

Design Settings

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

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.012	5.00	80.430	1200	345395.800	339983.800	1.070
2	0.009	5.00	81.658	1200	345407.380	339943.960	2.710
3	0.006	5.00	81.622	1200	345431.470	339915.032	1.256
4	0.003	5.00	81.382	1200	345428.400	339931.300	2.678
5	0.000		80.735	1200	345442.650	339938.800	2.138
6	0.010	5.00	79.390	1200	345458.020	339936.700	0.896
7	0.000		78.731	1200	345461.836	339941.342	0.650
8	0.000		78.636	1200	345471.095	339958.000	0.650
9	0.000		75.639	1200	345483.171	340003.215	0.639
9_OUT			75.000	1200	345487.505	340007.928	0.320

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	41.489	0.600	79.360	78.948	0.412	100.7	150	5.69	48.6
1.001	2	4	24.538	0.600	78.948	78.704	0.244	100.6	150	6.10	46.9
2.000	3	4	16.555	0.600	80.366	78.704	1.662	10.0	150	5.09	50.0
1.002	4	5	16.103	0.600	78.704	78.597	0.107	150.0	150	6.43	45.7
1.003	5	6	15.513	0.600	78.597	78.494	0.103	150.6	150	6.74	44.6
1.004	6	7	6.009	0.600	78.494	78.081	0.413	14.6	150	6.78	44.5
1.005	7	8	19.058	0.600	78.081	77.986	0.095	200.0	150	7.23	43.1
1.006	8	9	46.800	0.600	77.986	75.000	2.986	15.7	150	7.54	42.2
1.007	9	9_OUT	6.403	0.600	75.000	74.680	0.320	20.0	150	7.58	42.1

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	1.001	17.7	1.6	0.920	2.560	0.012	0.0
1.001	1.002	17.7	2.7	2.560	2.528	0.021	0.0
2.000	3.211	56.7	0.8	1.106	2.528	0.006	0.0
1.002	0.818	14.5	3.7	2.528	1.988	0.030	0.0
1.003	0.816	14.4	3.6	1.988	0.746	0.030	0.0
1.004	2.654	46.9	4.8	0.746	0.500	0.040	0.0
1.005	0.707	12.5	4.7	0.500	0.500	0.040	0.0
1.006	2.557	45.2	4.6	0.500	0.489	0.040	0.0
1.007	2.262	40.0	4.6	0.489	0.170	0.040	0.0

Pipeline Schedule

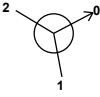
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	41.489	100.7	150	Circular	80.430	79.360	0.920	81.658	78.948	2.560
1.001	24.538	100.6	150	Circular	81.658	78.948	2.560	81.382	78.704	2.528
2.000	16.555	10.0	150	Circular	81.622	80.366	1.106	81.382	78.704	2.528
1.002	16.103	150.0	150	Circular	81.382	78.704	2.528	80.735	78.597	1.988
1.003	15.513	150.6	150	Circular	80.735	78.597	1.988	79.390	78.494	0.746
1.004	6.009	14.6	150	Circular	79.390	78.494	0.746	78.731	78.081	0.500
1.005	19.058	200.0	150	Circular	78.731	78.081	0.500	78.636	77.986	0.500
1.006	46.800	15.7	150	Circular	78.636	77.986	0.500	75.639	75.000	0.489
1.007	6.403	20.0	150	Circular	75.639	75.000	0.489	75.000	74.680	0.170

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	4	1200	Manhole	Adoptable
2.000	3	1200	Manhole	Adoptable	4	1200	Manhole	Adoptable
1.002	4	1200	Manhole	Adoptable	5	1200	Manhole	Adoptable
1.003	5	1200	Manhole	Adoptable	6	1200	Manhole	Adoptable
1.004	6	1200	Manhole	Adoptable	7	1200	Manhole	Adoptable
1.005	7	1200	Manhole	Adoptable	8	1200	Manhole	Adoptable
1.006	8	1200	Manhole	Adoptable	9	1200	Manhole	Adoptable
1.007	9	1200	Manhole	Adoptable	9_OUT	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	345395.800	339983.800	80.430	1.070	1200		0	1.000	79.360	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
2	345407.380	339943.960	81.658	2.710	1200		1	1.000	78.948	150
							0	1.001	78.948	150
3	345431.470	339915.032	81.622	1.256	1200					
							0	2.000	80.366	150
4	345428.400	339931.300	81.382	2.678	1200		1	2.000	78.704	150
							2	1.001	78.704	150
							0	1.002	78.704	150
5	345442.650	339938.800	80.735	2.138	1200		1	1.002	78.597	150
							0	1.003	78.597	150
6	345458.020	339936.700	79.390	0.896	1200		1	1.003	78.494	150
							0	1.004	78.494	150
7	345461.836	339941.342	78.731	0.650	1200		1	1.004	78.081	150
							0	1.005	78.081	150
8	345471.095	339958.000	78.636	0.650	1200		1	1.005	77.986	150
							0	1.006	77.986	150
9	345483.171	340003.215	75.639	0.639	1200		1	1.006	75.000	150
							0	1.007	75.000	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
9_OUT	345487.505	340007.928	75.000	0.320	1200	1	1.007	74.680	150



Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Normal	Additional Storage (m ³ /ha)	20.0	30 year (l/s)	0.2
Summer CV	0.750	Skip Steady State	✓	Check Discharge Rate(s)	✓	100 year (l/s)	0.2
Winter CV	0.840	Drain Down Time (mins)	240	1 year (l/s)	0.1	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 %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	40	0	0
30	0	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	BFIHost	0.551	Growth Factor 100 year	2.18	Q 30 year (l/s)	0.2
Greenfield Method	FEH	Region	9	Betterment (%)	0	Q 100 year (l/s)	0.2
Positively Drained Area (ha)	0.040	QBar/QMed conversion factor	1.075	QMed	0.1		
SAAR (mm)	703	Growth Factor 1 year	0.88	QBar	0.1		
Host	18	Growth Factor 30 year	1.80	Q 1 year (l/s)	0.1		

Node 8 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	77.986	Product Number	CTL-SHE-0051-1000-0650-1000
Design Depth (m)	0.650	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node 8 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	78.236
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)
0.000	19.0	0.0	0.400	65.0	0.0

Node 8 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	77.986
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	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	19.0	0.0	0.500	19.0	0.0	0.501	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 97.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	11	79.390	0.030	1.6	0.0404	0.0000	OK
15 minute winter	2	11	78.987	0.039	2.7	0.0467	0.0000	OK
15 minute summer	3	10	80.378	0.012	0.8	0.0152	0.0000	OK
15 minute winter	4	11	78.757	0.053	3.8	0.0610	0.0000	OK
15 minute winter	5	12	78.652	0.055	3.7	0.0620	0.0000	OK
15 minute winter	6	12	78.526	0.032	4.7	0.0434	0.0000	OK
30 minute winter	7	30	78.197	0.116	3.9	0.1316	0.0000	OK
30 minute winter	8	30	78.197	0.211	3.9	1.4412	0.0000	SURCHARGED
30 minute winter	9	27	75.017	0.017	1.0	0.0190	0.0000	OK
30 minute winter	9_OUT	27	74.696	0.016	1.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	1.5	0.512	0.087	0.1267	
15 minute winter	2	1.001	4	2.6	0.576	0.149	0.1126	
15 minute summer	3	2.000	4	0.8	0.792	0.014	0.0498	
15 minute winter	4	1.002	5	3.7	0.653	0.253	0.0906	
15 minute winter	5	1.003	6	3.7	0.865	0.253	0.0665	
15 minute winter	6	1.004	7	4.7	0.971	0.100	0.0344	
30 minute winter	7	1.005	8	3.9	0.565	0.312	0.3075	
30 minute winter	8	Hydro-Brake®	9	1.0				
30 minute winter	9	1.007	9_OUT	1.0	0.945	0.025	0.0068	3.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 97.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	79.411	0.051	4.6	0.0694	0.0000	OK
15 minute winter	2	11	79.017	0.069	7.9	0.0831	0.0000	OK
15 minute winter	3	10	80.387	0.021	2.3	0.0253	0.0000	OK
15 minute winter	4	11	78.808	0.104	11.1	0.1204	0.0000	OK
15 minute winter	5	11	78.699	0.102	11.0	0.1153	0.0000	OK
15 minute winter	6	12	78.557	0.063	14.5	0.0851	0.0000	OK
120 minute winter	7	114	78.414	0.333	4.9	0.3767	0.0000	SURCHARGED
120 minute winter	8	118	78.414	0.428	4.8	8.1174	0.0000	FLOOD RISK
15 minute summer	9	84	75.017	0.017	1.0	0.0190	0.0000	OK
15 minute summer	9_OUT	84	74.696	0.016	1.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	4.5	0.681	0.252	0.2745	
15 minute winter	2	1.001	4	7.8	0.747	0.440	0.2585	
15 minute winter	3	2.000	4	2.3	0.781	0.040	0.1201	
15 minute winter	4	1.002	5	11.0	0.853	0.763	0.2081	
15 minute winter	5	1.003	6	10.9	1.117	0.754	0.1523	
15 minute winter	6	1.004	7	14.1	1.184	0.300	0.0739	
120 minute winter	7	1.005	8	4.8	0.533	0.381	0.3355	
120 minute winter	8	Hydro-Brake®	9	1.0				
15 minute summer	9	1.007	9_OUT	1.0	0.945	0.025	0.0068	6.3

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 97.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	79.435	0.075	9.0	0.1010	0.0000	OK
15 minute winter	2	12	79.194	0.246	15.6	0.2944	0.0000	SURCHARGED
15 minute winter	3	10	80.395	0.029	4.5	0.0351	0.0000	OK
15 minute winter	4	13	79.079	0.375	19.5	0.4325	0.0000	SURCHARGED
15 minute winter	5	13	78.925	0.328	16.7	0.3714	0.0000	SURCHARGED
15 minute winter	6	13	78.775	0.281	22.1	0.3801	0.0000	SURCHARGED
30 minute winter	7	22	78.669	0.588	18.8	0.6647	0.0000	FLOOD RISK
120 minute winter	8	122	78.631	0.645	9.3	20.0698	0.0000	FLOOD RISK
15 minute summer	9	200	75.017	0.017	1.0	0.0190	0.0000	OK
15 minute summer	9_OUT	200	74.696	0.016	1.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	8.8	0.796	0.497	0.5438	
15 minute winter	2	1.001	4	13.0	0.811	0.737	0.4320	
15 minute winter	3	2.000	4	4.5	0.669	0.079	0.1650	
15 minute winter	4	1.002	5	16.7	0.951	1.158	0.2835	
15 minute winter	5	1.003	6	15.7	1.102	1.088	0.2731	
15 minute winter	6	1.004	7	20.7	1.214	0.442	0.1058	
30 minute winter	7	1.005	8	18.3	1.038	1.463	0.3355	
120 minute winter	8	Hydro-Brake®	9	1.0				
15 minute summer	9	1.007	9_OUT	1.0	0.945	0.025	0.0068	12.4