8.500	35.7
0.500	13.7	2.000	17.8	5.000	27.7	9.000	36.7
0.600	13.4	2.200	18.7	5.500	29.0	9.500	37.7
0.800	11.6	2.400	19.5	6.000	30.2		
1.000	12.8	2.600	20.2	6.500	31.4		

Phoenix Design Partnership Ltd		Page 5
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway		Network 2020.1.3

Storage Structures for SW NETWORK 1.SWS

Porous Car Park Manhole: 1, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	11.0
Membrane Percolation (mm/hr)	1000	Length (m)	11.0
Max Percolation (l/s)	33.6	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	64.100	Membrane Depth (mm)	0

Porous Car Park Manhole: 3, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	12.0
Membrane Percolation (mm/hr)	1000	Length (m)	12.0
Max Percolation (l/s)	40.0	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	63.700	Membrane Depth (mm)	0

Porous Car Park Manhole: 4, DS/PN: 1.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	14.0
Membrane Percolation (mm/hr)	1000	Length (m)	14.0
Max Percolation (l/s)	54.4	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	62.800	Membrane Depth (mm)	0

Porous Car Park Manhole: 5, DS/PN: 1.003


Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	18.0
Membrane Percolation (mm/hr)	1000	Length (m)	18.0
Max Percolation (l/s)	90.0	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	63.000	Membrane Depth (mm)	0

Porous Car Park Manhole: 7, DS/PN: 1.004

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	19.0
Membrane Percolation (mm/hr)	1000	Length (m)	19.0
Max Percolation (l/s)	100.3	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	63.000	Membrane Depth (mm)	0

Porous Car Park Manhole: 8, DS/PN: 4.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.0
Membrane Percolation (mm/hr)	1000	Length (m)	8.0
Max Percolation (l/s)	17.8	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	62.390	Membrane Depth (mm)	0

Phoenix Design Partnership Ltd		Page 6
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

Porous Car Park Manhole: 9, DS/PN: 5.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.0
Membrane Percolation (mm/hr)	1000	Length (m)	13.0
Max Percolation (l/s)	46.9	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	62.430	Membrane Depth (mm)	0

Tank or Pond Manhole: HW2, DS/PN: 4.002

Invert Level (m) 62.300

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	87.0	0.900	231.0

Porous Car Park Manhole: 30, DS/PN: 6.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	17.0
Membrane Percolation (mm/hr)	1000	Length (m)	17.0
Max Percolation (l/s)	80.3	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	62.224	Membrane Depth (mm)	0

Porous Car Park Manhole: 31, DS/PN: 7.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.0
Membrane Percolation (mm/hr)	1000	Length (m)	8.0
Max Percolation (l/s)	17.8	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	62.400	Membrane Depth (mm)	0

Tank or Pond Manhole: HW4, DS/PN: 4.007

Invert Level (m) 62.000


Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	12.5	0.900	162.0

Porous Car Park Manhole: 20, DS/PN: 1.007

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	15.0
Max Percolation (l/s)	62.5	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	61.630	Membrane Depth (mm)	0

Porous Car Park Manhole: 21, DS/PN: 1.008

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0
Membrane Percolation (mm/hr)	1000	Porosity	0.30
Max Percolation (l/s)	43.4	Invert Level (m)	61.300

Phoenix Design Partnership Ltd		Page 7
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway Network 2020.1.3		

Porous Car Park Manhole: 21, DS/PN: 1.008

Width (m) 12.5 Depression Storage (mm) 5
Length (m) 12.5 Evaporation (mm/day) 3
Slope (1:X) 1000.0 Membrane Depth (mm) 0

Porous Car Park Manhole: 32, DS/PN: 8.000

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 18.8
Membrane Percolation (mm/hr) 1000 Length (m) 18.8
Max Percolation (l/s) 98.2 Slope (1:X) 1000.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 62.140 Membrane Depth (mm) 0

Porous Car Park Manhole: 35, DS/PN: 9.000

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 20.0
Membrane Percolation (mm/hr) 1000 Length (m) 20.0
Max Percolation (l/s) 111.1 Slope (1:X) 1000.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 61.142 Membrane Depth (mm) 0

Porous Car Park Manhole: 22, DS/PN: 1.009

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 14.0
Membrane Percolation (mm/hr) 1000 Length (m) 14.0
Max Percolation (l/s) 54.4 Slope (1:X) 1000.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 61.150 Membrane Depth (mm) 0

Porous Car Park Manhole: 36, DS/PN: 10.000


Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 16.0
Membrane Percolation (mm/hr) 1000 Length (m) 16.0
Max Percolation (l/s) 71.1 Slope (1:X) 1000.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 61.950 Membrane Depth (mm) 0

Porous Car Park Manhole: 37, DS/PN: 10.001

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 14.5
Membrane Percolation (mm/hr) 1000 Length (m) 14.5
Max Percolation (l/s) 58.4 Slope (1:X) 1000.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 61.500 Membrane Depth (mm) 0

Porous Car Park Manhole: 23, DS/PN: 1.010

Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.30
Membrane Percolation (mm/hr) 1000 Invert Level (m) 60.850
Max Percolation (l/s) 33.6 Width (m) 11.0
Safety Factor 2.0 Length (m) 11.0

Phoenix Design Partnership Ltd		Page 8
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway		

Network 2020.1.3

Porous Car Park Manhole: 23, DS/PN: 1.010

Slope (1:X) 1000.0 Evaporation (mm/day) 3
Depression Storage (mm) 5 Membrane Depth (mm) 0

Porous Car Park Manhole: 38, DS/PN: 11.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	27.8	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	62.100	Membrane Depth (mm)	0


Porous Car Park Manhole: 43, DS/PN: 12.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	9.0
Membrane Percolation (mm/hr)	1000	Length (m)	9.0
Max Percolation (l/s)	22.5	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	62.100	Membrane Depth (mm)	0

Tank or Pond Manhole: HW6, DS/PN: 1.014

Invert Level (m) 60.150

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	149.0	1.500	517.0

Phoenix Design Partnership Ltd		Page 0
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW NETWORK 1.SWS

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 22
Number of Online Controls 2 Number of Time/Area Diagrams 1
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
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, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	30 Winter	1	+0%					63.303
1.001	2	30 Winter	1	+0%					63.109
2.000	3	30 Winter	1	+0%					62.877
1.002	4	30 Winter	1	+0%					62.722
1.003	5	30 Winter	1	+0%	30/15 Summer				62.339
3.000	6	15 Winter	1	+0%					62.511
1.004	7	15 Winter	1	+0%	100/15 Winter				62.174
4.000	8	60 Winter	1	+0%	30/30 Winter				62.480
5.000	9	60 Winter	1	+0%	100/30 Winter				62.469
4.001	HW1	60 Winter	1	+0%	30/15 Winter				62.480
4.002	HW2	60 Winter	1	+0%	30/30 Winter				62.398
4.003	13	60 Winter	1	+0%	30/30 Summer				62.338
6.000	30	120 Winter	1	+0%	30/60 Winter				62.273
4.004	14	60 Winter	1	+0%	30/15 Summer				62.309
4.005	15	60 Winter	1	+0%	30/15 Summer				62.296
7.000	31	60 Winter	1	+0%	30/15 Summer				62.285
4.006	HW3	60 Winter	1	+0%	1/60 Winter				62.285
4.007	HW4	60 Winter	1	+0%	1/30 Winter				62.274
1.005	18	30 Winter	1	+0%	30/15 Winter				61.402
1.006	19	30 Winter	1	+0%	30/15 Summer				60.996
1.007	20	15 Winter	1	+0%	30/15 Summer				60.858

Phoenix Design Partnership Ltd		Page 1
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway		Network 2020.1.3

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW NETWORK 1.SWS


PN	US/MH Name	Surcharged Flooded		Flow / Overflow Cap.	Flow (l/s)	Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m ³)			Time (mins)	Flow (l/s)		
1.000	1	-0.202	0.000	0.02		5	1.1	OK	
1.001	2	-0.210	0.000	0.01			1.1	OK	
2.000	3	-0.194	0.000	0.04		7	1.4	OK	
1.002	4	-0.261	0.000	0.04		7	4.4	OK	
1.003	5	-0.136	0.000	0.32		9	13.4	OK	
3.000	6	-0.188	0.000	0.06			3.6	OK	
1.004	7	-0.211	0.000	0.18		8	21.0	OK	
4.000	8	-0.135	0.000	0.05		20	1.4	OK	
5.000	9	-0.186	0.000	0.03		16	1.4	OK	
4.001	HW1	-0.095	0.000	0.63			15.0	OK	
4.002	HW2	-0.127	0.000	0.39			13.3	OK	
4.003	13	-0.129	0.000	0.37			13.3	OK	
6.000	30	-0.176	0.000	0.05		22	1.8	OK	
4.004	14	-0.078	0.000	0.35			12.4	OK	
4.005	15	-0.029	0.000	0.38			12.1	OK	
7.000	31	-0.040	0.000	0.17		29	5.2	OK	
4.006	HW3	0.010	0.000	0.40			12.7	SURCHARGED	
4.007	HW4	0.049	0.000	0.10			9.9	SURCHARGED	
1.005	18	-0.204	0.000	0.23			25.7	OK	
1.006	19	-0.197	0.000	0.25			25.8	OK	
1.007	20	-0.172	0.000	0.37		8	32.5	OK	

Phoenix Design Partnership Ltd		Page 2
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway		Network 2020.1.3

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW NETWORK 1.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.008	21	15	Winter	1	+0%	30/15	Summer		60.734
8.000	32	15	Winter	1	+0%				61.706
8.001	33	15	Winter	1	+0%	30/15	Winter		60.916
9.000	35	30	Winter	1	+0%	30/15	Winter		60.941
8.002	34	30	Winter	1	+0%	30/15	Summer		60.751
1.009	22	15	Winter	1	+0%	30/15	Summer		60.648
10.000	36	30	Winter	1	+0%				61.458
10.001	37	30	Winter	1	+0%	100/60	Winter		61.012
1.010	23	30	Winter	1	+0%	30/15	Summer		60.599
1.011	24	30	Winter	1	+0%	30/15	Summer		60.507
1.012	25	240	Winter	1	+0%	30/15	Summer		60.464
1.013	HW5	240	Winter	1	+0%	30/15	Summer		60.460
11.000	38	30	Winter	1	+0%				61.552
12.000	43	30	Winter	1	+0%				61.629
11.001	39	30	Winter	1	+0%	100/240	Winter		60.950
11.002	40	30	Winter	1	+0%	100/120	Winter		60.887
11.003	41	15	Winter	1	+0%	30/120	Winter		60.719
11.004	HW7	240	Winter	1	+0%	30/15	Winter		60.452
1.014	HW6	240	Winter	1	+0%	1/240	Winter		60.451
1.015	FCC	240	Winter	1	+0%	1/240	Winter		60.445

PN	US/MH Name	Surcharged Flooded			Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap. (l/s)	Time (mins)	Flow (l/s)		
1.008	21	-0.128	0.000	0.62		7	38.1	OK
8.000	32	-0.178	0.000	0.09		5	6.0	OK
8.001	33	-0.171	0.000	0.11			6.2	OK
9.000	35	-0.177	0.000	0.09		7	3.0	OK
8.002	34	-0.162	0.000	0.18			7.6	OK
1.009	22	-0.162	0.000	0.61		6	50.2	OK
10.000	36	-0.195	0.000	0.04		7	2.2	OK
10.001	37	-0.183	0.000	0.07		9	3.8	OK
1.010	23	-0.189	0.000	0.49		10	57.9	OK
1.011	24	-0.183	0.000	0.52			59.0	OK
1.012	25	-0.140	0.000	0.28			25.4	OK
1.013	HW5	-0.115	0.000	0.25			25.1	OK
11.000	38	-0.217	0.000	0.01		3	0.8	OK
12.000	43	-0.217	0.000	0.01		3	0.8	OK
11.001	39	-0.196	0.000	0.04			1.5	OK
11.002	40	-0.171	0.000	0.13			5.8	OK
11.003	41	-0.177	0.000	0.10			5.8	OK
11.004	HW7	-0.073	0.000	0.05			1.8	OK
1.014	HW6	0.001	0.000	0.29			15.0	SURCHARGED
1.015	FCC	0.020	0.000	0.19			13.9	SURCHARGED

Phoenix Design Partnership Ltd		Page 3
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway		Network 2020.1.3

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW NETWORK 1.SWS

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 22
Number of Online Controls 2 Number of Time/Area Diagrams 1
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
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, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Summer	30	+0%					63.323
1.001	2	15 Winter	30	+0%					63.128
2.000	3	15 Winter	30	+0%					62.905
1.002	4	15 Winter	30	+0%					62.761
1.003	5	15 Winter	30	+0%	30/15 Summer				62.510
3.000	6	15 Winter	30	+0%					62.534
1.004	7	15 Winter	30	+0%	100/15 Winter				62.272
4.000	8	30 Winter	30	+0%	30/30 Winter				62.619
5.000	9	60 Winter	30	+0%	100/30 Winter				62.598
4.001	HW1	30 Winter	30	+0%	30/15 Winter				62.619
4.002	HW2	60 Winter	30	+0%	30/30 Winter				62.552
4.003	13	60 Winter	30	+0%	30/30 Summer				62.507
6.000	30	120 Winter	30	+0%	30/60 Winter				62.470
4.004	14	120 Winter	30	+0%	30/15 Summer				62.470
4.005	15	120 Winter	30	+0%	30/15 Summer				62.455
7.000	31	120 Winter	30	+0%	30/15 Summer				62.442
4.006	HW3	120 Winter	30	+0%	1/60 Winter				62.441
4.007	HW4	120 Winter	30	+0%	1/30 Winter				62.427
1.005	18	15 Winter	30	+0%	30/15 Winter				61.682
1.006	19	15 Winter	30	+0%	30/15 Summer				61.515
1.007	20	15 Winter	30	+0%	30/15 Summer				61.382

Phoenix Design Partnership Ltd		Page 4
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW NETWORK 1.SWS


PN	US/MH Name	Surcharged		Flooded	Flow / Overflow Cap. (l/s)	Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow (l/s)		Time (mins)	Flow (l/s)		
1.000	1	-0.182	0.000	0.08		6	3.9	OK	
1.001	2	-0.191	0.000	0.05			4.1	OK	
2.000	3	-0.166	0.000	0.15		6	5.0	OK	
1.002	4	-0.222	0.000	0.15		6	16.5	OK	
1.003	5	0.035	0.000	1.20		4	50.7	SURCHARGED	
3.000	6	-0.165	0.000	0.16			8.8	OK	
1.004	7	-0.113	0.000	0.68		5	76.8	OK	
4.000	8	0.004	0.000	0.09		25	2.6	SURCHARGED	
5.000	9	-0.057	0.000	0.10		25	4.0	OK	
4.001	HW1	0.044	0.000	1.45			34.6	SURCHARGED	
4.002	HW2	0.027	0.000	0.60			20.1	SURCHARGED	
4.003	13	0.040	0.000	0.55			19.9	SURCHARGED	
6.000	30	0.021	0.000	0.14		67	4.8	SURCHARGED	
4.004	14	0.083	0.000	0.38			13.1	SURCHARGED	
4.005	15	0.129	0.000	0.42			13.1	SURCHARGED	
7.000	31	0.117	0.000	0.23		27	7.4	SURCHARGED	
4.006	HW3	0.166	0.000	0.58			18.2	SURCHARGED	
4.007	HW4	0.202	0.000	0.13			12.8	SURCHARGED	
1.005	18	0.076	0.000	0.64			73.5	SURCHARGED	
1.006	19	0.322	0.000	0.72			73.0	SURCHARGED	
1.007	20	0.352	0.000	0.98		9	86.0	SURCHARGED	

Phoenix Design Partnership Ltd		Page 5
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW NETWORK 1.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.008	21	240	Winter	30	+0%	30/15	Summer		61.228
8.000	32	15	Winter	30	+0%				61.737
8.001	33	240	Winter	30	+0%	30/15	Winter		61.164
9.000	35	240	Winter	30	+0%	30/15	Winter		61.163
8.002	34	240	Winter	30	+0%	30/15	Summer		61.162
1.009	22	240	Winter	30	+0%	30/15	Summer		61.161
10.000	36	15	Winter	30	+0%				61.487
10.001	37	240	Winter	30	+0%	100/60	Winter		61.159
1.010	23	240	Winter	30	+0%	30/15	Summer		61.156
1.011	24	240	Winter	30	+0%	30/15	Summer		61.069
1.012	25	360	Winter	30	+0%	30/15	Summer		60.985
1.013	HW5	360	Winter	30	+0%	30/15	Summer		60.982
11.000	38	15	Winter	30	+0%				61.569
12.000	43	15	Summer	30	+0%				61.645
11.001	39	15	Winter	30	+0%	100/240	Winter		60.979
11.002	40	360	Winter	30	+0%	100/120	Winter		60.979
11.003	41	360	Winter	30	+0%	30/120	Winter		60.978
11.004	HW7	360	Winter	30	+0%	30/15	Winter		60.977
1.014	HW6	360	Winter	30	+0%	1/240	Winter		60.977
1.015	FCC	360	Winter	30	+0%	1/240	Winter		60.972

PN	US/MH Name	Surcharged Flooded			Half Drain Pipe		Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap. (l/s)	Time (mins)				
1.008	21	0.366	0.000	0.55	221	33.9	SURCHARGED		
8.000	32	-0.147	0.000	0.25	6	16.7	OK		
8.001	33	0.077	0.000	0.06		3.2	SURCHARGED		
9.000	35	0.045	0.000	0.09	12	3.3	SURCHARGED		
8.002	34	0.249	0.000	0.13		5.4	SURCHARGED		
1.009	22	0.351	0.000	0.52	239	42.7	SURCHARGED		
10.000	36	-0.166	0.000	0.15	6	8.3	OK		
10.001	37	-0.036	0.000	0.06	34	3.0	OK		
1.010	23	0.368	0.000	0.39	103	46.6	SURCHARGED		
1.011	24	0.379	0.000	0.39		45.1	SURCHARGED		
1.012	25	0.380	0.000	0.38		35.1	SURCHARGED		
1.013	HW5	0.407	0.000	0.35		34.6	SURCHARGED		
11.000	38	-0.200	0.000	0.03	5	3.1	OK		
12.000	43	-0.201	0.000	0.02	5	2.6	OK		
11.001	39	-0.167	0.000	0.14		5.7	OK		
11.002	40	-0.079	0.000	0.07		3.1	OK		
11.003	41	0.082	0.000	0.05		3.1	SURCHARGED		
11.004	HW7	0.452	0.000	0.08		2.6	SURCHARGED		
1.014	HW6	0.527	0.000	0.30		15.1	SURCHARGED		
1.015	FCC	0.547	0.000	0.19		13.9	SURCHARGED		

Phoenix Design Partnership Ltd		Page 6
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 22
Number of Online Controls 2 Number of Time/Area Diagrams 1
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
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, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	100	+0%					63.329
1.001	2	15 Winter	100	+0%					63.132
2.000	3	15 Winter	100	+0%					62.915
1.002	4	15 Winter	100	+0%					62.774
1.003	5	15 Winter	100	+0%	30/15 Summer				62.607
3.000	6	15 Winter	100	+0%					62.543
1.004	7	15 Winter	100	+0%	100/15 Winter				62.435
4.000	8	60 Winter	100	+0%	30/30 Winter				62.705
5.000	9	60 Winter	100	+0%	100/30 Winter				62.704
4.001	HW1	60 Winter	100	+0%	30/15 Winter				62.705
4.002	HW2	60 Winter	100	+0%	30/30 Winter				62.628
4.003	13	120 Winter	100	+0%	30/30 Summer				62.579
6.000	30	120 Winter	100	+0%	30/60 Winter				62.554
4.004	14	120 Winter	100	+0%	30/15 Summer				62.554
4.005	15	120 Winter	100	+0%	30/15 Summer				62.537
7.000	31	120 Winter	100	+0%	30/15 Summer				62.523
4.006	HW3	120 Winter	100	+0%	1/60 Winter				62.522
4.007	HW4	120 Winter	100	+0%	1/30 Winter				62.506
1.005	18	15 Winter	100	+0%	30/15 Winter				62.023
1.006	19	15 Winter	100	+0%	30/15 Summer				61.763
1.007	20	15 Winter	100	+0%	30/15 Summer				61.626

Phoenix Design Partnership Ltd		Page 7
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

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


PN	US/MH Name	Surcharged		Flooded		Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow (l/s)	Overflow (l/s)					
1.000	1	-0.176	0.000	0.10			6	5.3	OK	
1.001	2	-0.187	0.000	0.06				5.2	OK	
2.000	3	-0.156	0.000	0.20			6	6.5	OK	
1.002	4	-0.209	0.000	0.19			6	21.8	OK	
1.003	5	0.132	0.000	1.54			5	65.2	SURCHARGED	
3.000	6	-0.156	0.000	0.21				11.4	OK	
1.004	7	0.050	0.000	0.84			3	95.0	SURCHARGED	
4.000	8	0.090	0.000	0.09			42	2.8	SURCHARGED	
5.000	9	0.049	0.000	0.12			34	4.9	SURCHARGED	
4.001	HW1	0.130	0.000	1.70				40.6	SURCHARGED	
4.002	HW2	0.103	0.000	0.73				24.7	SURCHARGED	
4.003	13	0.112	0.000	0.58				21.2	SURCHARGED	
6.000	30	0.105	0.000	0.14			90	4.8	FLOOD RISK	
4.004	14	0.167	0.000	0.43				15.0	SURCHARGED	
4.005	15	0.212	0.000	0.48				15.0	FLOOD RISK	
7.000	31	0.198	0.000	0.31			48	9.8	SURCHARGED	
4.006	HW3	0.247	0.000	0.58				18.3	SURCHARGED	
4.007	HW4	0.281	0.000	0.14				14.1	SURCHARGED	
1.005	18	0.417	0.000	0.80				91.7	SURCHARGED	
1.006	19	0.570	0.000	0.90				91.4	SURCHARGED	
1.007	20	0.596	0.000	1.24			11	108.5	SURCHARGED	

Phoenix Design Partnership Ltd		Page 8
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.008	21	15	Winter	100	+0%	30/15	Summer		61.372
8.000	32	15	Winter	100	+0%				61.749
8.001	33	240	Winter	100	+0%	30/15	Winter		61.293
9.000	35	240	Winter	100	+0%	30/15	Winter		61.290
8.002	34	240	Winter	100	+0%	30/15	Summer		61.292
1.009	22	240	Winter	100	+0%	30/15	Summer		61.294
10.000	36	15	Winter	100	+0%				61.497
10.001	37	240	Winter	100	+0%	100/60	Winter		61.291
1.010	23	240	Winter	100	+0%	30/15	Summer		61.289
1.011	24	360	Winter	100	+0%	30/15	Summer		61.217
1.012	25	360	Winter	100	+0%	30/15	Summer		61.186
1.013	HW5	360	Winter	100	+0%	30/15	Summer		61.182
11.000	38	15	Winter	100	+0%				61.572
12.000	43	15	Winter	100	+0%				61.647
11.001	39	360	Winter	100	+0%	100/240	Winter		61.176
11.002	40	360	Winter	100	+0%	100/120	Winter		61.176
11.003	41	360	Winter	100	+0%	30/120	Winter		61.176
11.004	HW7	360	Winter	100	+0%	30/15	Winter		61.176
1.014	HW6	360	Winter	100	+0%	1/240	Winter		61.176
1.015	FCC	360	Winter	100	+0%	1/240	Winter		61.170

PN	US/MH Name	Surcharged Flooded			Half Drain Pipe		Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)	
1.008	21	0.510	0.000	1.79	4	109.6	SURCHARGED
8.000	32	-0.135	0.000	0.33	6	21.7	OK
8.001	33	0.206	0.000	0.07		3.8	SURCHARGED
9.000	35	0.172	0.000	0.16	69	5.6	SURCHARGED
8.002	34	0.379	0.000	0.14		6.1	SURCHARGED
1.009	22	0.484	0.000	0.65	78	53.8	SURCHARGED
10.000	36	-0.156	0.000	0.20	6	10.8	OK
10.001	37	0.096	0.000	0.07	133	3.8	SURCHARGED
1.010	23	0.501	0.000	0.46	234	54.1	FLOOD RISK
1.011	24	0.527	0.000	0.38		42.8	FLOOD RISK
1.012	25	0.581	0.000	0.47		42.7	FLOOD RISK
1.013	HW5	0.607	0.000	0.42		42.1	FLOOD RISK
11.000	38	-0.197	0.000	0.04	5	4.0	OK
12.000	43	-0.199	0.000	0.03	5	3.5	OK
11.001	39	0.030	0.000	0.03		1.0	SURCHARGED
11.002	40	0.118	0.000	0.09		4.1	SURCHARGED
11.003	41	0.280	0.000	0.07		4.0	SURCHARGED
11.004	HW7	0.651	0.000	0.09		3.1	SURCHARGED
1.014	HW6	0.726	0.000	0.31		15.5	SURCHARGED
1.015	FCC	0.745	0.000	0.19		13.9	SURCHARGED

Phoenix Design Partnership Ltd		Page 0
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

Summary of Critical Results by Maximum Level (Rank 1) for SW NETWORK 1.SWS

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 22
Number of Online Controls 2 Number of Time/Area Diagrams 1
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 100
Climate Change (%) 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	100	+40%					63.337
1.001	2	15 Winter	100	+40%					63.140
2.000	3	15 Winter	100	+40%					62.928
1.002	4	15 Winter	100	+40%					62.885
1.003	5	15 Winter	100	+40%	100/15	Summer			62.915
3.000	6	15 Winter	100	+40%	100/15	Summer			62.804
1.004	7	15 Winter	100	+40%	100/15	Summer			62.772
4.000	8	60 Winter	100	+40%	100/15	Summer			62.898
5.000	9	60 Winter	100	+40%	100/15	Summer			62.897
4.001	HW1	60 Winter	100	+40%	100/15	Summer			62.898
4.002	HW2	120 Winter	100	+40%	100/15	Summer			62.770
4.003	13	120 Winter	100	+40%	100/15	Summer			62.719
6.000	30	120 Winter	100	+40%	100/15	Summer			62.682
4.004	14	120 Winter	100	+40%	100/15	Summer			62.682
4.005	15	120 Winter	100	+40%	100/15	Summer			62.660
7.000	31	120 Winter	100	+40%	100/15	Summer			62.643
4.006	HW3	120 Winter	100	+40%	100/15	Summer			62.641
4.007	HW4	120 Winter	100	+40%	100/15	Summer			62.618
1.005	18	15 Winter	100	+40%	100/15	Summer			62.196
1.006	19	30 Winter	100	+40%	100/15	Summer			61.880
1.007	20	30 Winter	100	+40%	100/15	Summer			61.741
1.008	21	360 Winter	100	+40%	100/15	Summer			61.604

Phoenix Design Partnership Ltd		Page 1
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

Summary of Critical Results by Maximum Level (Rank 1) for SW NETWORK 1.SWS

PN	US/MH Name	Surcharged		Flooded	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.						
1.000	1	-0.168	0.000	0.15			6	7.4	OK	
1.001	2	-0.179	0.000	0.09				7.4	OK	
2.000	3	-0.143	0.000	0.28			6	9.1	OK	
1.002	4	-0.098	0.000	0.39			4	43.8	OK	
1.003	5	0.440	0.000	1.71			8	72.1	SURCHARGED	
3.000	6	0.105	0.000	0.27				15.2	SURCHARGED	
1.004	7	0.387	0.000	0.91			6	103.6	SURCHARGED	
4.000	8	0.283	0.000	0.15			55	4.5	SURCHARGED	
5.000	9	0.242	0.000	0.20			48	7.9	FLOOD RISK	
4.001	HW1	0.323	0.000	2.13				50.8	SURCHARGED	
4.002	HW2	0.245	0.000	0.71				23.7	SURCHARGED	
4.003	13	0.252	0.000	0.65				23.6	SURCHARGED	
6.000	30	0.233	0.000	0.11				3.7	FLOOD RISK	
4.004	14	0.295	0.000	0.48				16.9	FLOOD RISK	
4.005	15	0.335	0.000	0.54				16.9	FLOOD RISK	
7.000	31	0.318	0.000	0.41			86	12.9	SURCHARGED	
4.006	HW3	0.366	0.000	0.65				20.4	FLOOD RISK	
4.007	HW4	0.393	0.000	0.16				15.7	FLOOD RISK	
1.005	18	0.590	0.000	0.91				103.2	SURCHARGED	
1.006	19	0.687	0.000	0.97				98.2	SURCHARGED	
1.007	20	0.711	0.000	1.25			6	109.9	SURCHARGED	
1.008	21	0.742	0.000	0.70			156	43.0	FLOOD RISK	

Phoenix Design Partnership Ltd		Page 2
Unit 9 Westway Business Centre Marksbury Bath, BA2 9HN	Kidlington SW Network 1	
Date 01/01/0001 File SW Network 1.MDX	Designed by Mark Checked by	
Causeway	Network 2020.1.3	

Summary of Critical Results by Maximum Level (Rank 1) for SW NETWORK 1.SWS

PN	US/MH		Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
	Name									
8.000	32	15	Winter	100	+40%					61.768
8.001	33	360	Winter	100	+40%	100/15	Summer			61.535
9.000	35	360	Winter	100	+40%	100/15	Summer			61.534
8.002	34	360	Winter	100	+40%	100/15	Summer			61.534
1.009	22	360	Winter	100	+40%	100/15	Summer			61.534
10.000	36	360	Winter	100	+40%					61.531
10.001	37	360	Winter	100	+40%	100/15	Winter			61.530
1.010	23	360	Winter	100	+40%	100/15	Summer			61.528
1.011	24	480	Winter	100	+40%	100/15	Summer			61.473
1.012	25	480	Winter	100	+40%	100/15	Summer			61.429
1.013	HW5	480	Winter	100	+40%	100/15	Summer			61.424
11.000	38	15	Winter	100	+40%					61.576
12.000	43	15	Winter	100	+40%					61.651
11.001	39	480	Winter	100	+40%	100/120	Summer			61.418
11.002	40	480	Winter	100	+40%	100/60	Summer			61.418
11.003	41	480	Winter	100	+40%	100/30	Summer			61.418
11.004	HW7	480	Winter	100	+40%	100/15	Summer			61.418
1.014	HW6	480	Winter	100	+40%	100/15	Summer			61.418
1.015	FCC	480	Winter	100	+40%	100/15	Summer			61.412

PN	US/MH Name	Surcharged		Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe		Level Exceeded
		Depth (m)	Volume (m³)	Flow (l/s)	Time (mins)				Flow (l/s)	Status	
8.000	32	-0.116	0.000	0.46				6	30.4		OK
8.001	33	0.448	0.000	0.07					4.0	SURCHARGED	
9.000	35	0.416	0.000	0.13				252	4.5	FLOOD RISK	
8.002	34	0.621	0.000	0.14					6.1	FLOOD RISK	
1.009	22	0.724	0.000	0.64				266	52.7	FLOOD RISK	
10.000	36	-0.122	0.000	0.04				86	2.2		OK
10.001	37	0.335	0.000	0.07				99	3.4	SURCHARGED	
1.010	23	0.740	0.000	0.45				403	53.2	FLOOD RISK	
1.011	24	0.783	0.000	0.40					45.4	FLOOD RISK	
1.012	25	0.824	0.000	0.50					45.3	FLOOD RISK	
1.013	HW5	0.850	0.000	0.45					44.7	FLOOD RISK	
11.000	38	-0.193	0.000	0.05				6	5.6		OK
12.000	43	-0.195	0.000	0.04				6	5.0		OK
11.001	39	0.272	0.000	0.03					1.2	SURCHARGED	
11.002	40	0.360	0.000	0.10					4.4	SURCHARGED	
11.003	41	0.522	0.000	0.07					4.1	SURCHARGED	
11.004	HW7	0.893	0.000	0.10					3.6	FLOOD RISK	
1.014	HW6	0.968	0.000	0.31					15.5	FLOOD RISK	
1.015	FCC	0.987	0.000	0.20					14.5	FLOOD RISK	