

# **Appendix E**

## **SW design and Simulation Results**

### Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.277	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

### Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.032	5.00	49.000	1200		299512.895	174089.018	1.300
2	0.024	5.00	48.150	1200		299521.402	174083.026	1.250
3	0.160	5.00	47.600	1200		299523.731	174078.206	1.200
4	0.016	5.00	42.600	1200		299563.088	174049.695	1.400
5	0.093	5.00	41.650	1200		299572.645	174043.058	1.200
6			37.500	1200		299604.284	174020.269	1.275
7	0.041	5.00	36.500	1200		299614.450	174013.100	1.200
8			33.900	1200		299636.506	173996.805	1.200
9	0.060	5.00	33.750	1200		299639.781	173997.505	1.200
10			31.300	1200		299662.702	173979.304	1.200
11			29.475	1200		299679.447	173965.023	1.200
12	0.121	5.00	29.100	1200		299681.145	173960.829	1.275
13			28.450	1200		299704.272	173945.236	1.900
14	0.070	5.00	28.200	1200		299709.040	173940.288	1.750
15			27.000	1200		299703.793	173923.180	1.500
16	0.041	5.00	25.075	1200		299699.206	173896.696	1.725
17	0.022	5.00	24.250	1200		299714.966	173894.162	2.750
18			24.250	1500		299714.405	173885.455	3.100
18A			22.500	2100		299714.539	173882.933	1.500
19	0.022	5.00	41.350	1200		299566.605	174034.490	1.425
20	0.026	5.00	40.780	1200		299559.368	174026.040	1.500
21	0.079	5.00	39.350	1200		299539.571	174010.889	1.500
22	0.030	5.00	38.700	1200		299519.562	174001.161	1.500
23			34.500	1200		299537.423	173968.313	0.600
24	0.014	5.00	29.000	1200		299577.105	173943.656	0.600
25			25.500	1200		299614.421	173917.191	1.000
26			25.200	1200		299635.147	173913.512	1.050
27	0.022	5.00	25.500	1200		299690.536	173904.562	1.700
28	0.024	5.00	36.350	1200		299609.646	174006.778	1.300
29	0.087	5.00	35.075	1200		299599.478	173991.129	1.550
30	0.041	5.00	31.350	1200		299574.685	173955.191	1.550
31	0.028	5.00	30.250	1200		299659.837	173963.664	1.400
32			28.900	1200		299649.442	173949.181	1.500
33	0.083	5.00	28.600	1200		299645.919	173947.648	1.400
34	0.045	5.00	26.650	1200		299631.444	173927.634	1.550
35	0.027	5.00	31.075	1200		299754.078	173946.977	1.425
36	0.043	5.00	30.160	1200		299731.557	173942.521	1.510

### Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
37	0.030	5.00	28.550	1200		299711.662	173942.984	1.550
38	0.075	5.00	30.000	1200		299705.210	173979.876	1.350
39			29.500	1200		299700.029	173973.271	0.992
40	0.028	5.00	29.480	1200		299696.685	173973.280	1.029
41	0.067	5.00	25.900	1200		299770.684	173909.351	1.300
42			23.900	1200		299782.089	173887.291	1.500
OC22	0.021	5.00	38.600	675	675	299623.358	174036.058	1.300
OC23	0.028	5.00	37.330	675	675	299614.603	174023.047	1.000

### Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	10.405	0.600	47.700	46.900	0.800	13.0	225	5.05	43.1
1.001	2	3	5.353	0.600	46.900	46.400	0.500	10.7	225	5.07	43.0
1.002	3	4	48.599	0.600	46.400	41.200	5.200	9.3	225	5.26	42.4
1.003	4	5	11.636	0.600	41.200	40.450	0.750	15.5	225	5.32	42.2
1.004	5	6	38.992	0.600	40.450	36.300	4.150	9.4	300	5.47	41.8
1.005	6	7	12.440	0.600	36.225	35.300	0.925	13.4	300	5.52	41.6
1.006	7	8	27.423	0.600	35.300	32.700	2.600	10.5	300	5.64	41.3
1.007	8	9	3.349	0.600	32.700	32.550	0.150	22.3	300	5.66	41.2
1.008	9	10	29.269	0.600	32.550	30.100	2.450	11.9	300	5.78	40.8
1.009	10	11	22.008	0.600	30.100	28.275	1.825	12.1	300	5.88	40.6
1.010	11	12	4.525	0.600	28.275	27.900	0.375	12.1	300	5.90	40.5
1.011	12	13	27.893	0.600	27.825	26.550	1.275	21.9	375	6.07	40.0
1.012	13	14	6.871	0.600	26.550	26.450	0.100	68.7	375	6.13	39.9
1.013	14	15	17.895	0.600	26.450	25.500	0.950	18.8	375	6.21	39.6
1.014	15	16	26.878	0.600	25.500	23.500	2.000	13.4	375	6.32	39.4
1.015	16	17	15.962	0.600	23.350	22.275	1.075	14.8	375	8.34	34.8

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	3.647	145.0	3.7	1.075	1.025	0.032	0.0	25	1.588
1.001	4.021	159.9	6.5	1.025	0.975	0.056	0.0	31	2.010
1.002	4.305	171.2	24.8	0.975	1.175	0.216	0.0	58	3.090
1.003	3.338	132.7	26.5	1.175	0.975	0.232	0.0	68	2.625
1.004	5.158	364.6	36.8	0.900	0.900	0.325	0.0	64	3.340
1.005	4.309	304.6	36.6	0.975	0.900	0.325	0.0	70	2.947
1.006	4.867	344.0	46.5	0.900	0.900	0.415	0.0	74	3.437
1.007	3.341	236.2	46.3	0.900	0.900	0.415	0.0	89	2.610
1.008	4.572	323.2	52.5	0.900	0.900	0.475	0.0	81	3.393
1.009	4.551	321.7	52.3	0.900	0.900	0.475	0.0	81	3.377
1.010	4.550	321.6	52.1	0.900	0.900	0.475	0.0	81	3.376
1.011	3.888	429.4	64.6	0.900	1.525	0.596	0.0	98	2.833
1.012	2.188	241.7	75.6	1.525	1.375	0.699	0.0	144	1.945
1.013	4.191	462.9	93.3	1.375	1.125	0.869	0.0	113	3.303
1.014	4.964	548.3	92.8	1.125	1.200	0.869	0.0	104	3.734
1.015	4.722	521.5	133.1	1.350	1.600	1.411	0.0	129	3.973

**Links**

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.016	17	18	8.725	0.600	21.500	21.300	0.200	43.6	375	8.40	34.7
1.017	18	18A	2.526	0.600	21.150	21.000	0.150	16.8	450	8.41	34.7
2.000	19	20	11.125	0.600	39.925	39.280	0.645	17.2	225	5.06	43.0
2.001	20	21	24.929	0.600	39.280	37.850	1.430	17.4	225	5.19	42.6
2.002	21	22	22.248	0.600	37.850	37.200	0.650	34.2	225	5.36	42.1
2.003	22	23	37.390	0.600	37.200	33.900	3.300	11.3	225	5.52	41.6
2.004	23	24	46.719	0.600	33.900	28.400	5.500	8.5	225	5.69	41.1
2.005	24	25	45.748	0.600	28.400	24.575	3.825	12.0	225	6.22	39.6
2.006	25	26	21.050	0.600	24.500	24.225	0.275	76.5	300	6.42	39.1
2.007	26	27	56.107	0.600	24.150	23.800	0.350	160.3	375	7.18	37.3
2.008	27	16	11.707	0.600	23.800	23.600	0.200	58.5	375	7.27	37.0
3.000	28	29	18.662	0.600	35.050	33.575	1.475	12.7	225	5.08	43.0
3.001	29	30	43.660	0.600	33.525	29.850	3.675	11.9	225	5.27	42.4
3.002	30	24	11.786	0.600	29.800	28.400	1.400	8.4	225	5.32	42.2
4.000	31	32	17.827	0.600	28.850	27.400	1.450	12.3	225	5.08	43.0
4.001	32	33	3.842	0.600	27.400	27.200	0.200	19.2	225	5.10	42.9
4.002	33	34	24.700	0.600	27.200	25.100	2.100	11.8	225	5.21	42.6
4.003	34	26	14.599	0.600	25.100	24.225	0.875	16.7	225	5.28	42.3
5.000	35	36	22.958	0.600	29.650	28.650	1.000	23.0	225	5.14	42.8
5.001	36	37	19.900	0.600	28.650	27.000	1.650	12.1	225	5.23	42.5

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.016	2.749	303.7	134.8	2.375	2.575	1.433	0.0	175	2.670
1.017	4.972	790.8	141.1	2.650	1.050	1.500	0.0	128	3.802
2.000	3.166	125.9	2.6	1.200	1.275	0.022	0.0	22	1.283
2.001	3.149	125.2	5.5	1.275	1.275	0.048	0.0	32	1.600
2.002	2.243	89.2	14.5	1.275	1.275	0.127	0.0	61	1.662
2.003	3.909	155.4	17.7	1.275	0.375	0.157	0.0	51	2.606
2.004	4.516	179.6	17.5	0.375	0.375	0.157	0.0	47	2.889
2.005	3.804	151.3	34.7	0.375	0.700	0.323	0.0	73	3.112
2.006	1.799	127.1	34.2	0.700	0.675	0.323	0.0	106	1.532
2.007	1.428	157.7	48.4	0.675	1.325	0.479	0.0	142	1.263
2.008	2.372	262.0	50.2	1.325	1.100	0.501	0.0	111	1.849
3.000	3.698	147.0	2.8	1.075	1.275	0.024	0.0	22	1.461
3.001	3.817	151.8	12.8	1.325	1.275	0.111	0.0	44	2.332
3.002	4.537	180.4	17.4	1.325	0.375	0.152	0.0	47	2.902
4.000	3.752	149.2	3.3	1.175	1.275	0.028	0.0	23	1.559
4.001	2.999	119.2	3.3	1.275	1.175	0.028	0.0	25	1.304
4.002	3.836	152.5	12.8	1.175	1.325	0.111	0.0	44	2.344
4.003	3.219	128.0	17.9	1.325	0.750	0.156	0.0	57	2.289
5.000	2.742	109.0	3.1	1.200	1.285	0.027	0.0	26	1.218
5.001	3.788	150.6	8.1	1.285	1.325	0.070	0.0	35	2.021

### Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
5.002	37	14	3.761	0.600	27.000	26.525	0.475	7.9	225	5.24	42.5
6.000	38	39	8.395	0.600	28.650	28.508	0.142	59.1	150	5.11	42.9
6.001	39	40	3.344	0.600	28.508	28.451	0.057	58.7	150	5.15	42.7
6.002	40	13	29.052	0.600	28.451	27.000	1.451	20.0	150	5.36	42.1
7.000	41	42	24.834	0.600	24.600	22.400	2.200	11.3	100	5.18	42.7
7.001	42	18	67.709	0.600	22.400	21.450	0.950	71.3	100	6.42	39.1
8.000	OC22	OC23	15.682	0.600	37.300	36.330	0.970	16.2	100	5.14	42.8
8.001	OC23	7	9.948	0.600	36.330	35.425	0.905	11.0	100	5.21	42.6

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
5.002	4.678	186.0	11.5	1.325	1.450	0.100	0.0	37	2.611
6.000	1.310	23.2	8.7	1.200	0.842	0.075	0.0	64	1.218
6.001	1.315	23.2	8.7	0.842	0.879	0.075	0.0	64	1.222
6.002	2.261	40.0	11.8	0.879	1.300	0.103	0.0	55	1.965
7.000	2.313	18.2	7.8	1.200	1.400	0.067	0.0	46	2.224
7.001	0.913	7.2	7.1	1.400	2.700	0.067	0.0	81	1.040
8.000	1.930	15.2	2.4	1.200	0.900	0.021	0.0	27	1.411
8.001	2.344	18.4	5.7	0.900	0.975	0.049	0.0	38	2.060

### Node 18A Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	21.000	Product Number	CTL-SHE-0136-7400-0290-7400
Design Depth (m)	0.290	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	7.4	Min Node Diameter (mm)	1200

### Node 18A Online Orifice Control

Flap Valve	x	Invert Level (m)	21.320	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.050		

### Node 18A Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )
0.000	941.0	0.0	1.500	1668.0	0.0	1.501	0.0	0.0

**Results for 1 year Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	1	10	47.726	0.026	4.1	0.0421	0.0000	OK
15 minute winter	2	10	46.932	0.032	7.2	0.0490	0.0000	OK
15 minute winter	3	10	46.461	0.061	27.6	0.2301	0.0000	OK
15 minute winter	4	10	41.277	0.077	29.5	0.1053	0.0000	OK
15 minute winter	5	10	40.519	0.069	41.0	0.1841	0.0000	OK
15 minute winter	6	10	36.303	0.078	40.4	0.0882	0.0000	OK
15 minute winter	7	11	35.378	0.078	51.8	0.1414	0.0000	OK
15 minute winter	8	11	32.824	0.124	51.6	0.1398	0.0000	OK
15 minute winter	9	11	32.640	0.090	59.1	0.1911	0.0000	OK
15 minute winter	10	11	30.187	0.087	59.3	0.0987	0.0000	OK
15 minute winter	11	11	28.383	0.108	59.5	0.1218	0.0000	OK
15 minute winter	12	11	27.929	0.104	74.3	0.3163	0.0000	OK
15 minute winter	13	11	26.734	0.184	87.2	0.2077	0.0000	OK
15 minute winter	14	11	26.585	0.135	108.1	0.2600	0.0000	OK
15 minute winter	15	11	25.619	0.119	108.2	0.1341	0.0000	OK
15 minute winter	16	11	23.519	0.169	174.9	0.2717	0.0000	OK
15 minute winter	17	9	23.036	1.536	178.1	1.9836	0.0000	SURCHARGED
15 minute winter	18	9	22.967	1.817	207.3	3.2100	0.0000	SURCHARGED
960 minute winter	18A	675	21.240	0.240	19.9	240.8372	0.0000	OK
15 minute winter	19	10	39.948	0.023	2.8	0.0334	0.0000	OK
15 minute winter	20	10	39.314	0.034	6.1	0.0495	0.0000	OK
15 minute winter	21	10	37.918	0.068	16.1	0.1486	0.0000	OK
15 minute winter	22	10	37.256	0.056	19.7	0.0850	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	1	1.000	2	4.1	1.359	0.028	0.0313	
15 minute winter	2	1.001	3	7.1	1.210	0.045	0.0323	
15 minute winter	3	1.002	4	27.4	2.656	0.160	0.5023	
15 minute winter	4	1.003	5	29.1	2.610	0.219	0.1298	
15 minute winter	5	1.004	6	40.4	3.396	0.111	0.4647	
15 minute winter	6	1.005	7	40.4	2.788	0.133	0.1804	
15 minute winter	7	1.006	8	51.6	2.502	0.150	0.5742	
15 minute winter	8	1.007	9	51.9	2.314	0.220	0.0754	
15 minute winter	9	1.008	10	59.3	3.422	0.184	0.5074	
15 minute winter	10	1.009	11	59.5	3.004	0.185	0.4371	
15 minute winter	11	1.010	12	59.7	3.019	0.186	0.0896	
15 minute winter	12	1.011	13	74.4	1.911	0.173	1.0966	
15 minute winter	13	1.012	14	87.4	1.964	0.362	0.3064	
15 minute winter	14	1.013	15	108.2	3.312	0.234	0.5854	
15 minute winter	15	1.014	16	108.3	3.779	0.198	0.7705	
15 minute winter	16	1.015	17	175.4	3.963	0.336	1.2367	
15 minute winter	17	1.016	18	199.7	2.494	0.658	0.9623	
15 minute winter	18	1.017	18A	234.7	3.221	0.297	0.2065	
960 minute winter	18A	Hydro-Brake®		7.4				367.4
960 minute winter	18A	Orifice		0.0				0.0
15 minute winter	19	2.000	20	2.8	0.966	0.022	0.0324	
15 minute winter	20	2.001	21	6.0	0.900	0.048	0.1718	
15 minute winter	21	2.002	22	15.9	1.796	0.178	0.1970	
15 minute winter	22	2.003	23	19.5	2.773	0.125	0.2630	

**Results for 1 year Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	23	11	33.950	0.050	19.5	0.0565	0.0000	OK
15 minute winter	24	11	28.481	0.081	40.2	0.1290	0.0000	OK
15 minute winter	25	11	24.623	0.123	40.3	0.1393	0.0000	OK
15 minute winter	26	11	24.315	0.165	59.6	0.1871	0.0000	OK
15 minute winter	27	11	23.938	0.138	62.5	0.1921	0.0000	OK
15 minute winter	28	10	35.073	0.023	3.1	0.0341	0.0000	OK
15 minute winter	29	10	33.572	0.047	14.3	0.1051	0.0000	OK
15 minute winter	30	10	29.849	0.049	19.3	0.0820	0.0000	OK
15 minute winter	31	10	28.874	0.024	3.6	0.0368	0.0000	OK
15 minute winter	32	10	27.427	0.027	3.6	0.0301	0.0000	OK
15 minute winter	33	10	27.246	0.046	14.1	0.1065	0.0000	OK
15 minute winter	34	10	25.159	0.059	19.8	0.1017	0.0000	OK
15 minute winter	35	10	29.677	0.027	3.5	0.0415	0.0000	OK
15 minute winter	36	10	28.687	0.037	9.0	0.0629	0.0000	OK
15 minute winter	37	10	27.041	0.041	12.7	0.0623	0.0000	OK
15 minute winter	38	10	28.722	0.072	9.6	0.1612	0.0000	OK
15 minute winter	39	10	28.584	0.076	9.5	0.0862	0.0000	OK
15 minute winter	40	11	28.511	0.060	13.0	0.1001	0.0000	OK
15 minute winter	41	10	24.648	0.048	8.6	0.1044	0.0000	OK
15 minute winter	42	11	23.186	0.786	11.3	0.8887	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	23	2.004	24	19.5	2.046	0.109	0.4514	
15 minute winter	24	2.005	25	40.3	3.198	0.266	0.5764	
15 minute winter	25	2.006	26	40.4	1.553	0.318	0.5483	
15 minute winter	26	2.007	27	59.8	1.432	0.379	2.3465	
15 minute winter	27	2.008	16	61.7	1.818	0.235	0.3978	
15 minute winter	28	3.000	29	3.1	1.477	0.021	0.0386	
15 minute winter	29	3.001	30	14.0	2.381	0.092	0.2564	
15 minute winter	30	3.002	24	19.2	2.050	0.106	0.1125	
15 minute winter	31	4.000	32	3.6	1.463	0.024	0.0436	
15 minute winter	32	4.001	33	3.5	0.856	0.030	0.0162	
15 minute winter	33	4.002	34	14.0	1.989	0.092	0.1749	
15 minute winter	34	4.003	26	19.7	2.063	0.154	0.1686	
15 minute winter	35	5.000	36	3.5	0.995	0.032	0.0803	
15 minute winter	36	5.001	37	8.9	1.940	0.059	0.0913	
15 minute winter	37	5.002	14	12.7	2.286	0.068	0.0247	
15 minute winter	38	6.000	39	9.5	1.092	0.409	0.0728	
15 minute winter	39	6.001	40	9.4	1.208	0.403	0.0260	
15 minute winter	40	6.002	13	12.8	1.989	0.321	0.1872	
15 minute winter	41	7.000	42	8.5	1.517	0.469	0.1436	
15 minute winter	42	7.001	18	9.2	1.172	1.279	0.5298	

**Results for 1 year Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	OC22	10	37.329	0.029	2.7	0.0222	0.0000	OK
15 minute winter	OC23	10	36.372	0.042	6.3	0.0425	0.0000	OK

  

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	OC22	8.000	OC23	2.7	1.086	0.176	0.0388	
15 minute winter	OC23	8.001	7	6.2	2.053	0.337	0.0300	



**Results for 2 year Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	1	10	47.729	0.029	5.3	0.0476	0.0000	OK
15 minute winter	2	10	46.937	0.037	9.3	0.0554	0.0000	OK
15 minute winter	3	10	46.469	0.069	35.7	0.2625	0.0000	OK
15 minute winter	4	10	41.290	0.090	38.1	0.1221	0.0000	OK
15 minute winter	5	10	40.528	0.078	53.0	0.2104	0.0000	OK
15 minute winter	6	10	36.315	0.090	52.4	0.1017	0.0000	OK
15 minute winter	7	11	35.389	0.089	67.0	0.1612	0.0000	OK
15 minute winter	8	11	32.846	0.146	66.7	0.1646	0.0000	OK
15 minute winter	9	11	32.653	0.103	76.5	0.2198	0.0000	OK
15 minute winter	10	11	30.200	0.100	76.8	0.1131	0.0000	OK
15 minute winter	11	11	28.402	0.127	77.0	0.1435	0.0000	OK
15 minute winter	12	11	27.944	0.119	96.1	0.3613	0.0000	OK
15 minute winter	13	11	26.765	0.215	112.9	0.2434	0.0000	OK
15 minute winter	14	11	26.607	0.157	139.9	0.3024	0.0000	OK
15 minute winter	15	11	25.637	0.137	140.1	0.1550	0.0000	OK
15 minute summer	16	10	23.570	0.220	217.2	0.3526	0.0000	OK
15 minute winter	17	9	23.300	1.800	230.9	2.3239	0.0000	SURCHARGED
15 minute winter	18	9	23.157	2.007	257.2	3.5459	0.0000	SURCHARGED
720 minute winter	18A	540	21.296	0.296	45.2	300.4699	0.0000	OK
15 minute winter	19	10	39.951	0.026	3.6	0.0376	0.0000	OK
15 minute winter	20	10	39.318	0.038	7.9	0.0562	0.0000	OK
15 minute winter	21	10	37.928	0.078	20.9	0.1709	0.0000	OK
15 minute winter	22	10	37.264	0.064	25.6	0.0974	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	1	1.000	2	5.3	1.468	0.036	0.0375	
15 minute winter	2	1.001	3	9.2	1.300	0.058	0.0388	
15 minute winter	3	1.002	4	35.4	2.827	0.207	0.6097	
15 minute winter	4	1.003	5	37.6	2.783	0.284	0.1575	
15 minute winter	5	1.004	6	52.4	3.648	0.144	0.5602	
15 minute winter	6	1.005	7	52.2	2.977	0.172	0.2188	
15 minute winter	7	1.006	8	66.7	2.635	0.194	0.7036	
15 minute winter	8	1.007	9	67.1	2.434	0.284	0.0926	
15 minute winter	9	1.008	10	76.8	3.659	0.238	0.6142	
15 minute winter	10	1.009	11	77.0	3.160	0.240	0.5377	
15 minute winter	11	1.010	12	77.2	3.180	0.240	0.1101	
15 minute winter	12	1.011	13	96.3	2.027	0.224	1.3319	
15 minute winter	13	1.012	14	113.1	2.077	0.468	0.3743	
15 minute winter	14	1.013	15	140.1	3.507	0.303	0.7155	
15 minute winter	15	1.014	16	140.3	4.038	0.256	0.9340	
15 minute summer	16	1.015	17	208.7	4.127	0.400	1.4151	
15 minute winter	17	1.016	18	248.3	2.619	0.818	0.9623	
15 minute winter	18	1.017	18A	278.8	3.415	0.353	0.2105	
720 minute winter	18A	Hydro-Brake®		7.5				312.7
720 minute winter	18A	Orifice		0.0				0.0
15 minute winter	19	2.000	20	3.6	1.036	0.028	0.0388	
15 minute winter	20	2.001	21	7.8	0.962	0.062	0.2079	
15 minute winter	21	2.002	22	20.6	1.923	0.231	0.2388	
15 minute winter	22	2.003	23	25.3	2.985	0.163	0.3178	

**Results for 2 year Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	23	11	33.957	0.057	25.3	0.0643	0.0000	OK
15 minute winter	24	11	28.493	0.093	52.1	0.1489	0.0000	OK
15 minute winter	25	11	24.644	0.144	52.2	0.1624	0.0000	OK
15 minute winter	26	11	24.342	0.192	77.2	0.2174	0.0000	OK
15 minute winter	27	11	23.961	0.161	81.0	0.2244	0.0000	OK
15 minute winter	28	10	35.076	0.026	4.0	0.0386	0.0000	OK
15 minute winter	29	10	33.578	0.053	18.3	0.1196	0.0000	OK
15 minute winter	30	10	29.856	0.056	24.8	0.0931	0.0000	OK
15 minute winter	31	10	28.877	0.027	4.6	0.0414	0.0000	OK
15 minute winter	32	10	27.430	0.030	4.6	0.0339	0.0000	OK
15 minute winter	33	10	27.252	0.052	18.3	0.1213	0.0000	OK
15 minute winter	34	10	25.168	0.068	25.7	0.1162	0.0000	OK
15 minute winter	35	10	29.681	0.031	4.5	0.0467	0.0000	OK
15 minute winter	36	10	28.692	0.042	11.5	0.0715	0.0000	OK
15 minute winter	37	10	27.046	0.046	16.4	0.0692	0.0000	OK
15 minute winter	38	10	28.735	0.085	12.4	0.1905	0.0000	OK
15 minute winter	39	10	28.598	0.090	12.2	0.1014	0.0000	OK
15 minute winter	40	11	28.520	0.069	16.7	0.1159	0.0000	OK
15 minute winter	41	11	24.663	0.063	11.1	0.1363	0.0000	OK
15 minute winter	42	12	23.554	1.154	12.7	1.3052	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	23	2.004	24	25.3	2.194	0.141	0.5460	
15 minute winter	24	2.005	25	52.2	3.424	0.345	0.6973	
15 minute winter	25	2.006	26	52.4	1.654	0.412	0.6669	
15 minute winter	26	2.007	27	77.6	1.520	0.492	2.8665	
15 minute winter	27	2.008	16	80.3	1.936	0.307	0.4859	
15 minute winter	28	3.000	29	3.9	1.593	0.027	0.0461	
15 minute winter	29	3.001	30	18.0	2.560	0.119	0.3075	
15 minute winter	30	3.002	24	24.7	2.185	0.137	0.1360	
15 minute winter	31	4.000	32	4.6	1.574	0.031	0.0518	
15 minute winter	32	4.001	33	4.5	0.919	0.038	0.0194	
15 minute winter	33	4.002	34	18.2	2.144	0.119	0.2107	
15 minute winter	34	4.003	26	25.5	2.044	0.199	0.2244	
15 minute winter	35	5.000	36	4.4	1.067	0.041	0.0963	
15 minute winter	36	5.001	37	11.4	2.104	0.076	0.1080	
15 minute winter	37	5.002	14	16.4	2.268	0.088	0.0348	
15 minute winter	38	6.000	39	12.2	1.151	0.529	0.0893	
15 minute winter	39	6.001	40	12.1	1.282	0.522	0.0316	
15 minute winter	40	6.002	13	16.6	2.124	0.415	0.2266	
15 minute winter	41	7.000	42	10.7	1.597	0.588	0.1617	
15 minute winter	42	7.001	18	10.2	1.305	1.424	0.5298	

**Results for 2 year Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	OC22	10	37.333	0.033	3.5	0.0255	0.0000	OK
15 minute winter	OC23	10	36.379	0.049	8.1	0.0494	0.0000	OK

  

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	OC22	8.000	OC23	3.5	1.162	0.229	0.0470	
15 minute winter	OC23	8.001	7	8.0	2.187	0.435	0.0364	

**Results for 30 year Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	1	10	47.740	0.040	10.0	0.0647	0.0000	OK
15 minute winter	2	10	46.950	0.050	17.5	0.0757	0.0000	OK
15 minute winter	3	10	46.497	0.097	67.6	0.3695	0.0000	OK
15 minute winter	4	10	41.335	0.135	72.1	0.1833	0.0000	OK
15 minute winter	5	10	40.561	0.111	100.5	0.2970	0.0000	OK
15 minute winter	6	10	36.356	0.131	99.6	0.1484	0.0000	OK
15 minute winter	7	10	35.425	0.125	127.5	0.2268	0.0000	OK
15 minute winter	8	11	32.926	0.226	126.9	0.2553	0.0000	OK
15 minute winter	9	11	32.699	0.149	144.7	0.3172	0.0000	OK
15 minute winter	10	11	30.243	0.143	144.9	0.1619	0.0000	OK
15 minute winter	11	11	28.473	0.198	145.6	0.2240	0.0000	OK
15 minute winter	12	11	27.993	0.168	181.9	0.5096	0.0000	OK
15 minute winter	13	11	26.891	0.340	213.0	0.3851	0.0000	OK
15 minute winter	14	11	26.690	0.240	264.4	0.4628	0.0000	OK
30 minute summer	15	18	25.689	0.189	240.8	0.2141	0.0000	OK
15 minute winter	16	10	24.224	0.874	435.9	1.4037	0.0000	SURCHARGED
15 minute winter	17	8	23.760	2.260	450.6	2.9171	0.0000	SURCHARGED
15 minute winter	18	8	23.545	2.395	465.0	4.2320	0.0000	SURCHARGED
720 minute winter	18A	555	21.513	0.513	104.8	548.4739	0.0000	OK
15 minute winter	19	10	39.961	0.036	6.9	0.0513	0.0000	OK
15 minute winter	20	10	39.332	0.052	15.1	0.0773	0.0000	OK
15 minute winter	21	10	37.963	0.113	39.7	0.2472	0.0000	OK
15 minute winter	22	10	37.290	0.090	48.6	0.1378	0.0000	OK

  

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	1	1.000	2	10.0	1.774	0.069	0.0586	
15 minute winter	2	1.001	3	17.4	1.543	0.109	0.0615	
15 minute winter	3	1.002	4	67.1	3.252	0.392	1.0023	
15 minute winter	4	1.003	5	71.4	3.223	0.538	0.2575	
15 minute winter	5	1.004	6	99.6	4.339	0.273	0.8953	
15 minute winter	6	1.005	7	99.4	3.467	0.326	0.3569	
15 minute winter	7	1.006	8	126.9	2.973	0.369	1.1589	
15 minute winter	8	1.007	9	126.7	2.739	0.536	0.1536	
15 minute winter	9	1.008	10	144.9	4.262	0.448	0.9956	
15 minute winter	10	1.009	11	145.6	3.521	0.453	0.9078	
15 minute winter	11	1.010	12	146.1	3.567	0.454	0.1849	
15 minute winter	12	1.011	13	182.3	2.300	0.425	2.1345	
15 minute winter	13	1.012	14	213.7	2.335	0.884	0.6168	
15 minute winter	14	1.013	15	264.7	4.095	0.572	1.1551	
30 minute summer	15	1.014	16	239.8	4.583	0.437	1.4065	
15 minute winter	16	1.015	17	445.2	4.679	0.854	1.7606	
15 minute winter	17	1.016	18	455.1	4.126	1.499	0.9623	
15 minute winter	18	1.017	18A	471.9	4.333	0.597	0.2543	
720 minute winter	18A	Hydro-Brake®		9.7				401.9
720 minute winter	18A	Orifice		2.1				58.8
15 minute winter	19	2.000	20	6.9	1.260	0.055	0.0612	
15 minute winter	20	2.001	21	14.9	1.128	0.119	0.3363	
15 minute winter	21	2.002	22	39.2	2.254	0.439	0.3872	
15 minute winter	22	2.003	23	48.2	3.548	0.310	0.5083	

**Results for 30 year Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	23	11	33.979	0.079	48.2	0.0893	0.0000	OK
15 minute winter	24	10	28.534	0.134	99.2	0.2139	0.0000	OK
15 minute winter	25	11	24.898	0.398	99.1	0.4504	0.0000	SURCHARGED
15 minute winter	26	11	24.670	0.520	146.5	0.5885	0.0000	SURCHARGED
15 minute winter	27	10	24.323	0.523	162.2	0.7267	0.0000	SURCHARGED
15 minute winter	28	10	35.085	0.035	7.5	0.0526	0.0000	OK
15 minute winter	29	10	33.599	0.074	34.7	0.1670	0.0000	OK
15 minute winter	30	10	29.878	0.078	47.2	0.1295	0.0000	OK
15 minute winter	31	10	28.887	0.037	8.8	0.0565	0.0000	OK
15 minute winter	32	10	27.442	0.042	8.7	0.0476	0.0000	OK
15 minute winter	33	10	27.273	0.073	34.8	0.1681	0.0000	OK
15 minute winter	34	11	25.198	0.098	48.7	0.1671	0.0000	OK
15 minute winter	35	10	29.692	0.042	8.5	0.0637	0.0000	OK
15 minute winter	36	10	28.708	0.058	21.9	0.0992	0.0000	OK
15 minute winter	37	10	27.064	0.064	31.2	0.0976	0.0000	OK
15 minute winter	38	11	28.834	0.184	23.5	0.4136	0.0000	SURCHARGED
15 minute winter	39	11	28.657	0.149	22.4	0.1682	0.0000	OK
15 minute winter	40	11	28.554	0.103	30.6	0.1731	0.0000	OK
15 minute winter	41	13	25.443	0.843	21.0	1.8234	0.0000	SURCHARGED
15 minute winter	42	9	23.900	1.500	16.5	1.6965	1.5725	FLOOD

  

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	23	2.004	24	47.9	2.635	0.267	0.8640	
15 minute winter	24	2.005	25	99.1	3.834	0.655	1.4599	
15 minute winter	25	2.006	26	106.5	1.802	0.838	1.4823	
15 minute winter	26	2.007	27	156.8	1.666	0.994	6.1884	
15 minute winter	27	2.008	16	180.1	2.275	0.688	1.2912	
15 minute winter	28	3.000	29	7.4	1.923	0.051	0.0721	
15 minute winter	29	3.001	30	34.3	3.062	0.226	0.4888	
15 minute winter	30	3.002	24	47.1	2.563	0.261	0.2170	
15 minute winter	31	4.000	32	8.7	1.874	0.059	0.0834	
15 minute winter	32	4.001	33	8.7	1.091	0.073	0.0311	
15 minute winter	33	4.002	34	34.6	2.556	0.227	0.3359	
15 minute winter	34	4.003	26	47.5	2.133	0.371	0.4107	
15 minute winter	35	5.000	36	8.4	1.278	0.077	0.1525	
15 minute winter	36	5.001	37	21.8	2.490	0.144	0.1739	
15 minute winter	37	5.002	14	31.0	2.390	0.167	0.0755	
15 minute winter	38	6.000	39	22.4	1.270	0.965	0.1477	
15 minute winter	39	6.001	40	22.3	1.443	0.960	0.0510	
15 minute winter	40	6.002	13	30.7	2.434	0.768	0.3661	
15 minute winter	41	7.000	42	14.1	1.802	0.776	0.1943	
15 minute winter	42	7.001	18	11.1	1.412	1.541	0.5298	

**Results for 30 year Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	OC22	10	37.346	0.046	6.6	0.0359	0.0000	OK
15 minute winter	OC23	10	36.406	0.076	15.4	0.0774	0.0000	OK

  

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	OC22	8.000	OC23	6.6	1.306	0.432	0.0778	
15 minute winter	OC23	8.001	7	15.2	2.484	0.824	0.0607	

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	1	10	47.754	0.054	18.2	0.0875	0.0000	OK
15 minute winter	2	10	46.969	0.069	31.7	0.1050	0.0000	OK
15 minute winter	3	10	46.539	0.139	122.5	0.5284	0.0000	OK
15 minute winter	4	11	41.662	0.462	130.8	0.6283	0.0000	SURCHARGED
15 minute winter	5	11	40.604	0.154	175.5	0.4134	0.0000	OK
15 minute winter	6	11	36.418	0.193	175.8	0.2177	0.0000	OK
15 minute winter	7	11	35.474	0.174	220.3	0.3147	0.0000	OK
15 minute winter	8	11	33.197	0.497	220.5	0.5618	0.0000	SURCHARGED
15 minute winter	9	10	32.762	0.212	252.5	0.4519	0.0000	OK
15 minute winter	10	12	30.600	0.500	253.8	0.5656	0.0000	SURCHARGED
15 minute winter	11	12	29.249	0.974	246.0	1.1019	0.0000	FLOOD RISK
15 minute winter	12	12	28.741	0.916	304.0	2.7731	0.0000	SURCHARGED
15 minute winter	13	12	27.958	1.408	327.2	1.5919	0.0000	SURCHARGED
15 minute winter	14	12	27.545	1.095	404.9	2.1135	0.0000	SURCHARGED
15 minute winter	15	12	26.448	0.948	405.5	1.0722	0.0000	SURCHARGED
15 minute winter	16	9	25.063	1.713	536.1	2.7515	0.0000	FLOOD RISK
15 minute winter	17	7	24.126	2.626	545.3	3.3902	0.0000	FLOOD RISK
15 minute winter	18	7	23.873	2.723	556.9	4.8120	0.0000	SURCHARGED
720 minute winter	18A	585	21.897	0.897	85.9	1042.3200	0.0000	OK
15 minute winter	19	10	39.973	0.048	12.5	0.0686	0.0000	OK
15 minute winter	20	10	39.351	0.071	27.2	0.1046	0.0000	OK
15 minute winter	21	10	38.021	0.171	72.0	0.3730	0.0000	OK
15 minute winter	22	10	37.329	0.129	88.0	0.1968	0.0000	OK

  

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	1	1.000	2	18.1	2.061	0.125	0.0918	
15 minute winter	2	1.001	3	31.6	1.758	0.198	0.0967	
15 minute winter	3	1.002	4	121.7	3.475	0.711	1.5925	
15 minute winter	4	1.003	5	125.7	3.392	0.947	0.4001	
15 minute winter	5	1.004	6	175.8	5.002	0.482	1.3707	
15 minute winter	6	1.005	7	175.9	3.909	0.578	0.5596	
15 minute winter	7	1.006	8	220.5	3.494	0.641	1.5444	
15 minute winter	8	1.007	9	220.4	3.308	0.933	0.2071	
15 minute winter	9	1.008	10	253.8	4.599	0.785	1.7442	
15 minute winter	10	1.009	11	246.0	3.670	0.765	1.5498	
15 minute winter	11	1.010	12	240.3	3.661	0.747	0.3186	
15 minute winter	12	1.011	13	291.1	2.640	0.678	3.0765	
15 minute winter	13	1.012	14	329.0	2.983	1.361	0.7579	
15 minute winter	14	1.013	15	405.5	3.920	0.876	1.9738	
15 minute winter	15	1.014	16	405.9	4.134	0.740	2.9646	
15 minute winter	16	1.015	17	538.1	4.879	1.032	1.7606	
15 minute winter	17	1.016	18	546.9	4.959	1.801	0.9623	
15 minute winter	18	1.017	18A	559.4	4.884	0.707	0.3220	
720 minute winter	18A	Hydro-Brake®		12.6				538.7
720 minute winter	18A	Orifice		3.9				133.7
15 minute winter	19	2.000	20	12.4	1.496	0.099	0.0934	
15 minute winter	20	2.001	21	27.1	1.247	0.216	0.5362	
15 minute winter	21	2.002	22	70.9	2.533	0.795	0.6204	
15 minute winter	22	2.003	23	87.4	4.101	0.562	0.7966	

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	23	10	34.010	0.110	87.4	0.1239	0.0000	OK
15 minute winter	24	10	29.000	0.600	179.9	0.9588	6.3895	FLOOD
30 minute winter	25	17	25.500	1.000	140.0	1.1310	6.9998	FLOOD
15 minute winter	26	8	25.200	1.050	200.2	1.1876	33.4925	FLOOD
15 minute summer	27	9	25.123	1.323	166.5	1.8387	0.0000	SURCHARGED
15 minute winter	28	10	35.096	0.046	13.6	0.0690	0.0000	OK
15 minute winter	29	10	33.628	0.103	63.0	0.2327	0.0000	OK
15 minute winter	30	10	29.920	0.120	85.5	0.1998	0.0000	OK
15 minute winter	31	10	28.899	0.049	15.9	0.0755	0.0000	OK
15 minute winter	32	10	27.460	0.060	15.8	0.0680	0.0000	OK
15 minute winter	33	10	27.300	0.100	62.9	0.2314	0.0000	OK
15 minute winter	34	11	25.733	0.633	88.2	1.0842	0.0000	SURCHARGED
15 minute winter	35	10	29.707	0.057	15.3	0.0854	0.0000	OK
15 minute winter	36	10	28.728	0.078	39.6	0.1329	0.0000	OK
15 minute winter	37	12	27.611	0.611	56.4	0.9270	0.0000	SURCHARGED
15 minute winter	38	12	29.829	1.179	42.6	2.6424	0.0000	FLOOD RISK
15 minute winter	39	12	29.500	0.992	31.8	1.1220	0.2621	FLOOD
15 minute winter	40	12	29.357	0.906	43.7	1.5182	0.0000	FLOOD RISK
30 minute winter	41	17	25.900	1.300	31.0	2.8106	3.7261	FLOOD
15 minute winter	42	7	23.900	1.500	19.3	1.6965	4.4755	FLOOD

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	23	2.004	24	86.7	2.729	0.483	1.3769	
15 minute winter	24	2.005	25	136.7	3.812	0.904	1.8194	
30 minute winter	25	2.006	26	116.2	1.761	0.914	1.4823	
15 minute winter	26	2.007	27	142.9	1.668	0.906	6.1884	
15 minute summer	27	2.008	16	209.1	2.424	0.798	1.2912	
15 minute winter	28	3.000	29	13.5	2.132	0.092	0.1210	
15 minute winter	29	3.001	30	62.2	3.581	0.410	0.7585	
15 minute winter	30	3.002	24	85.2	2.842	0.472	0.3617	
15 minute winter	31	4.000	32	15.8	2.126	0.106	0.1331	
15 minute winter	32	4.001	33	15.7	1.243	0.132	0.0490	
15 minute winter	33	4.002	34	62.6	2.572	0.411	0.7012	
15 minute winter	34	4.003	26	85.8	2.157	0.670	0.5806	
15 minute winter	35	5.000	36	15.2	1.525	0.139	0.2300	
15 minute winter	36	5.001	37	39.3	2.616	0.261	0.5175	
15 minute winter	37	5.002	14	47.3	2.265	0.254	0.1496	
15 minute winter	38	6.000	39	31.8	1.804	1.372	0.1478	
15 minute winter	39	6.001	40	30.0	1.706	1.292	0.0589	
15 minute winter	40	6.002	13	42.4	2.461	1.061	0.5115	
30 minute winter	41	7.000	42	16.0	2.050	0.883	0.1943	
15 minute winter	42	7.001	18	11.1	1.412	1.541	0.5298	



**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.66%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	OC22	12	37.629	0.329	11.9	0.2566	0.0000	SURCHARGED
15 minute winter	OC23	12	37.171	0.841	25.5	0.8549	0.0000	FLOOD RISK

  

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	OC22	8.000	OC23	10.5	1.433	0.696	0.1227	
15 minute winter	OC23	8.001	7	22.6	2.895	1.230	0.0777	

**Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.98%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
360 minute summer	1	184	47.726	0.026	4.2	0.0427	0.0000	OK
360 minute summer	2	184	46.933	0.033	7.4	0.0498	0.0000	OK
360 minute summer	3	184	46.462	0.062	28.5	0.2345	0.0000	OK
360 minute summer	4	184	41.279	0.079	30.5	0.1077	0.0000	OK
360 minute summer	5	184	40.520	0.070	42.7	0.1888	0.0000	OK
360 minute summer	6	184	36.305	0.080	42.6	0.0907	0.0000	OK
360 minute summer	7	184	35.380	0.080	54.4	0.1451	0.0000	OK
360 minute summer	8	184	32.827	0.127	54.3	0.1438	0.0000	OK
360 minute summer	9	184	32.642	0.092	62.1	0.1960	0.0000	OK
360 minute summer	10	184	30.189	0.089	62.0	0.1009	0.0000	OK
360 minute summer	11	184	28.385	0.110	61.9	0.1245	0.0000	OK
360 minute summer	12	184	27.932	0.107	77.8	0.3233	0.0000	OK
360 minute summer	13	184	26.738	0.188	91.1	0.2129	0.0000	OK
360 minute summer	14	184	26.588	0.138	113.3	0.2671	0.0000	OK
360 minute summer	15	184	25.621	0.121	113.2	0.1373	0.0000	OK
360 minute summer	16	184	23.523	0.173	182.9	0.2784	0.0000	OK
360 minute summer	17	360	21.782	0.282	185.5	0.3644	0.0000	OK
360 minute summer	18	360	21.782	0.632	193.0	1.1161	0.0000	SURCHARGED
360 minute summer	18A	360	21.781	0.781	192.6	885.8227	0.0000	OK

360 minute summer	19	184	39.949	0.024	2.9	0.0340	0.0000	OK
360 minute summer	20	184	39.314	0.034	6.3	0.0505	0.0000	OK
360 minute summer	21	184	37.920	0.070	16.7	0.1519	0.0000	OK
360 minute summer	22	184	37.257	0.057	20.6	0.0872	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
360 minute summer	1	1.000	2	4.2	1.369	0.029	0.0320	
360 minute summer	2	1.001	3	7.4	1.220	0.046	0.0332	
360 minute summer	3	1.002	4	28.4	2.676	0.166	0.5173	
360 minute summer	4	1.003	5	30.4	2.638	0.229	0.1342	
360 minute summer	5	1.004	6	42.6	3.445	0.117	0.4818	
360 minute summer	6	1.005	7	42.5	2.821	0.140	0.1875	
360 minute summer	7	1.006	8	54.3	2.520	0.158	0.5960	
360 minute summer	8	1.007	9	54.2	2.329	0.229	0.0782	
360 minute summer	9	1.008	10	62.0	3.462	0.192	0.5242	
360 minute summer	10	1.009	11	61.9	3.029	0.192	0.4506	
360 minute summer	11	1.010	12	61.8	3.040	0.192	0.0922	
360 minute summer	12	1.011	13	77.6	1.932	0.181	1.1314	
360 minute summer	13	1.012	14	90.9	1.975	0.376	0.3168	
360 minute summer	14	1.013	15	113.2	3.344	0.244	0.6059	
360 minute summer	15	1.014	16	112.9	3.818	0.206	0.7949	
360 minute summer	16	1.015	17	182.6	4.000	0.350	0.7290	
360 minute summer	17	1.016	18	185.3	2.525	0.610	0.8694	
360 minute summer	18	1.017	18A	192.6	2.322	0.244	0.4002	
360 minute summer	18A	Hydro-Brake®		11.8				327.8
360 minute summer	18A	Orifice		3.4				79.6
360 minute summer	19	2.000	20	2.9	0.976	0.023	0.0333	
360 minute summer	20	2.001	21	6.3	0.909	0.050	0.1771	
360 minute summer	21	2.002	22	16.6	1.818	0.186	0.2036	
360 minute summer	22	2.003	23	20.5	2.809	0.132	0.2737	

**Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.98%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
360 minute summer	23	184	33.951	0.051	20.5	0.0578	0.0000	OK
360 minute summer	24	184	28.483	0.083	42.3	0.1322	0.0000	OK
360 minute summer	25	184	24.626	0.126	42.0	0.1423	0.0000	OK
360 minute summer	26	184	24.319	0.169	62.4	0.1911	0.0000	OK
360 minute summer	27	184	23.942	0.142	64.9	0.1969	0.0000	OK
360 minute summer	28	184	35.073	0.023	3.2	0.0348	0.0000	OK
360 minute summer	29	184	33.573	0.048	14.7	0.1074	0.0000	OK
360 minute summer	30	184	29.850	0.050	20.0	0.0836	0.0000	OK
360 minute summer	31	184	28.874	0.024	3.7	0.0374	0.0000	OK
360 minute summer	32	184	27.427	0.027	3.7	0.0307	0.0000	OK
360 minute summer	33	184	27.247	0.047	14.7	0.1088	0.0000	OK
360 minute summer	34	184	25.161	0.061	20.5	0.1039	0.0000	OK
360 minute summer	35	184	29.678	0.028	3.6	0.0422	0.0000	OK
360 minute summer	36	184	28.688	0.038	9.3	0.0643	0.0000	OK
360 minute summer	37	184	27.041	0.041	13.3	0.0628	0.0000	OK
360 minute summer	38	184	28.724	0.074	9.9	0.1651	0.0000	OK
360 minute summer	39	184	28.587	0.079	9.9	0.0888	0.0000	OK
360 minute summer	40	184	28.513	0.062	13.5	0.1031	0.0000	OK
360 minute summer	41	184	24.649	0.049	8.8	0.1063	0.0000	OK
360 minute summer	42	192	22.686	0.286	8.8	0.3237	0.0000	SURCHARGED
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
360 minute summer	23	2.004	24	20.5	2.074	0.114	0.4666	
360 minute summer	24	2.005	25	42.0	3.232	0.278	0.5950	
360 minute summer	25	2.006	26	41.9	1.565	0.329	0.5635	
360 minute summer	26	2.007	27	62.0	1.440	0.393	2.4190	
360 minute summer	27	2.008	16	64.6	1.838	0.246	0.4113	
360 minute summer	28	3.000	29	3.2	1.496	0.022	0.0397	
360 minute summer	29	3.001	30	14.6	2.413	0.096	0.2644	
360 minute summer	30	3.002	24	20.0	2.040	0.111	0.1169	
360 minute summer	31	4.000	32	3.7	1.473	0.025	0.0447	
360 minute summer	32	4.001	33	3.7	0.865	0.031	0.0167	
360 minute summer	33	4.002	34	14.6	2.016	0.096	0.1803	
360 minute summer	34	4.003	26	20.5	1.887	0.160	0.1774	
360 minute summer	35	5.000	36	3.6	1.002	0.033	0.0828	
360 minute summer	36	5.001	37	9.3	1.978	0.061	0.0933	
360 minute summer	37	5.002	14	13.2	2.196	0.071	0.0266	
360 minute summer	38	6.000	39	9.9	1.100	0.426	0.0753	
360 minute summer	39	6.001	40	9.8	1.220	0.423	0.0270	
360 minute summer	40	6.002	13	13.5	2.013	0.337	0.1945	
360 minute summer	41	7.000	42	8.8	1.403	0.483	0.1447	
360 minute summer	42	7.001	18	7.7	1.022	1.078	0.5298	

**Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.98%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
360 minute summer	OC22	184	37.329	0.029	2.8	0.0227	0.0000	OK
360 minute summer	OC23	184	36.373	0.043	6.5	0.0436	0.0000	OK

  

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
360 minute summer	OC22	8.000	OC23	2.8	1.100	0.184	0.0400	
360 minute summer	OC23	8.001	7	6.5	2.076	0.352	0.0310	

**Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 99.98%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
360 minute winter	1	184	47.723	0.023	3.1	0.0370	0.0000	OK
360 minute winter	2	184	46.928	0.028	5.4	0.0428	0.0000	OK
360 minute winter	3	184	46.453	0.053	20.8	0.2003	0.0000	OK
360 minute winter	4	184	41.267	0.067	22.3	0.0905	0.0000	OK
360 minute winter	5	184	40.510	0.060	31.2	0.1610	0.0000	OK
360 minute winter	6	184	36.293	0.068	31.1	0.0766	0.0000	OK
360 minute winter	7	184	35.368	0.068	39.7	0.1240	0.0000	OK
360 minute winter	8	184	32.805	0.105	39.7	0.1187	0.0000	OK
360 minute winter	9	184	32.628	0.078	45.5	0.1663	0.0000	OK
360 minute winter	10	184	30.176	0.076	45.5	0.0860	0.0000	OK
360 minute winter	11	184	28.366	0.091	45.5	0.1031	0.0000	OK
360 minute winter	12	184	27.916	0.091	57.1	0.2766	0.0000	OK
360 minute winter	13	184	26.707	0.157	66.9	0.1773	0.0000	OK
360 minute winter	14	184	26.566	0.116	83.2	0.2243	0.0000	OK
360 minute winter	15	184	25.603	0.103	83.1	0.1161	0.0000	OK
360 minute winter	16	184	23.494	0.144	134.9	0.2311	0.0000	OK
360 minute winter	17	344	21.875	0.375	136.9	0.4844	0.0000	SURCHARGED
360 minute winter	18	352	21.875	0.725	143.3	1.2810	0.0000	SURCHARGED
360 minute winter	18A	352	21.874	0.874	142.6	1010.7970	0.0000	OK
360 minute winter	19	184	39.945	0.020	2.1	0.0292	0.0000	OK
360 minute winter	20	184	39.309	0.029	4.6	0.0435	0.0000	OK
360 minute winter	21	184	37.909	0.059	12.2	0.1291	0.0000	OK
360 minute winter	22	184	37.249	0.049	15.1	0.0745	0.0000	OK
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
360 minute winter	1	1.000	2	3.1	1.255	0.021	0.0258	
360 minute winter	2	1.001	3	5.4	1.114	0.034	0.0266	
360 minute winter	3	1.002	4	20.8	2.472	0.121	0.4100	
360 minute winter	4	1.003	5	22.3	2.436	0.168	0.1064	
360 minute winter	5	1.004	6	31.1	3.155	0.085	0.3851	
360 minute winter	6	1.005	7	31.1	2.602	0.102	0.1489	
360 minute winter	7	1.006	8	39.7	2.360	0.115	0.4660	
360 minute winter	8	1.007	9	39.7	2.188	0.168	0.0611	
360 minute winter	9	1.008	10	45.5	3.187	0.141	0.4179	
360 minute winter	10	1.009	11	45.5	2.840	0.141	0.3531	
360 minute winter	11	1.010	12	45.5	2.848	0.141	0.0724	
360 minute winter	12	1.011	13	57.0	1.795	0.133	0.8972	
360 minute winter	13	1.012	14	66.9	1.847	0.277	0.2496	
360 minute winter	14	1.013	15	83.1	3.114	0.180	0.4782	
360 minute winter	15	1.014	16	83.1	3.525	0.152	0.6339	
360 minute winter	16	1.015	17	134.8	3.735	0.259	0.5765	
360 minute winter	17	1.016	18	136.8	2.358	0.451	0.9620	
360 minute winter	18	1.017	18A	142.6	2.409	0.180	0.4002	
360 minute winter	18A	Hydro-Brake®		12.4				346.9
360 minute winter	18A	Orifice		3.8				88.8
360 minute winter	19	2.000	20	2.1	0.893	0.017	0.0267	
360 minute winter	20	2.001	21	4.6	0.835	0.037	0.1414	
360 minute winter	21	2.002	22	12.2	1.674	0.137	0.1624	
360 minute winter	22	2.003	23	15.1	2.571	0.097	0.2193	

**Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 99.98%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
360 minute winter	23	184	33.944	0.044	15.1	0.0497	0.0000	OK
360 minute winter	24	184	28.470	0.070	30.9	0.1120	0.0000	OK
360 minute winter	25	184	24.606	0.106	30.9	0.1196	0.0000	OK
360 minute winter	26	184	24.293	0.143	45.9	0.1613	0.0000	OK
360 minute winter	27	184	23.919	0.119	47.9	0.1657	0.0000	OK
360 minute winter	28	184	35.070	0.020	2.3	0.0298	0.0000	OK
360 minute winter	29	184	33.566	0.041	10.7	0.0919	0.0000	OK
360 minute winter	30	184	29.843	0.043	14.6	0.0716	0.0000	OK
360 minute winter	31	184	28.871	0.021	2.7	0.0322	0.0000	OK
360 minute winter	32	184	27.423	0.023	2.7	0.0265	0.0000	OK
360 minute winter	33	184	27.240	0.040	10.7	0.0933	0.0000	OK
360 minute winter	34	184	25.152	0.052	15.0	0.0887	0.0000	OK
360 minute winter	35	184	29.674	0.024	2.6	0.0363	0.0000	OK
360 minute winter	36	184	28.682	0.032	6.7	0.0549	0.0000	OK
360 minute winter	37	184	27.037	0.037	9.6	0.0556	0.0000	OK
360 minute winter	38	184	28.711	0.061	7.2	0.1363	0.0000	OK
360 minute winter	39	184	28.573	0.065	7.2	0.0735	0.0000	OK
360 minute winter	40	184	28.503	0.052	9.9	0.0869	0.0000	OK
360 minute winter	41	184	24.641	0.041	6.4	0.0889	0.0000	OK
360 minute winter	42	184	22.474	0.074	6.4	0.0842	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
360 minute winter	23	2.004	24	15.1	1.910	0.084	0.3732	
360 minute winter	24	2.005	25	30.9	2.975	0.204	0.4754	
360 minute winter	25	2.006	26	30.9	1.449	0.243	0.4487	
360 minute winter	26	2.007	27	45.8	1.339	0.290	1.9218	
360 minute winter	27	2.008	16	47.8	1.709	0.183	0.3279	
360 minute winter	28	3.000	29	2.3	1.361	0.016	0.0315	
360 minute winter	29	3.001	30	10.7	2.202	0.070	0.2118	
360 minute winter	30	3.002	24	14.6	1.866	0.081	0.0933	
360 minute winter	31	4.000	32	2.7	1.338	0.018	0.0359	
360 minute winter	32	4.001	33	2.7	0.789	0.023	0.0134	
360 minute winter	33	4.002	34	10.7	1.837	0.070	0.1443	
360 minute winter	34	4.003	26	15.0	1.898	0.117	0.1234	
360 minute winter	35	5.000	36	2.6	0.911	0.024	0.0658	
360 minute winter	36	5.001	37	6.7	1.749	0.044	0.0763	
360 minute winter	37	5.002	14	9.6	2.223	0.052	0.0172	
360 minute winter	38	6.000	39	7.2	1.028	0.311	0.0588	
360 minute winter	39	6.001	40	7.2	1.132	0.309	0.0213	
360 minute winter	40	6.002	13	9.9	1.853	0.247	0.1549	
360 minute winter	41	7.000	42	6.4	1.374	0.352	0.1152	
360 minute winter	42	7.001	18	6.4	1.024	0.897	0.4715	

**Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 99.98%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
360 minute winter	OC22	184	37.325	0.025	2.0	0.0192	0.0000	OK
360 minute winter	OC23	184	36.366	0.036	4.7	0.0364	0.0000	OK

  

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
360 minute winter	OC22	8.000	OC23	2.0	1.013	0.132	0.0315	
360 minute winter	OC23	8.001	7	4.7	1.912	0.255	0.0245	