

### Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	0.900
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

### Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.022	5.00	7.740	1200	516670.778	173456.118	1.125
2	0.016	5.00	7.790	1200	516661.212	173469.543	1.273
3			7.950	1200	516649.488	173470.964	1.478
4	0.007	5.00	7.790	1200	516662.872	173481.154	1.418
5	0.006	5.00	7.750	1200	516653.756	173493.940	1.471
6			7.670	1200	516652.409	173503.358	1.448
Depth/Area 1	0.023	5.00	8.000		516654.032	173464.565	1.506

### 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	16.485	0.600	6.615	6.517	0.098	168.2	225	5.27	50.0
1.001	2	Depth/Area 1	3.800	0.600	6.517	6.494	0.023	165.2	225	5.34	50.0
1.002	Depth/Area 1	3	3.600	0.600	6.494	6.472	0.022	163.6	225	5.39	50.0
1.003	3	4	16.822	0.600	6.472	6.372	0.100	168.2	225	5.67	50.0
1.004	4	5	15.703	0.600	6.372	6.279	0.093	168.8	225	5.93	50.0
1.005	5	6	9.514	0.600	6.279	6.222	0.057	166.9	225	6.09	49.7

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	1.005	40.0	3.0	0.900	1.048	0.022	0.0	42	0.596
1.001	1.014	40.3	5.1	1.048	1.281	0.038	0.0	54	0.700
1.002	1.019	40.5	8.3	1.281	1.253	0.061	0.0	69	0.805
1.003	1.005	40.0	8.3	1.253	1.193	0.061	0.0	69	0.794
1.004	1.003	39.9	9.2	1.193	1.246	0.068	0.0	73	0.819
1.005	1.009	40.1	10.0	1.246	1.223	0.074	0.0	76	0.839

### 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	16.485	168.2	225	Circular	7.740	6.615	0.900	7.790	6.517	1.048
1.001	3.800	165.2	225	Circular	7.790	6.517	1.048	8.000	6.494	1.281
1.002	3.600	163.6	225	Circular	8.000	6.494	1.281	7.950	6.472	1.253
1.003	16.822	168.2	225	Circular	7.950	6.472	1.253	7.790	6.372	1.193
1.004	15.703	168.8	225	Circular	7.790	6.372	1.193	7.750	6.279	1.246
1.005	9.514	166.9	225	Circular	7.750	6.279	1.246	7.670	6.222	1.223

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1200	Manhole	Adoptable	2	1200	Manhole	Adoptable
1.001	2	1200	Manhole	Adoptable	Depth/Area 1		Junction	
1.002	Depth/Area 1		Junction		3	1200	Manhole	Adoptable
1.003	3	1200	Manhole	Adoptable	4	1200	Manhole	Adoptable
1.004	4	1200	Manhole	Adoptable	5	1200	Manhole	Adoptable
1.005	5	1200	Manhole	Adoptable	6	1200	Manhole	Adoptable

### Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	516670.778	173456.118	7.740	1.125	1200					
						0	1.000	6.615	225	
2	516661.212	173469.543	7.790	1.273	1200		1	1.000	6.517	225
						0	1.001	6.517	225	
3	516649.488	173470.964	7.950	1.478	1200		1	1.002	6.472	225
						0	1.003	6.472	225	
4	516662.872	173481.154	7.790	1.418	1200		1	1.003	6.372	225
						0	1.004	6.372	225	
5	516653.756	173493.940	7.750	1.471	1200		1	1.004	6.279	225
						0	1.005	6.279	225	
6	516652.409	173503.358	7.670	1.448	1200		1	1.005	6.222	225
Depth/Area 1	516654.032	173464.565	8.000	1.506			1	1.001	6.494	225
						0	1.002	6.494	225	

### Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Normal	Additional Storage (m <sup>3</sup> /ha)	20.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Volume	x

### Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

### Node 5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	6.279	Product Number	CTL-SHE-0020-2000-1000-2000
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.2	Min Node Diameter (mm)	1200

### Node Depth/Area 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	6.494
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	65.0	0.0	1.000	65.0	0.0	1.001	0.0	0.0

**Results for 2 year Critical Storm Duration. Lowest mass balance: 99.66%**

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
600 minute winter	1	570	6.673	0.058	0.4	0.0885	0.0000	OK
600 minute winter	2	570	6.673	0.156	0.7	0.2158	0.0000	OK
600 minute winter	3	570	6.673	0.201	0.4	0.2275	0.0000	OK
600 minute winter	4	570	6.673	0.301	0.4	0.3704	0.0000	SURCHARGED
600 minute winter	5	570	6.673	0.394	0.2	0.4781	0.0000	SURCHARGED
15 minute summer	6	1	6.222	0.000	0.1	0.0000	0.0000	OK
600 minute winter	Depth/Area 1	570	6.673	0.179	1.1	11.1164	0.0000	OK

Link Event (Velocity)	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	2.9	0.487	0.073	0.0995	
15 minute summer	2	1.001	Depth/Area 1	4.8	1.202	0.118	0.0192	
30 minute winter	3	1.003	4	2.5	0.315	0.063	0.4088	
120 minute summer	4	1.004	5	0.5	0.291	0.014	0.6244	
600 minute winter	5	Hydro-Brake®	6	0.1				5.7
15 minute winter	Depth/Area 1	1.002	3	2.9	0.581	0.071	0.0288	

**Results for 30 year Critical Storm Duration. Lowest mass balance: 99.66%**

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
480 minute winter	1	472	6.944	0.329	1.0	0.5006	0.0000	SURCHARGED
480 minute winter	2	472	6.944	0.427	1.6	0.5900	0.0000	SURCHARGED
480 minute winter	3	472	6.944	0.472	0.5	0.5337	0.0000	SURCHARGED
480 minute winter	4	472	6.944	0.572	0.5	0.7035	0.0000	SURCHARGED
480 minute winter	5	472	6.944	0.665	0.3	0.8065	0.0000	SURCHARGED
15 minute summer	6	1	6.222	0.000	0.1	0.0000	0.0000	OK
480 minute winter	Depth/Area 1	472	6.944	0.450	2.7	27.9195	0.0000	SURCHARGED

Link Event (Velocity)	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	8.4	0.650	0.210	0.2553	
15 minute summer	2	1.001	Depth/Area 1	13.8	1.342	0.341	0.0920	
60 minute winter	3	1.003	4	2.1	0.324	0.053	0.6690	
240 minute winter	4	1.004	5	0.4	0.252	0.010	0.6245	
480 minute winter	5	Hydro-Brake®	6	0.2				6.1
15 minute summer	Depth/Area 1	1.002	3	6.2	0.746	0.152	0.1045	

**Results for 100 year Critical Storm Duration. Lowest mass balance: 99.66%**

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
720 minute winter	1	705	7.123	0.508	0.9	0.7738	0.0000	SURCHARGED
720 minute winter	2	705	7.123	0.606	1.4	0.8381	0.0000	SURCHARGED
720 minute winter	3	705	7.123	0.651	0.5	0.7368	0.0000	SURCHARGED
720 minute winter	4	705	7.123	0.751	0.6	0.9243	0.0000	SURCHARGED
720 minute winter	5	705	7.123	0.844	0.3	1.0243	0.0000	SURCHARGED
15 minute summer	6	1	6.222	0.000	0.1	0.0000	0.0000	OK
720 minute winter	Depth/Area 1	705	7.123	0.629	2.5	39.0597	0.0000	SURCHARGED

Link Event (Velocity)	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	10.9	0.691	0.274	0.4330	
15 minute summer	2	1.001	Depth/Area 1	18.0	1.376	0.447	0.1280	
60 minute winter	3	1.003	4	-2.5	0.321	-0.063	0.6690	
360 minute winter	4	1.004	5	0.4	0.237	0.011	0.6245	
720 minute winter	5	Hydro-Brake®	6	0.2				8.7
15 minute summer	Depth/Area 1	1.002	3	5.5	0.745	0.137	0.1344	

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.66%**

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
960 minute winter	1	945	7.424	0.809	1.0	1.2318	0.0000	SURCHARGED
960 minute winter	2	945	7.424	0.907	1.6	1.2539	0.0000	SURCHARGED
960 minute winter	3	945	7.424	0.952	0.5	1.0771	0.0000	SURCHARGED
960 minute winter	4	945	7.424	1.052	0.5	1.2943	0.0000	SURCHARGED
960 minute winter	5	945	7.424	1.145	0.3	1.3893	0.0000	SURCHARGED
15 minute summer	6	1	6.222	0.000	0.1	0.0000	0.0000	OK
960 minute winter	Depth/Area 1	945	7.424	0.930	2.8	57.7307	0.0000	SURCHARGED

Link Event (Velocity)	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	15.5	0.731	0.389	0.6249	
15 minute summer	2	1.001	Depth/Area 1	23.7	1.405	0.589	0.1511	
60 minute summer	3	1.003	4	-4.4	0.321	-0.111	0.6690	
240 minute winter	4	1.004	5	0.8	0.252	0.021	0.6245	
960 minute winter	5	Hydro-Brake®	6	0.2				12.1
15 minute winter	Depth/Area 1	1.002	3	-7.1	0.770	-0.176	0.1432	