

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	200.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	1.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

D AND CG Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
299	1200	899	1800	1801	3000
449	1350	1199	2100		
599	1500	1799	2700		

>1801 Link+900 mm

SW CIRCULAR Link Type

Shape	Circular	Auto Increment (mm)	75
Barrels	1	Follow Ground	x

Available Diameters (mm)

225	375	525	750	900	1200	1500
300	450	600	825	1050	1350	1800

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.051	5.00	43.000	1800	346102.762	392109.425	1.200
2	0.051	5.00	42.966	2700	346098.176	392097.020	2.529
3	0.051	5.00	42.988	2700	346085.434	392078.413	2.608
4	0.051	5.00	42.813	2700	346095.193	392071.028	2.464
5	0.051	5.00	42.708	2700	346101.232	392056.160	2.400
6	0.051	5.00	42.919	2700	346114.230	392045.495	2.654
7	0.051	5.00	43.850	2700	346157.248	392074.082	3.526
8	0.051	5.00	43.640	2700	346147.614	392065.484	3.349
9	0.051	5.00	43.422	2700	346139.928	392050.218	3.174
10	0.051	5.00	43.225	2700	346134.539	392035.405	3.017
11	0.051	5.00	43.163	2700	346129.174	392022.188	2.991
12	0.051	5.00	43.426	2700	346121.565	392001.128	3.311
13	0.051	5.00	43.580	2700	346117.986	391990.663	3.493
14	0.051	5.00	43.721	2700	346111.023	391982.683	3.661
15	0.051	5.00	42.587	2700	346057.347	392004.922	2.443
16	0.051	5.00	42.825	2700	346074.847	391999.883	2.727
17	0.051	5.00	43.100	2700	346084.243	391992.670	3.032
18	0.051	5.00	43.942	2700	346094.580	391973.657	3.929
19	0.051	5.00	44.383	2700	346064.865	391956.081	4.457
20	0.051	5.00	44.523	2700	346053.232	391949.800	4.630
21	0.051	5.00	44.520	2700	346045.238	391949.126	4.647

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
22	0.051	5.00	44.303	2700	346027.025	391954.225	4.478
HB1	0.051	5.00	44.400	2700	346020.388	391934.978	4.627
OF			40.800	1350	345993.110	391935.836	1.146

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	13.226	0.600	41.800	41.337	0.463	28.6	300	5.07	69.8
1.001	2	3	22.552	0.600	40.437	40.380	0.057	395.0	1200	5.28	68.7
1.002	3	4	12.238	0.600	40.380	40.349	0.031	395.0	1200	5.38	68.1
1.003	4	5	16.048	0.600	40.349	40.308	0.041	395.0	1200	5.53	67.3
1.004	5	6	16.813	0.600	40.308	40.265	0.043	395.0	1200	5.68	66.5
1.005	6	10	22.677	0.600	40.265	40.208	0.057	395.0	1200	5.88	65.5
2.000	7	8	12.913	0.600	40.324	40.291	0.033	395.0	1200	5.11	69.6
2.001	8	9	17.092	0.600	40.291	40.248	0.043	395.0	1200	5.27	68.7
2.002	9	10	15.763	0.600	40.248	40.208	0.040	395.0	1200	5.41	67.9
1.006	10	11	14.264	0.600	40.208	40.172	0.036	395.0	1200	6.00	64.8
1.008	11	12	22.392	0.600	40.172	40.115	0.057	395.0	1200	6.20	63.9
1.009	12	13	11.060	0.600	40.115	40.087	0.028	395.0	1200	6.30	63.4
1.010	13	14	10.591	0.600	40.087	40.060	0.027	395.0	1200	6.40	63.0
1.011	14	18	18.757	0.600	40.060	40.013	0.047	395.0	1200	6.56	62.2
3.000	15	16	18.211	0.600	40.144	40.098	0.046	395.0	1200	5.16	69.3
3.001	16	17	11.845	0.600	40.098	40.068	0.030	395.0	1200	5.27	68.7
3.002	17	18	21.641	0.600	40.068	40.013	0.055	395.0	1200	5.46	67.6
1.012	18	19	34.524	0.600	40.013	39.926	0.087	395.0	1200	6.87	60.9
1.013	19	20	13.220	0.600	39.926	39.893	0.033	395.0	1200	6.99	60.4
1.014	20	21	8.022	0.600	39.893	39.873	0.020	395.0	1200	7.06	60.1

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	2.952	208.7	9.7	0.900	1.329	0.051	0.0	44	1.528
1.001	1.876	2121.6	19.0	1.329	1.408	0.102	0.0	78	0.608
1.002	1.876	2121.6	28.2	1.408	1.264	0.153	0.0	94	0.682
1.003	1.876	2121.6	37.2	1.264	1.200	0.204	0.0	108	0.741
1.004	1.876	2121.6	46.0	1.200	1.454	0.255	0.0	119	0.790
1.005	1.876	2121.6	54.3	1.454	1.817	0.306	0.0	129	0.829
2.000	1.876	2121.6	9.6	2.326	2.149	0.051	0.0	57	0.494
2.001	1.876	2121.6	19.0	2.149	1.974	0.102	0.0	78	0.608
2.002	1.876	2121.6	28.2	1.974	1.817	0.153	0.0	94	0.682
1.006	1.876	2121.6	89.6	1.817	1.791	0.510	0.0	164	0.958
1.008	1.876	2121.6	97.1	1.791	2.111	0.561	0.0	171	0.982
1.009	1.876	2121.6	105.2	2.111	2.293	0.612	0.0	178	1.003
1.010	1.876	2121.6	113.1	2.293	2.461	0.663	0.0	185	1.026
1.011	1.876	2121.6	120.4	2.461	2.729	0.714	0.0	190	1.043
3.000	1.876	2121.6	9.6	1.243	1.527	0.051	0.0	57	0.494
3.001	1.876	2121.6	19.0	1.527	1.832	0.102	0.0	78	0.608
3.002	1.876	2121.6	28.1	1.832	2.729	0.153	0.0	94	0.682
1.012	1.876	2121.6	151.4	2.729	3.257	0.918	0.0	213	1.114
1.013	1.876	2121.6	158.6	3.257	3.430	0.969	0.0	218	1.129
1.014	1.876	2121.6	166.1	3.430	3.447	1.020	0.0	224	1.145

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)
1.015	21	22	18.913	0.600	39.873	39.825	0.048	395.0	1200	7.23	59.4
1.016	22	HB1	20.359	0.600	39.825	39.773	0.052	395.0	1200	7.41	58.7
1.017	HB1	OF	27.291	0.600	39.773	39.654	0.119	230.0	300	7.85	57.0

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)
1.015	1.876	2121.6	172.4	3.447	3.278	1.071	0.0	228	1.157
1.016	1.876	2121.6	178.4	3.278	3.427	1.122	0.0	231	1.167
1.017	1.032	73.0	181.2	4.327	0.846	1.173	0.0	300	1.046

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	13.226	28.6	300	SW CIRCULAR	43.000	41.800	0.900	42.966	41.337	1.329
1.001	22.552	395.0	1200	SW CIRCULAR	42.966	40.437	1.329	42.988	40.380	1.408
1.002	12.238	395.0	1200	SW CIRCULAR	42.988	40.380	1.408	42.813	40.349	1.264
1.003	16.048	395.0	1200	SW CIRCULAR	42.813	40.349	1.264	42.708	40.308	1.200
1.004	16.813	395.0	1200	SW CIRCULAR	42.708	40.308	1.200	42.919	40.265	1.454
1.005	22.677	395.0	1200	SW CIRCULAR	42.919	40.265	1.454	43.225	40.208	1.817
2.000	12.913	395.0	1200	SW CIRCULAR	43.850	40.324	2.326	43.640	40.291	2.149
2.001	17.092	395.0	1200	SW CIRCULAR	43.640	40.291	2.149	43.422	40.248	1.974
2.002	15.763	395.0	1200	SW CIRCULAR	43.422	40.248	1.974	43.225	40.208	1.817
1.006	14.264	395.0	1200	SW CIRCULAR	43.225	40.208	1.817	43.163	40.172	1.791
1.008	22.392	395.0	1200	SW CIRCULAR	43.163	40.172	1.791	43.426	40.115	2.111
1.009	11.060	395.0	1200	SW CIRCULAR	43.426	40.115	2.111	43.580	40.087	2.293
1.010	10.591	395.0	1200	SW CIRCULAR	43.580	40.087	2.293	43.721	40.060	2.461
1.011	18.757	395.0	1200	SW CIRCULAR	43.721	40.060	2.461	43.942	40.013	2.729
3.000	18.211	395.0	1200	SW CIRCULAR	42.587	40.144	1.243	42.825	40.098	1.527
3.001	11.845	395.0	1200	SW CIRCULAR	42.825	40.098	1.527	43.100	40.068	1.832
3.002	21.641	395.0	1200	SW CIRCULAR	43.100	40.068	1.832	43.942	40.013	2.729

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1800	Manhole	D AND CG	2	2700	Manhole	D AND CG
1.001	2	2700	Manhole	D AND CG	3	2700	Manhole	D AND CG
1.002	3	2700	Manhole	D AND CG	4	2700	Manhole	D AND CG
1.003	4	2700	Manhole	D AND CG	5	2700	Manhole	D AND CG
1.004	5	2700	Manhole	D AND CG	6	2700	Manhole	D AND CG
1.005	6	2700	Manhole	D AND CG	10	2700	Manhole	D AND CG
2.000	7	2700	Manhole	D AND CG	8	2700	Manhole	D AND CG
2.001	8	2700	Manhole	D AND CG	9	2700	Manhole	D AND CG
2.002	9	2700	Manhole	D AND CG	10	2700	Manhole	D AND CG
1.006	10	2700	Manhole	D AND CG	11	2700	Manhole	D AND CG
1.008	11	2700	Manhole	D AND CG	12	2700	Manhole	D AND CG
1.009	12	2700	Manhole	D AND CG	13	2700	Manhole	D AND CG
1.010	13	2700	Manhole	D AND CG	14	2700	Manhole	D AND CG
1.011	14	2700	Manhole	D AND CG	18	2700	Manhole	D AND CG
3.000	15	2700	Manhole	D AND CG	16	2700	Manhole	D AND CG
3.001	16	2700	Manhole	D AND CG	17	2700	Manhole	D AND CG
3.002	17	2700	Manhole	D AND CG	18	2700	Manhole	D AND CG

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)
1.012	34.524	395.0	1200	SW CIRCULAR	43.942	40.013	2.729	44.383	39.926	3.257
1.013	13.220	395.0	1200	SW CIRCULAR	44.383	39.926	3.257	44.523	39.893	3.430
1.014	8.022	395.0	1200	SW CIRCULAR	44.523	39.893	3.430	44.520	39.873	3.447
1.015	18.913	395.0	1200	SW CIRCULAR	44.520	39.873	3.447	44.303	39.825	3.278
1.016	20.359	395.0	1200	SW CIRCULAR	44.303	39.825	3.278	44.400	39.773	3.427
1.017	27.291	230.0	300	SW CIRCULAR	44.400	39.773	4.327	40.800	39.654	0.846

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.012	18	2700	Manhole	D AND CG	19	2700	Manhole	D AND CG
1.013	19	2700	Manhole	D AND CG	20	2700	Manhole	D AND CG
1.014	20	2700	Manhole	D AND CG	21	2700	Manhole	D AND CG
1.015	21	2700	Manhole	D AND CG	22	2700	Manhole	D AND CG
1.016	22	2700	Manhole	D AND CG	HB1	2700	Manhole	D AND CG
1.017	HB1	2700	Manhole	D AND CG	OF	1350	Manhole	D AND CG

Simulation Settings

Rainfall Methodology	FSR	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	20.000	Check Discharge Rate(s)	✓
Ratio-R	0.400	1 year (l/s)	13.4
Summer CV	0.750	30 year (l/s)	26.1
Winter CV	0.840	100 year (l/s)	32.0
Analysis Speed	Detailed	Check Discharge Volume	x
Skip Steady State	✓		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	10	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Node HB1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	39.773	Product Number	CTL-SHE-0169-1340-0800-1340
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	13.4	Min Node Diameter (mm)	1200

Node HB1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	40.400	Product Number	CTL-SHE-0126-9100-1900-9100
Design Depth (m)	1.900	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	9.1	Min Node Diameter (mm)	1500

Node 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	41.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	28.5	0.0	1.200	243.5	0.0

Node 19 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	41.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

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	72.0	0.0	0.800	72.0	0.0	0.801	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	109.521	30.991
1 year 15 minute winter	76.857	30.991
1 year 30 minute summer	71.439	20.215
1 year 30 minute winter	50.133	20.215
1 year 60 minute summer	48.435	12.800
1 year 60 minute winter	32.179	12.800
1 year 120 minute summer	30.053	7.942
1 year 120 minute winter	19.966	7.942
1 year 180 minute summer	23.233	5.979
1 year 180 minute winter	15.102	5.979
1 year 240 minute summer	18.475	4.882
1 year 240 minute winter	12.274	4.882
1 year 360 minute summer	14.169	3.646
1 year 360 minute winter	9.210	3.646
1 year 480 minute summer	11.185	2.956
1 year 480 minute winter	7.431	2.956
1 year 600 minute summer	9.182	2.511
1 year 600 minute winter	6.274	2.511

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 720 minute summer	8.203	2.199
1 year 720 minute winter	5.513	2.199
1 year 960 minute summer	6.768	1.782
1 year 960 minute winter	4.483	1.782
1 year 1440 minute summer	4.949	1.326
1 year 1440 minute winter	3.326	1.326
30 year 15 minute summer	268.706	76.035
30 year 15 minute winter	188.566	76.035
30 year 30 minute summer	174.929	49.499
30 year 30 minute winter	122.757	49.499
30 year 60 minute summer	116.589	30.811
30 year 60 minute winter	77.459	30.811
30 year 120 minute summer	70.438	18.615
30 year 120 minute winter	46.797	18.615
30 year 180 minute summer	53.298	13.715
30 year 180 minute winter	34.645	13.715
30 year 240 minute summer	41.604	10.995
30 year 240 minute winter	27.641	10.995
30 year 360 minute summer	31.221	8.034
30 year 360 minute winter	20.295	8.034
30 year 480 minute summer	24.324	6.428
30 year 480 minute winter	16.160	6.428
30 year 600 minute summer	19.756	5.404
30 year 600 minute winter	13.498	5.404
30 year 720 minute summer	17.490	4.687
30 year 720 minute winter	11.754	4.687
30 year 960 minute summer	14.215	3.743
30 year 960 minute winter	9.416	3.743
30 year 1440 minute summer	10.161	2.723
30 year 1440 minute winter	6.829	2.723
100 year +45% CC +10% A 15 minute summer	505.670	143.087
100 year +45% CC +10% A 15 minute winter	354.856	143.087
100 year +45% CC +10% A 30 minute summer	332.000	93.944
100 year +45% CC +10% A 30 minute winter	232.982	93.944
100 year +45% CC +10% A 60 minute summer	222.268	58.739
100 year +45% CC +10% A 60 minute winter	147.669	58.739
100 year +45% CC +10% A 120 minute summer	134.215	35.469
100 year +45% CC +10% A 120 minute winter	89.169	35.469
100 year +45% CC +10% A 180 minute summer	101.219	26.047
100 year +45% CC +10% A 180 minute winter	65.795	26.047
100 year +45% CC +10% A 240 minute summer	78.690	20.795
100 year +45% CC +10% A 240 minute winter	52.280	20.795
100 year +45% CC +10% A 360 minute summer	58.701	15.106
100 year +45% CC +10% A 360 minute winter	38.157	15.106
100 year +45% CC +10% A 480 minute summer	45.550	12.038
100 year +45% CC +10% A 480 minute winter	30.262	12.038
100 year +45% CC +10% A 600 minute summer	36.875	10.086
100 year +45% CC +10% A 600 minute winter	25.195	10.086
100 year +45% CC +10% A 720 minute summer	32.556	8.725
100 year +45% CC +10% A 720 minute winter	21.879	8.725
100 year +45% CC +10% A 960 minute summer	26.340	6.936
100 year +45% CC +10% A 960 minute winter	17.448	6.936

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +45% CC +10% A 1440 minute summer	18.700	5.012
100 year +45% CC +10% A 1440 minute winter	12.567	5.012

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	12	41.835	0.035	7.2	1.2271	0.0000	OK
15 minute winter	2	11	40.500	0.063	12.2	0.3864	0.0000	OK
15 minute winter	3	11	40.463	0.083	18.7	0.5086	0.0000	OK
15 minute winter	4	12	40.443	0.094	24.8	0.5748	0.0000	OK
15 minute winter	5	12	40.413	0.105	30.7	0.6428	0.0000	OK
15 minute winter	6	12	40.379	0.114	36.1	0.6941	0.0000	OK
15 minute winter	7	10	40.373	0.049	7.2	0.2969	0.0000	OK
15 minute winter	8	12	40.362	0.071	14.1	0.4276	0.0000	OK
15 minute winter	9	12	40.358	0.110	20.6	0.6657	0.0000	OK
15 minute winter	10	12	40.356	0.148	58.1	0.9004	0.0000	OK
60 minute winter	11	58	40.345	0.173	39.2	1.0475	0.0000	OK
60 minute winter	12	59	40.345	0.230	42.6	1.3875	0.0000	OK
60 minute winter	13	59	40.345	0.258	44.8	1.5511	0.0000	OK
60 minute winter	14	59	40.344	0.284	46.4	1.7079	0.0000	OK
60 minute winter	15	59	40.345	0.201	7.9	1.2355	0.0000	OK
60 minute winter	16	58	40.346	0.248	10.0	1.5114	0.0000	OK
60 minute winter	17	62	40.345	0.277	12.2	1.6792	0.0000	OK
60 minute winter	18	58	40.344	0.331	51.6	1.9835	0.0000	OK
60 minute winter	19	60	40.345	0.419	49.3	2.4954	0.0000	OK
60 minute winter	20	60	40.345	0.452	40.4	2.6889	0.0000	OK
60 minute winter	21	60	40.345	0.472	36.4	2.8068	0.0000	OK
60 minute winter	22	60	40.345	0.520	30.8	3.0931	0.0000	OK
60 minute winter	HB1	61	40.345	0.572	21.4	3.4000	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	5.7	1.279	0.028	0.0594	
15 minute winter	2	1.001	3	11.9	0.428	0.006	0.6323	
15 minute winter	3	1.002	4	18.0	0.488	0.009	0.4525	
15 minute winter	4	1.003	5	24.3	0.554	0.011	0.7036	
15 minute winter	5	1.004	6	30.4	0.604	0.014	0.8495	
15 minute winter	6	1.005	10	35.8	0.542	0.017	1.5139	
15 minute winter	7	2.000	8	6.9	0.348	0.003	0.2648	
15 minute winter	8	2.001	9	13.4	0.438	0.006	0.6656	
15 minute winter	9	2.002	10	17.6	0.372	0.008	1.0325	
15 minute winter	10	1.006	11	57.7	0.717	0.027	1.1490	
15 minute winter	11	1.008	12	62.4	0.714	0.029	1.9621	
15 minute winter	12	1.009	13	67.1	0.698	0.032	1.0840	
15 minute winter	13	1.010	14	71.9	0.742	0.034	1.2877	
15 minute winter	14	1.011	18	76.4	0.767	0.036	2.9278	
30 minute summer	15	3.000	16	-10.0	0.323	-0.005	1.8606	
30 minute summer	16	3.001	17	-17.1	0.410	-0.008	1.5774	
15 minute winter	17	3.002	18	-25.0	0.387	-0.012	3.3427	
15 minute winter	18	1.012	19	86.9	0.787	0.041	7.6722	
15 minute summer	19	1.013	20	68.1	0.688	0.032	3.4298	
15 minute winter	20	1.014	21	59.9	0.669	0.028	2.5655	
15 minute winter	21	1.015	22	48.1	0.554	0.023	6.8465	
15 minute summer	22	1.016	HB1	28.6	0.323	0.013	7.8816	
30 minute summer	HB1	Hydro-Brake®	OF	13.4				88.9

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OF	1	39.654	0.000	13.4	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	HB1	Hydro-Brake®	OF	0.0				0.0

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	11	41.858	0.058	17.6	2.1399	0.0000	OK
120 minute winter	2	98	40.678	0.241	10.9	1.4768	0.0000	OK
120 minute winter	3	98	40.678	0.298	16.4	1.8226	0.0000	OK
120 minute winter	4	100	40.678	0.329	21.0	2.0188	0.0000	OK
120 minute winter	5	100	40.678	0.370	25.8	2.2747	0.0000	OK
120 minute winter	6	100	40.678	0.413	28.8	2.5234	0.0000	OK
120 minute winter	7	114	40.679	0.355	5.5	2.1331	0.0000	OK
120 minute winter	8	114	40.678	0.387	9.7	2.3363	0.0000	OK
120 minute winter	9	114	40.678	0.430	13.4	2.6015	0.0000	OK
120 minute winter	10	114	40.678	0.470	40.7	2.8509	0.0000	OK
120 minute winter	11	114	40.678	0.506	41.7	3.0694	0.0000	OK
120 minute winter	12	100	40.678	0.563	41.3	3.3957	0.0000	OK
120 minute winter	13	100	40.678	0.591	39.8	3.5559	0.0000	OK
120 minute winter	14	100	40.678	0.618	39.8	3.7100	0.0000	OK
120 minute winter	15	114	40.678	0.534	5.5	3.2810	0.0000	OK
120 minute winter	16	98	40.678	0.580	7.8	3.5398	0.0000	OK
120 minute winter	17	114	40.678	0.610	9.2	3.6983	0.0000	OK
120 minute winter	18	100	40.678	0.665	38.8	3.9787	0.0000	OK
120 minute winter	19	100	40.678	0.752	28.3	4.4770	0.0000	OK
120 minute winter	20	100	40.678	0.785	24.3	4.6674	0.0000	OK
120 minute winter	21	100	40.678	0.805	23.7	4.7854	0.0000	OK
120 minute winter	22	100	40.678	0.853	24.5	5.0769	0.0000	OK
120 minute winter	HB1	100	40.678	0.905	23.9	5.3790	0.0000	SURCHARGED
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	15.5	1.695	0.074	0.1210	
15 minute winter	2	1.001	3	31.7	0.511	0.015	1.6421	
15 minute winter	3	1.002	4	47.2	0.570	0.022	1.2707	
15 minute winter	4	1.003	5	62.3	0.645	0.029	2.1202	
15 minute winter	5	1.004	6	76.6	0.679	0.036	2.8125	
15 minute winter	6	1.005	10	89.3	0.629	0.042	4.8149	
15 minute summer	7	2.000	8	14.2	0.382	0.007	1.5222	
15 minute winter	8	2.001	9	26.4	0.467	0.012	3.1418	
15 minute winter	9	2.002	10	39.4	0.397	0.019	3.4543	
15 minute winter	10	1.006	11	140.9	0.814	0.066	3.6456	
15 minute winter	11	1.008	12	150.9	0.799	0.071	6.9168	
15 minute winter	12	1.009	13	150.2	0.785	0.071	3.9774	
15 minute winter	13	1.010	14	159.3	0.828	0.075	4.1341	
15 minute winter	14	1.011	18	159.7	0.876	0.075	8.0887	
15 minute summer	15	3.000	16	-22.3	0.393	-0.011	5.4902	
15 minute winter	16	3.001	17	-44.2	0.478	-0.021	4.4927	
15 minute winter	17	3.002	18	-78.9	0.432	-0.037	9.2535	
15 minute winter	18	1.012	19	149.6	0.851	0.070	17.5272	
15 minute winter	19	1.013	20	111.4	0.685	0.052	7.6723	
15 minute summer	20	1.014	21	88.9	0.657	0.042	4.6338	
15 minute summer	21	1.015	22	73.3	0.562	0.035	11.7510	
15 minute summer	22	1.016	HB1	33.2	0.327	0.016	13.8923	
120 minute winter	HB1	Hydro-Brake®	OF	14.2				266.9

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OF	1	39.654	0.000	13.4	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	HB1	Hydro-Brake®	OF	8.3				64.8

Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 98.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	11	41.887	0.087	36.5	3.4672	0.0000	OK
180 minute winter	2	172	41.716	1.279	17.0	7.8885	0.0000	SURCHARGED
180 minute winter	3	172	41.716	1.336	19.5	8.2219	0.0000	SURCHARGED
180 minute winter	4	172	41.716	1.367	19.6	8.4465	0.0000	SURCHARGED
180 minute winter	5	172	41.716	1.408	21.0	8.7167	0.0000	SURCHARGED
180 minute winter	6	172	41.716	1.451	22.1	8.9183	0.0000	SURCHARGED
180 minute winter	7	172	41.716	1.392	8.5	8.4130	0.0000	SURCHARGED
180 minute winter	8	172	41.716	1.425	13.1	8.6366	0.0000	SURCHARGED
180 minute winter	9	172	41.716	1.468	14.1	8.9234	0.0000	SURCHARGED
180 minute winter	10	172	41.716	1.508	27.6	9.1936	0.0000	SURCHARGED
180 minute winter	11	172	41.716	1.544	28.5	9.4203	0.0000	SURCHARGED
180 minute winter	12	172	41.716	1.601	30.7	9.7103	0.0000	SURCHARGED
180 minute winter	13	172	41.716	1.629	32.7	9.8524	0.0000	SURCHARGED
180 minute winter	14	172	41.716	1.656	34.5	9.9902	0.0000	SURCHARGED
180 minute winter	15	172	41.715	1.571	8.5	9.7191	0.0000	SURCHARGED
180 minute winter	16	172	41.715	1.617	12.6	9.9265	0.0000	SURCHARGED
180 minute winter	17	172	41.716	1.648	13.8	10.0437	0.0000	SURCHARGED
180 minute winter	18	172	41.716	1.703	38.4	10.2356	0.0000	SURCHARGED
180 minute winter	19	176	41.716	1.790	39.7	26.2836	0.0000	SURCHARGED
180 minute winter	20	176	41.716	1.823	26.9	10.8798	0.0000	SURCHARGED
180 minute winter	21	176	41.716	1.843	27.7	10.9973	0.0000	SURCHARGED
180 minute winter	22	176	41.716	1.891	29.2	11.3005	0.0000	SURCHARGED
180 minute winter	HB1	176	41.716	1.943	30.2	11.5953	0.0000	SURCHARGED
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	33.6	2.085	0.161	0.2132	
15 minute winter	2	1.001	3	63.6	0.532	0.030	10.2444	
15 minute winter	3	1.002	4	91.2	0.595	0.043	6.1593	
15 minute winter	4	1.003	5	118.2	0.682	0.056	8.6775	
15 minute summer	5	1.004	6	139.3	0.719	0.066	8.2095	
15 minute summer	6	1.005	10	158.0	0.669	0.074	12.2079	
15 minute winter	7	2.000	8	27.7	0.384	0.013	7.2743	
15 minute winter	8	2.001	9	-50.4	0.484	-0.024	10.3429	
15 minute winter	9	2.002	10	68.5	0.426	0.032	10.1509	
15 minute winter	10	1.006	11	237.0	0.851	0.112	9.7548	
15 minute winter	11	1.008	12	245.0	0.831	0.115	16.4300	
15 minute summer	12	1.009	13	237.1	0.805	0.112	7.7072	
15 minute summer	13	1.010	14	240.4	0.874	0.113	7.7958	
15 minute winter	14	1.011	18	226.4	0.901	0.107	16.1392	
30 minute winter	15	3.000	16	38.0	0.326	0.018	18.0616	
30 minute winter	16	3.001	17	70.0	0.430	0.033	12.1345	
15 minute winter	17	3.002	18	-118.1	0.466	-0.056	18.8045	
15 minute winter	18	1.012	19	177.6	0.855	0.084	32.0435	
15 minute summer	19	1.013	20	130.0	0.693	0.061	12.2663	
15 minute winter	20	1.014	21	119.0	0.663	0.056	8.1395	
15 minute winter	21	1.015	22	101.2	0.562	0.048	19.7215	
15 minute summer	22	1.016	HB1	47.1	0.317	0.022	21.1052	
180 minute winter	HB1	Hydro-Brake®	OF	20.4				402.9

Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 98.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	OF	1	39.654	0.000	15.3	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	HB1	Hydro-Brake®	OF	9.0				107.3