

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	0.344	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)	Depth (m)
S1	0.044	5.00	139.200	1200	1.200
S2	0.050	5.00	138.250	120	1.250
S3	0.120	5.00	138.800	1200	2.010
S4	0.100	5.00	139.500	1200	2.940
S5	0.036	5.00	140.315	1200	4.015
S6	0.022	5.00	139.800	1800	3.990
S7	0.040	5.00	147.920	1200	1.920
S8	0.050	5.00	146.900	1200	1.900
S9	0.060	5.00	145.900	1200	1.900
S10	0.100	5.00	146.700	1200	0.700
S11	0.160	5.00	144.600	1200	1.600
S12	0.022	5.00	141.500	1200	2.900
S13	0.026	5.00	140.633	1200	3.233
S14	0.140	5.00	147.700	1200	2.200
S15			147.300	1200	2.600
S16			144.000	1200	0.825
S17			142.200	1200	2.325
S18			136.500	1200	1.000
S19	0.150	5.00	144.550	1200	2.550
S20			138.600	1800	2.900
S21	0.065	5.00	137.000	1800	2.280
S22	0.110	5.00	136.900	1200	2.110
S23			135.770	1200	1.170
S24			136.000	1800	1.875
S25	0.065	5.00	134.800	1800	3.800
S26	0.120	5.00	135.000	1200	2.000
S27			132.200	1200	1.200
S28	0.100	5.00	131.930	1200	3.560
S29			131.989	1200	3.689
S30	0.135	5.00	132.600	1800	4.740
S31			130.700	1800	3.430
S32			130.400	1800	3.140
S33			129.000	1200	2.010

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	S1	S2	33.000	0.600	138.000	137.000	1.000	33.0	300	5.20	47.4
1.002	S2	S3	21.000	0.600	137.000	136.790	0.210	100.0	300	5.42	46.6
1.003	S3	S4	23.000	0.600	136.790	136.560	0.230	100.0	300	5.67	45.7
1.004	S4	S5	26.000	0.600	136.560	136.300	0.260	100.0	300	5.94	44.8
1.005	S5	S6	19.000	0.600	136.300	136.110	0.190	100.0	300	6.14	44.1
1.006	S6	S20	19.000	0.600	135.810	135.700	0.110	172.7	600	6.32	43.6
1.007	S20	S21	24.000	0.600	135.700	134.720	0.980	24.5	600	6.40	43.3
1.008	S21	S24	18.000	0.600	134.720	134.125	0.595	30.3	600	6.46	43.1
1.009	S24	S25	21.000	0.600	134.125	131.000	3.125	6.7	600	6.50	43.0
1.010	S25	S30	40.000	0.600	131.000	127.880	3.120	12.8	600	6.60	42.7
1.011	S30	S31	7.000	0.600	127.860	127.840	0.020	350.0	600	6.69	42.4
1.012	S31	S32	1.000	0.600	127.270	127.260	0.010	100.0	600	6.70	42.4
1.013	S32	S33	27.000	0.600	127.260	126.990	0.270	100.0	225	7.04	0.0
2.000	S7	S8	19.000	0.600	146.000	145.000	1.000	19.0	300	5.09	47.9
2.001	S8	S9	19.000	0.600	145.000	144.000	1.000	19.0	300	5.17	47.5
2.002	S9	S11	18.500	0.600	144.000	143.000	1.000	18.5	300	5.26	47.2
2.003	S11	S12	44.000	0.600	143.000	138.600	4.400	10.0	300	5.41	46.7
2.004	S12	S13	12.000	0.600	138.600	137.400	1.200	10.0	300	5.45	46.5
2.005	S13	S6	13.000	0.600	137.400	136.110	1.290	10.1	300	5.49	46.4
3.000	S10	S9	18.000	0.600	146.000	144.000	2.000	9.0	300	5.06	48.0
4.000	S14	S15	25.000	0.600	145.500	144.700	0.800	31.3	225	5.18	47.5

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)
1.000	2.746	194.1	5.7	0.900	0.950	0.044	0.0	35	1.236
1.002	1.572	111.1	11.9	0.950	1.710	0.094	0.0	66	1.036
1.003	1.572	111.1	26.5	1.710	2.640	0.214	0.0	99	1.297
1.004	1.572	111.1	38.1	2.640	3.715	0.314	0.0	121	1.430
1.005	1.572	111.1	41.9	3.715	3.390	0.350	0.0	127	1.465
1.006	1.850	523.0	98.0	3.390	2.300	0.830	0.0	175	1.434
1.007	4.934	1394.9	97.5	2.300	1.680	0.830	0.0	106	2.900
1.008	4.438	1254.7	104.6	1.680	1.275	0.895	0.0	116	2.746
1.009	9.430	2666.4	150.9	1.275	3.200	1.295	0.0	95	5.219
1.010	6.824	1929.4	157.4	3.200	4.120	1.360	0.0	115	4.201
1.011	1.296	366.3	197.3	4.140	2.260	1.715	0.0	314	1.319
1.012	2.435	688.5	197.2	2.830	2.540	1.715	0.0	219	2.116
1.013	1.307	52.0	0.0	2.915	1.785	1.715	0.0	0	0.000
2.000	3.623	256.1	5.2	1.620	1.600	0.040	0.0	29	1.454
2.001	3.623	256.1	11.6	1.600	1.600	0.090	0.0	43	1.861
2.002	3.672	259.5	32.0	1.600	1.300	0.250	0.0	71	2.522
2.003	4.999	353.4	51.9	1.300	2.600	0.410	0.0	77	3.606
2.004	4.999	353.4	54.5	2.600	2.933	0.432	0.0	79	3.651
2.005	4.980	352.0	57.6	2.933	3.390	0.458	0.0	82	3.710
3.000	5.270	372.5	13.0	0.400	1.600	0.100	0.0	38	2.501
4.000	2.348	93.4	18.0	1.975	2.375	0.140	0.0	66	1.820

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)
4.001	S15	S16	24.000	0.600	144.700	143.175	1.525	15.7	225	5.30	47.1
4.002	S16	S17	33.000	0.600	143.175	139.875	3.300	10.0	225	5.43	46.6
4.003	S17	S18	46.000	0.600	139.875	135.500	4.375	10.5	225	5.62	45.9
4.004	S18	S24	22.000	0.600	135.500	134.500	1.000	22.0	225	5.75	45.4
5.000	S19	S17	30.000	0.600	142.000	139.875	2.125	14.1	225	5.14	47.7
6.000	S22	S23	19.000	0.600	134.790	134.600	0.190	100.0	300	5.20	47.4
6.001	S23	S24	10.000	0.600	134.600	134.125	0.475	21.1	300	5.25	47.3
7.000	S26	S27	34.000	0.600	133.000	131.000	2.000	17.0	300	5.15	47.6
7.001	S27	S28	25.000	0.600	131.000	128.370	2.630	9.5	300	5.23	47.3
7.002	S28	S29	7.000	0.600	128.370	128.300	0.070	100.0	300	5.30	47.1
7.003	S29	S30	13.000	0.600	128.300	128.150	0.150	86.7	300	5.43	46.6

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)
4.001	3.315	131.8	17.9	2.375	0.600	0.140	0.0	56	2.337
4.002	4.161	165.5	17.7	0.600	2.100	0.140	0.0	50	2.747
4.003	4.058	161.4	36.1	2.100	0.775	0.290	0.0	72	3.278
4.004	2.801	111.4	35.7	0.775	1.275	0.290	0.0	87	2.502
5.000	3.500	139.2	19.4	2.325	2.100	0.150	0.0	57	2.490
6.000	1.572	111.1	14.1	1.810	0.870	0.110	0.0	72	1.088
6.001	3.441	243.2	14.1	0.870	1.575	0.110	0.0	48	1.895
7.000	3.831	270.8	15.5	1.700	0.900	0.120	0.0	48	2.111
7.001	5.128	362.4	15.4	0.900	3.260	0.120	0.0	42	2.593
7.002	1.572	111.1	28.1	3.260	3.389	0.220	0.0	102	1.316
7.003	1.689	119.4	27.8	3.389	4.150	0.220	0.0	98	1.385

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	33.000	33.0	300	Circular	139.200	138.000	0.900	138.250	137.000	0.950
1.002	21.000	100.0	300	Circular	138.250	137.000	0.950	138.800	136.790	1.710
1.003	23.000	100.0	300	Circular	138.800	136.790	1.710	139.500	136.560	2.640
1.004	26.000	100.0	300	Circular	139.500	136.560	2.640	140.315	136.300	3.715
1.005	19.000	100.0	300	Circular	140.315	136.300	3.715	139.800	136.110	3.390
1.006	19.000	172.7	600	Circular	139.800	135.810	3.390	138.600	135.700	2.300

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	1200	Manhole	Adoptable	S2	120	Manhole	Adoptable
1.002	S2	120	Manhole	Adoptable	S3	1200	Manhole	Adoptable
1.003	S3	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
1.004	S4	1200	Manhole	Adoptable	S5	1200	Manhole	Adoptable
1.005	S5	1200	Manhole	Adoptable	S6	1800	Manhole	Adoptable
1.006	S6	1800	Manhole	Adoptable	S20	1800	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.007	24.000	24.5	600	Circular	138.600	135.700	2.300	137.000	134.720	1.680
1.008	18.000	30.3	600	Circular	137.000	134.720	1.680	136.000	134.125	1.275
1.009	21.000	6.7	600	Circular	136.000	134.125	1.275	134.800	131.000	3.200
1.010	40.000	12.8	600	Circular	134.800	131.000	3.200	132.600	127.880	4.120
1.011	7.000	350.0	600	Circular	132.600	127.860	4.140	130.700	127.840	2.260
1.012	1.000	100.0	600	Circular	130.700	127.270	2.830	130.400	127.260	2.540
1.013	27.000	100.0	225	Circular	130.400	127.260	2.915	129.000	126.990	1.785
2.000	19.000	19.0	300	Circular	147.920	146.000	1.620	146.900	145.000	1.600
2.001	19.000	19.0	300	Circular	146.900	145.000	1.600	145.900	144.000	1.600
2.002	18.500	18.5	300	Circular	145.900	144.000	1.600	144.600	143.000	1.300
2.003	44.000	10.0	300	Circular	144.600	143.000	1.300	141.500	138.600	2.600
2.004	12.000	10.0	300	Circular	141.500	138.600	2.600	140.633	137.400	2.933
2.005	13.000	10.1	300	Circular	140.633	137.400	2.933	139.800	136.110	3.390
3.000	18.000	9.0	300	Circular	146.700	146.000	0.400	145.900	144.000	1.600
4.000	25.000	31.3	225	Circular	147.700	145.500	1.975	147.300	144.700	2.375
4.001	24.000	15.7	225	Circular	147.300	144.700	2.375	144.000	143.175	0.600
4.002	33.000	10.0	225	Circular	144.000	143.175	0.600	142.200	139.875	2.100
4.003	46.000	10.5	225	Circular	142.200	139.875	2.100	136.500	135.500	0.775
4.004	22.000	22.0	225	Circular	136.500	135.500	0.775	136.000	134.500	1.275
5.000	30.000	14.1	225	Circular	144.550	142.000	2.325	142.200	139.875	2.100

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.007	S20	1800	Manhole	Adoptable	S21	1800	Manhole	Adoptable
1.008	S21	1800	Manhole	Adoptable	S24	1800	Manhole	Adoptable
1.009	S24	1800	Manhole	Adoptable	S25	1800	Manhole	Adoptable
1.010	S25	1800	Manhole	Adoptable	S30	1800	Manhole	Adoptable
1.011	S30	1800	Manhole	Adoptable	S31	1800	Manhole	Adoptable
1.012	S31	1800	Manhole	Adoptable	S32	1800	Manhole	Adoptable
1.013	S32	1800	Manhole	Adoptable	S33	1200	Manhole	Adoptable
2.000	S7	1200	Manhole	Adoptable	S8	1200	Manhole	Adoptable
2.001	S8	1200	Manhole	Adoptable	S9	1200	Manhole	Adoptable
2.002	S9	1200	Manhole	Adoptable	S11	1200	Manhole	Adoptable
2.003	S11	1200	Manhole	Adoptable	S12	1200	Manhole	Adoptable
2.004	S12	1200	Manhole	Adoptable	S13	1200	Manhole	Adoptable
2.005	S13	1200	Manhole	Adoptable	S6	1800	Manhole	Adoptable
3.000	S10	1200	Manhole	Adoptable	S9	1200	Manhole	Adoptable
4.000	S14	1200	Manhole	Adoptable	S15	1200	Manhole	Adoptable
4.001	S15	1200	Manhole	Adoptable	S16	1200	Manhole	Adoptable
4.002	S16	1200	Manhole	Adoptable	S17	1200	Manhole	Adoptable
4.003	S17	1200	Manhole	Adoptable	S18	1200	Manhole	Adoptable
4.004	S18	1200	Manhole	Adoptable	S24	1800	Manhole	Adoptable
5.000	S19	1200	Manhole	Adoptable	S17	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
6.000	19.000	100.0	300	Circular	136.900	134.790	1.810	135.770	134.600	0.870
6.001	10.000	21.1	300	Circular	135.770	134.600	0.870	136.000	134.125	1.575
7.000	34.000	17.0	300	Circular	135.000	133.000	1.700	132.200	131.000	0.900
7.001	25.000	9.5	300	Circular	132.200	131.000	0.900	131.930	128.370	3.260
7.002	7.000	100.0	300	Circular	131.930	128.370	3.260	131.989	128.300	3.389
7.003	13.000	86.7	300	Circular	131.989	128.300	3.389	132.600	128.150	4.150

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
6.000	S22	1200	Manhole	Adoptable	S23	1200	Manhole	Adoptable
6.001	S23	1200	Manhole	Adoptable	S24	1800	Manhole	Adoptable
7.000	S26	1200	Manhole	Adoptable	S27	1200	Manhole	Adoptable
7.001	S27	1200	Manhole	Adoptable	S28	1200	Manhole	Adoptable
7.002	S28	1200	Manhole	Adoptable	S29	1200	Manhole	Adoptable
7.003	S29	1200	Manhole	Adoptable	S30	1800	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	139.200	1.200	1200				
				0	1.000	138.000	300
S2	138.250	1.250	120				
				0	1.002	137.000	300
S3	138.800	2.010	1200				
				0	1.003	136.790	300
S4	139.500	2.940	1200				
				0	1.004	136.560	300
S5	140.315	4.015	1200				
				0	1.004	136.300	300
S6	139.800	3.990	1800				
				0	1.005	136.110	300
				2	1.005	136.110	300
				0	1.006	135.810	600
S7	147.920	1.920	1200				
				0	2.000	146.000	300

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S8	146.900	1.900	1200	1	2.000	145.000	300
							
				0	2.001	145.000	300
S9	145.900	1.900	1200	1	3.000	144.000	300
							
				2	2.001	144.000	300
				0	2.002	144.000	300
S10	146.700	0.700	1200				
							
				0	3.000	146.000	300
S11	144.600	1.600	1200	1	2.002	143.000	300
							
				0	2.003	143.000	300
S12	141.500	2.900	1200	1	2.003	138.600	300
							
				0	2.004	138.600	300
S13	140.633	3.233	1200	1	2.004	137.400	300
							
				0	2.005	137.400	300
S14	147.700	2.200	1200				
							
				0	4.000	145.500	225
S15	147.300	2.600	1200	1	4.000	144.700	225
							
				0	4.001	144.700	225
S16	144.000	0.825	1200	1	4.001	143.175	225
							
				0	4.002	143.175	225
S17	142.200	2.325	1200	1	5.000	139.875	225
							
				2	4.002	139.875	225
				0	4.003	139.875	225
S18	136.500	1.000	1200	1	4.003	135.500	225
							
				0	4.004	135.500	225
S19	144.550	2.550	1200				
							
				0	5.000	142.000	225
S20	138.600	2.900	1800	1	1.006	135.700	600
							
				0	1.007	135.700	600

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S21	137.000	2.280	1800		1	1.007	134.720	600
					0	1.008	134.720	600
S22	136.900	2.110	1200		0	6.000	134.790	300
					1	6.000	134.600	300
S23	135.770	1.170	1200		0	6.001	134.600	300
					1	6.001	134.125	300
					2	4.004	134.500	225
					3	1.008	134.125	600
S24	136.000	1.875	1800		0	1.009	134.125	600
					1	1.009	131.000	600
S25	134.800	3.800	1800		0	1.010	131.000	600
					0	7.000	133.000	300
S26	135.000	2.000	1200		1	7.000	131.000	300
					0	7.001	131.000	300
S27	132.200	1.200	1200		1	7.001	128.370	300
					0	7.002	128.370	300
S28	131.930	3.560	1200		1	7.002	128.300	300
					0	7.003	128.300	300
S29	131.989	3.689	1200		1	7.003	128.150	300
					2	1.010	127.880	600
					0	1.011	127.860	600
S30	132.600	4.740	1800		1	1.011	127.840	600
					0	1.012	127.270	600
S31	130.700	3.430	1800		1	1.012	127.260	600
					0	1.013	127.260	225
S32	130.400	3.140	1800		1	1.013	126.990	225
					1	1.013	126.990	225
S33	129.000	2.010	1200		0	1.013	126.990	225
					1	1.013	126.990	225

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	19.000	Drain Down Time (mins)	240
Ratio-R	0.344	Additional Storage (m ³ /ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	40	0	0

Node S32 Online Hydro-Brake® Control

Flap Valve	x	Objective (HE)	Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	127.260	Product Number	CTL-SHE-0170-1610-1700-1610
Design Depth (m)	1.700	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	16.1	Min Node Diameter (mm)	1500

Node S31 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	127.270
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	880.0	0.0	1.200	880.0	0.0	1.201	0.0	0.0

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m ³)	
Full Bore Velocity	✓		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	S1	10	138.035	0.035	5.6	0.0646	0.0000	OK
15 minute winter	S2	10	137.065	0.065	11.9	0.0527	0.0000	OK
15 minute winter	S3	10	136.893	0.103	26.9	0.2389	0.0000	OK
15 minute winter	S4	11	136.687	0.127	39.0	0.2305	0.0000	OK
15 minute winter	S5	11	136.440	0.140	43.2	0.1827	0.0000	OK
15 minute winter	S6	11	135.999	0.189	102.7	0.5024	0.0000	OK
15 minute winter	S7	10	146.029	0.029	5.1	0.0451	0.0000	OK
15 minute winter	S8	10	145.043	0.043	11.5	0.0709	0.0000	OK
15 minute winter	S9	10	144.072	0.072	31.5	0.1267	0.0000	OK
15 minute winter	S10	10	146.038	0.038	12.7	0.1500	0.0000	OK
15 minute winter	S11	10	143.077	0.077	51.5	0.2413	0.0000	OK
15 minute winter	S12	10	138.683	0.083	53.9	0.1069	0.0000	OK
15 minute winter	S13	10	137.488	0.087	56.8	0.1130	0.0000	OK
15 minute winter	S14	10	145.570	0.070	17.8	0.1679	0.0000	OK
15 minute winter	S15	10	144.758	0.058	17.6	0.0657	0.0000	OK
15 minute winter	S16	10	143.224	0.049	17.5	0.0554	0.0000	OK
15 minute winter	S17	11	139.947	0.072	36.3	0.0811	0.0000	OK
15 minute winter	S18	11	135.592	0.092	35.8	0.1044	0.0000	OK
15 minute winter	S19	10	142.056	0.056	19.1	0.1290	0.0000	OK
15 minute winter	S20	11	135.811	0.111	103.2	0.2833	0.0000	OK
15 minute winter	S21	11	134.853	0.133	111.3	0.4152	0.0000	OK
15 minute winter	S22	10	134.867	0.077	14.0	0.1678	0.0000	OK
15 minute winter	S23	10	134.648	0.048	13.8	0.0544	0.0000	OK
15 minute winter	S24	11	134.226	0.101	161.0	0.2570	0.0000	OK
15 minute winter	S25	11	131.118	0.118	168.9	0.3397	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	S1	1.000	S2	5.5	0.721	0.028	0.2593	
15 minute winter	S2	1.002	S3	11.6	0.725	0.105	0.3415	
15 minute winter	S3	1.003	S4	26.4	1.068	0.238	0.5716	
15 minute winter	S4	1.004	S5	38.9	1.287	0.350	0.7868	
15 minute winter	S5	1.005	S6	43.5	1.427	0.392	0.5798	
15 minute winter	S6	1.006	S20	103.2	1.871	0.197	1.0644	
15 minute winter	S7	2.000	S8	5.1	1.062	0.020	0.0915	
15 minute winter	S8	2.001	S9	11.3	1.210	0.044	0.1811	
15 minute winter	S9	2.002	S11	31.2	2.295	0.120	0.2517	
15 minute winter	S10	3.000	S9	12.6	1.438	0.034	0.1621	
15 minute winter	S11	2.003	S12	51.1	3.384	0.145	0.6647	
15 minute winter	S12	2.004	S13	53.5	3.244	0.151	0.1980	
15 minute winter	S13	2.005	S6	56.5	3.506	0.161	0.2098	
15 minute winter	S14	4.000	S15	17.6	1.901	0.189	0.2322	
15 minute winter	S15	4.001	S16	17.5	2.420	0.132	0.1735	
15 minute winter	S16	4.002	S17	17.3	2.026	0.105	0.2843	
15 minute winter	S17	4.003	S18	35.8	2.771	0.222	0.6024	
15 minute winter	S18	4.004	S24	36.1	2.440	0.324	0.3259	
15 minute winter	S19	5.000	S17	19.0	2.052	0.136	0.2781	
15 minute winter	S20	1.007	S21	103.5	2.516	0.074	0.9891	
15 minute winter	S21	1.008	S24	111.4	2.883	0.089	0.6993	
15 minute winter	S22	6.000	S23	13.8	1.299	0.124	0.2051	
15 minute winter	S23	6.001	S24	13.7	1.045	0.056	0.1400	
15 minute winter	S24	1.009	S25	161.1	4.604	0.060	0.7362	
15 minute winter	S25	1.010	S30	168.8	1.764	0.088	3.9521	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	S26	10	133.050	0.050	15.3	0.1171	0.0000	OK
15 minute winter	S27	10	131.041	0.041	15.1	0.0468	0.0000	OK
15 minute winter	S28	10	128.484	0.114	27.7	0.1932	0.0000	OK
15 minute winter	S29	11	128.405	0.105	27.3	0.1184	0.0000	OK
15 minute winter	S30	11	128.210	0.350	212.4	1.0896	0.0000	OK
360 minute winter	S31	256	127.479	0.209	37.5	184.3002	0.0000	OK
360 minute winter	S32	256	127.478	0.218	14.4	0.5555	0.0000	OK
15 minute summer	S33	1	126.990	0.000	6.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	S26	7.000	S27	15.1	2.237	0.056	0.2311	
15 minute winter	S27	7.001	S28	15.0	1.037	0.041	0.3805	
15 minute winter	S28	7.002	S29	27.3	1.177	0.245	0.1622	
15 minute winter	S29	7.003	S30	27.4	1.319	0.229	0.2697	
15 minute winter	S30	1.011	S31	211.2	1.362	0.577	1.0852	
360 minute winter	S31	1.012	S32	14.4	0.216	0.021	0.0899	
360 minute winter	S32	Hydro-Brake®	S33	14.4				270.9

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	S1	10	138.053	0.053	13.7	0.0995	0.0000	OK
15 minute winter	S2	10	137.103	0.103	29.1	0.0835	0.0000	OK
15 minute winter	S3	10	136.970	0.180	66.0	0.4192	0.0000	OK
15 minute winter	S4	11	136.800	0.240	96.2	0.4344	0.0000	OK
15 minute winter	S5	11	136.568	0.268	105.8	0.3512	0.0000	OK
15 minute winter	S6	11	136.115	0.305	250.6	0.8091	0.0000	OK
15 minute winter	S7	10	146.045	0.045	12.5	0.0692	0.0000	OK
15 minute winter	S8	10	145.066	0.066	28.0	0.1099	0.0000	OK
15 minute winter	S9	10	144.118	0.118	77.4	0.2080	0.0000	OK
15 minute winter	S10	10	146.058	0.058	31.1	0.2315	0.0000	OK
15 minute winter	S11	10	143.124	0.124	126.5	0.3888	0.0000	OK
15 minute winter	S12	10	138.741	0.140	132.6	0.1802	0.0000	OK
15 minute winter	S13	10	137.550	0.150	139.8	0.1933	0.0000	OK
15 minute winter	S14	10	145.616	0.116	43.6	0.2787	0.0000	OK
15 minute winter	S15	10	144.795	0.095	43.2	0.1071	0.0000	OK
15 minute winter	S16	10	143.253	0.078	42.9	0.0877	0.0000	OK
15 minute winter	S17	10	139.993	0.118	89.0	0.1333	0.0000	OK
15 minute winter	S18	11	135.666	0.166	88.1	0.1881	0.0000	OK
15 minute winter	S19	10	142.089	0.089	46.7	0.2055	0.0000	OK
15 minute winter	S20	11	135.881	0.181	251.6	0.4594	0.0000	OK
15 minute winter	S21	11	134.940	0.220	271.8	0.6841	0.0000	OK
15 minute winter	S22	10	134.914	0.124	34.3	0.2701	0.0000	OK
15 minute winter	S23	10	134.675	0.075	33.9	0.0848	0.0000	OK
15 minute winter	S24	11	134.289	0.164	394.1	0.4181	0.0000	OK
15 minute winter	S25	11	131.185	0.185	414.0	0.5338	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	S1	1.000	S2	13.6	0.930	0.070	0.4920	
15 minute winter	S2	1.002	S3	28.7	0.878	0.258	0.6887	
15 minute winter	S3	1.003	S4	65.1	1.235	0.586	1.2025	
15 minute winter	S4	1.004	S5	95.2	1.507	0.856	1.6487	
15 minute winter	S5	1.005	S6	106.5	1.703	0.958	1.1842	
15 minute winter	S6	1.006	S20	251.6	2.358	0.481	2.0422	
15 minute winter	S7	2.000	S8	12.4	1.387	0.048	0.1718	
15 minute winter	S8	2.001	S9	27.8	1.516	0.109	0.3539	
15 minute winter	S9	2.002	S11	76.8	2.884	0.296	0.4925	
15 minute winter	S10	3.000	S9	30.9	1.797	0.083	0.3173	
15 minute winter	S11	2.003	S12	125.7	4.199	0.356	1.3177	
15 minute winter	S12	2.004	S13	131.7	3.906	0.373	0.4048	
15 minute winter	S13	2.005	S6	139.2	4.330	0.395	0.4180	
15 minute winter	S14	4.000	S15	43.2	2.373	0.463	0.4557	
15 minute winter	S15	4.001	S16	42.9	3.071	0.325	0.3354	
15 minute winter	S16	4.002	S17	42.6	2.579	0.257	0.5467	
15 minute winter	S17	4.003	S18	88.1	3.365	0.546	1.2037	
15 minute winter	S18	4.004	S24	88.3	2.962	0.793	0.6555	
15 minute winter	S19	5.000	S17	46.4	2.608	0.334	0.5347	
15 minute winter	S20	1.007	S21	252.7	3.075	0.181	1.9756	
15 minute winter	S21	1.008	S24	273.0	3.518	0.218	1.4026	
15 minute winter	S22	6.000	S23	33.9	1.662	0.306	0.3923	
15 minute winter	S23	6.001	S24	33.8	1.319	0.139	0.2646	
15 minute winter	S24	1.009	S25	394.9	5.805	0.148	1.4297	
15 minute winter	S25	1.010	S30	414.5	2.121	0.215	7.1030	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	S26	10	133.079	0.079	37.4	0.1845	0.0000	OK
15 minute winter	S27	10	131.064	0.064	37.1	0.0726	0.0000	OK
15 minute winter	S28	11	128.586	0.216	67.9	0.3662	0.0000	OK
15 minute winter	S29	11	128.523	0.223	66.2	0.2523	0.0000	OK
15 minute winter	S30	11	128.481	0.620	518.8	1.9321	0.0000	SURCHARGED
240 minute winter	S31	232	127.812	0.542	110.2	478.0491	0.0000	OK
240 minute winter	S32	232	127.812	0.552	16.2	1.4038	0.0000	SURCHARGED
15 minute summer	S33	1	126.990	0.000	14.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	S26	7.000	S27	37.1	2.883	0.137	0.4391	
15 minute winter	S27	7.001	S28	36.9	1.196	0.102	0.8144	
15 minute winter	S28	7.002	S29	66.2	1.333	0.596	0.3870	
15 minute winter	S29	7.003	S30	64.7	1.375	0.542	0.8230	
15 minute winter	S30	1.011	S31	519.0	1.928	1.417	1.8176	
240 minute winter	S31	1.012	S32	16.2	0.273	0.024	0.2694	
240 minute winter	S32	Hydro-Brake®	S33	16.1				380.8

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	S1	10	138.072	0.072	24.8	0.1335	0.0000	OK
15 minute winter	S2	12	137.905	0.905	52.8	0.7339	0.0000	SURCHARGED
15 minute winter	S3	12	137.852	1.062	105.3	2.4692	0.0000	SURCHARGED
15 minute winter	S4	11	137.590	1.030	152.8	1.8647	0.0000	SURCHARGED
15 minute winter	S5	11	136.978	0.678	168.6	0.8885	0.0000	SURCHARGED
15 minute winter	S6	11	136.229	0.419	428.4	1.1111	0.0000	OK
15 minute winter	S7	10	146.060	0.060	22.5	0.0922	0.0000	OK
15 minute winter	S8	10	145.090	0.089	50.6	0.1483	0.0000	OK
15 minute winter	S9	10	144.171	0.171	140.2	0.3017	0.0000	OK
15 minute winter	S10	10	146.078	0.078	56.4	0.3116	0.0000	OK
15 minute winter	S11	10	143.177	0.177	229.2	0.5539	0.0000	OK
15 minute winter	S12	10	138.814	0.214	240.3	0.2740	0.0000	OK
15 minute winter	S13	10	137.633	0.233	253.3	0.3014	0.0000	OK
15 minute winter	S14	10	145.677	0.177	78.9	0.4251	0.0000	OK
15 minute winter	S15	10	144.837	0.137	78.1	0.1548	0.0000	OK
15 minute winter	S16	10	143.282	0.107	77.5	0.1214	0.0000	OK
15 minute winter	S17	12	140.459	0.584	161.2	0.6600	0.0000	SURCHARGED
15 minute winter	S18	10	136.500	1.000	142.7	1.1310	1.3093	FLOOD
15 minute winter	S19	10	142.125	0.125	84.5	0.2894	0.0000	OK
15 minute winter	S20	11	135.948	0.248	429.2	0.6308	0.0000	OK
15 minute winter	S21	11	135.025	0.305	464.9	0.9513	0.0000	OK
15 minute winter	S22	10	134.965	0.175	62.0	0.3798	0.0000	OK
15 minute winter	S23	10	134.707	0.107	61.5	0.1208	0.0000	OK
15 minute winter	S24	11	134.348	0.223	660.9	0.5664	0.0000	OK
15 minute winter	S25	11	131.244	0.243	696.0	0.7029	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	S1	1.000	S2	24.6	1.031	0.127	1.3743	
15 minute winter	S2	1.002	S3	49.0	0.914	0.441	1.4788	
15 minute winter	S3	1.003	S4	104.0	1.477	0.936	1.6196	
15 minute winter	S4	1.004	S5	150.8	2.142	1.357	1.8309	
15 minute winter	S5	1.005	S6	167.7	2.382	1.509	1.3244	
15 minute winter	S6	1.006	S20	429.2	2.672	0.821	3.0374	
15 minute winter	S7	2.000	S8	22.4	1.644	0.087	0.2613	
15 minute winter	S8	2.001	S9	50.3	1.714	0.196	0.5617	
15 minute winter	S9	2.002	S11	139.1	3.283	0.536	0.7839	
15 minute winter	S10	3.000	S9	56.2	2.030	0.151	0.5047	
15 minute winter	S11	2.003	S12	227.9	4.695	0.645	2.1311	
15 minute winter	S12	2.004	S13	238.6	4.241	0.675	0.6746	
15 minute winter	S13	2.005	S6	251.9	4.808	0.716	0.6796	
15 minute winter	S14	4.000	S15	78.1	2.644	0.837	0.7344	
15 minute winter	S15	4.001	S16	77.5	3.525	0.588	0.5274	
15 minute winter	S16	4.002	S17	77.1	2.853	0.466	0.9613	
15 minute winter	S17	4.003	S18	142.7	3.717	0.885	1.8295	
15 minute winter	S18	4.004	S24	135.2	3.401	1.214	0.8746	
15 minute winter	S19	5.000	S17	84.1	2.968	0.604	0.9312	
15 minute winter	S20	1.007	S21	430.4	3.392	0.309	3.0471	
15 minute winter	S21	1.008	S24	466.4	3.908	0.372	2.1521	
15 minute winter	S22	6.000	S23	61.5	1.895	0.553	0.6178	
15 minute winter	S23	6.001	S24	61.1	1.572	0.251	0.3886	
15 minute winter	S24	1.009	S25	661.5	6.543	0.248	2.1238	
15 minute winter	S25	1.010	S30	696.2	3.059	0.361	7.7784	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	S26	10	133.109	0.109	67.6	0.2536	0.0000	OK
15 minute winter	S27	10	131.087	0.087	67.2	0.0979	0.0000	OK
15 minute winter	S28	11	129.174	0.804	123.2	1.3615	0.0000	SURCHARGED
15 minute winter	S29	11	129.019	0.719	118.6	0.8133	0.0000	SURCHARGED
15 minute winter	S30	11	128.792	0.932	886.6	2.9020	0.0000	SURCHARGED
480 minute winter	S31	464	128.443	1.173	119.8	1034.7930	0.0000	SURCHARGED
480 minute winter	S32	464	128.442	1.182	16.4	3.0093	0.0000	SURCHARGED
15 minute summer	S33	1	126.990	0.000	16.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	S26	7.000	S27	67.2	3.380	0.248	0.6775	
15 minute winter	S27	7.001	S28	66.8	1.280	0.184	1.0904	
15 minute winter	S28	7.002	S29	118.6	1.685	1.068	0.4929	
15 minute winter	S29	7.003	S30	118.8	1.687	0.995	0.9155	
15 minute winter	S30	1.011	S31	886.8	3.149	2.421	1.9504	
480 minute winter	S31	1.012	S32	16.4	0.258	0.024	0.2817	
480 minute winter	S32	Hydro-Brake®	S33	16.1				517.5