

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)	0.500
CV	0.900	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
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	0.019	5.00	66.123	1200	468535.852	112546.455	1.350
2	0.073	5.00	64.952	1200	468567.233	112556.160	1.400
3	0.016	5.00	63.318	1200	468586.857	112573.493	1.475
4	0.044	5.00	61.006	1200	468613.959	112564.905	1.475
5	0.000		59.877	1200	468629.444	112567.551	1.475
6	0.024	5.00	59.307	1200	468639.108	112559.517	1.947
7	0.074	5.00	58.863	1200	468652.773	112520.332	1.503
8	0.021	5.00	62.550	1200	468605.521	112498.999	1.350
9	0.000		62.081	1200	468610.126	112514.915	1.350
10	0.038	5.00	61.073	1200	468625.826	112520.104	1.350
11	0.000		59.367	1200	468643.617	112526.366	1.350
12	0.000		58.850	1200	468647.596	112515.600	1.490
13	0.000		58.700	1200	468651.586	112504.283	1.340
14	0.000		58.550	1200	468651.573	112497.770	1.190
15	0.054	5.00	58.200	1200	468654.233	112490.225	0.840
16	0.000		58.400	1200	468666.468	112479.639	1.136
17	0.000		58.500	1200	468666.773	112476.146	1.257
17_OUT	0.000		58.170	1200	468675.491	112461.679	1.060

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	32.848	0.600	64.773	63.552	1.221	26.9	150	5.28	50.0
1.001	2	3	26.183	0.600	63.552	61.918	1.634	16.0	150	5.45	50.0
1.002	3	4	28.430	0.600	61.843	59.531	2.312	12.3	225	5.58	50.0
1.003	4	5	15.710	0.600	59.531	58.402	1.129	13.9	225	5.65	50.0
1.004	5	6	12.566	0.600	58.402	57.832	0.570	22.0	225	5.73	50.0
1.005	6	7	41.500	0.300	57.360	57.360	0.000	0.0	6650	6.42	50.0
1.006	7	12	7.013	0.600	57.360	57.360	0.000	0.0	225	6.54	49.6

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)
1.000	1.949	34.4	3.1	1.200	1.250	0.019	0.0	30	1.208
1.001	2.529	44.7	15.0	1.250	1.250	0.092	0.0	59	2.277
1.002	3.751	149.2	17.6	1.250	1.250	0.108	0.0	51	2.526
1.003	3.526	140.2	24.7	1.250	1.250	0.152	0.0	64	2.675
1.004	2.798	111.3	24.7	1.250	1.250	0.152	0.0	72	2.260
1.005	1.000	5320.0	28.6	1.147	0.703	0.176	0.0	0	∞
1.006	1.000	39.8	40.3	1.278	1.265	0.250	0.0	0	∞

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)
2.000	8	9	16.569	0.600	61.200	60.731	0.469	35.3	150	5.16	50.0
2.001	9	10	16.536	0.600	60.731	59.723	1.008	16.4	150	5.27	50.0
2.002	10	11	18.861	0.600	59.723	58.017	1.706	11.1	150	5.38	50.0
2.003	11	12	11.478	0.600	58.017	57.485	0.532	21.6	150	5.46	50.0
1.007	12	13	12.000	0.300	57.360	57.360	0.000	0.0	5700	6.74	48.9
1.008	13	14	6.513	0.600	57.360	57.360	0.000	0.0	300	6.85	48.5
1.009	14	15	8.000	0.300	57.360	57.360	0.000	0.0	5700	6.98	48.0
1.010	15	16	16.179	0.600	57.360	57.264	0.096	168.5	225	7.25	47.2
1.011	16	17	3.506	0.600	57.264	57.243	0.021	167.0	225	7.31	47.0
1.012	17	17_OUT	16.890	0.600	57.243	57.110	0.133	127.0	225	7.55	46.3

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)
2.000	1.699	30.0	3.4	1.200	1.200	0.021	0.0	34	1.135
2.001	2.499	44.2	3.4	1.200	1.200	0.021	0.0	28	1.496
2.002	3.047	53.8	9.6	1.200	1.200	0.059	0.0	42	2.303
2.003	2.177	38.5	9.6	1.200	1.215	0.059	0.0	51	1.808
1.007	1.000	4560.0	49.1	0.690	0.540	0.309	0.0	0	∞
1.008	1.000	70.7	48.7	1.040	0.890	0.309	0.0	0	∞
1.009	1.000	2280.0	48.2	0.790	0.440	0.309	0.0	0	∞
1.010	1.004	39.9	55.7	0.615	0.911	0.363	0.0	225	1.023
1.011	1.009	40.1	55.5	0.911	1.032	0.363	0.0	225	1.028
1.012	1.159	46.1	54.6	1.032	0.835	0.363	0.0	225	1.180

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	32.848	26.9	150	Circular	66.123	64.773	1.200	64.952	63.552	1.250
1.001	26.183	16.0	150	Circular	64.952	63.552	1.250	63.318	61.918	1.250
1.002	28.430	12.3	225	Circular	63.318	61.843	1.250	61.006	59.531	1.250
1.003	15.710	13.9	225	Circular	61.006	59.531	1.250	59.877	58.402	1.250
1.004	12.566	22.0	225	Circular	59.877	58.402	1.250	59.307	57.832	1.250
1.005	41.500	0.0	6650	Crate Storage 1	59.307	57.360	1.147	58.863	57.360	0.703
1.006	7.013	0.0	225	Circular	58.863	57.360	1.278	58.850	57.360	1.265
2.000	16.569	35.3	150	Circular	62.550	61.200	1.200	62.081	60.731	1.200
2.001	16.536	16.4	150	Circular	62.081	60.731	1.200	61.073	59.723	1.200
2.002	18.861	11.1	150	Circular	61.073	59.723	1.200	59.367	58.017	1.200

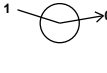
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1200	Manhole	Adoptable	2	1200	Manhole	Adoptable
1.001	2	1200	Manhole	Adoptable	3	1200	Manhole	Adoptable
1.002	3	1200	Manhole	Adoptable	4	1200	Manhole	Adoptable
1.003	4	1200	Manhole	Adoptable	5	1200	Manhole	Adoptable
1.004	5	1200	Manhole	Adoptable	6	1200	Manhole	Adoptable
1.005	6	1200	Manhole	Adoptable	7	1200	Manhole	Adoptable
1.006	7	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
2.000	8	1200	Manhole	Adoptable	9	1200	Manhole	Adoptable
2.001	9	1200	Manhole	Adoptable	10	1200	Manhole	Adoptable
2.002	10	1200	Manhole	Adoptable	11	1200	Manhole	Adoptable

Pipeline Schedule

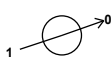
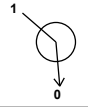
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
2.003	11.478	21.6	150	Circular	59.367	58.017	1.200	58.850	57.485	1.215
1.007	12.000	0.0	5700	Crate Storage 2	58.850	57.360	0.690	58.700	57.360	0.540
1.008	6.513	0.0	300	Circular	58.700	57.360	1.040	58.550	57.360	0.890
1.009	8.000	0.0	5700	Crate Storage 3	58.550	57.360	0.790	58.200	57.360	0.440
1.010	16.179	168.5	225	Circular	58.200	57.360	0.615	58.400	57.264	0.911
1.011	3.506	167.0	225	Circular	58.400	57.264	0.911	58.500	57.243	1.032
1.012	16.890	127.0	225	Circular	58.500	57.243	1.032	58.170	57.110	0.835

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.003	11	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
1.007	12	1200	Manhole	Adoptable	13	1200	Manhole	Adoptable
1.008	13	1200	Manhole	Adoptable	14	1200	Manhole	Adoptable
1.009	14	1200	Manhole	Adoptable	15	1200	Manhole	Adoptable
1.010	15	1200	Manhole	Adoptable	16	1200	Manhole	Adoptable
1.011	16	1200	Manhole	Adoptable	17	1200	Manhole	Adoptable
1.012	17	1200	Manhole	Adoptable	17_OUT	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	468535.852	112546.455	66.123	1.350	1200		0	1.000	64.773	150
2	468567.233	112556.160	64.952	1.400	1200		1	1.000	63.552	150
						0	1.001	63.552	150	
3	468586.857	112573.493	63.318	1.475	1200		1	1.001	61.918	150
						0	1.002	61.843	225	
4	468613.959	112564.905	61.006	1.475	1200		1	1.002	59.531	225
						0	1.003	59.531	225	
5	468629.444	112567.551	59.877	1.475	1200		1	1.003	58.402	225
						0	1.004	58.402	225	
6	468639.108	112559.517	59.307	1.947	1200		1	1.004	57.832	225
						0	1.005	57.360	6650	
7	468652.773	112520.332	58.863	1.503	1200		1	1.005	57.360	6650
						0	1.006	57.360	225	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
8	468605.521	112498.999	62.550	1.350	1200		0	2.000	61.200	150
9	468610.126	112514.915	62.081	1.350	1200		1	2.000	60.731	150
10	468625.826	112520.104	61.073	1.350	1200		0	2.001	60.731	150
11	468643.617	112526.366	59.367	1.350	1200		1	2.001	59.723	150
12	468647.596	112515.600	58.850	1.490	1200		0	2.002	59.723	150
13	468651.586	112504.283	58.700	1.340	1200		1	2.002	58.017	150
14	468651.573	112497.770	58.550	1.190	1200		0	2.003	58.017	150
15	468654.233	112490.225	58.200	0.840	1200		1	2.003	57.485	150
16	468666.468	112479.639	58.400	1.136	1200		2	1.006	57.360	225
17	468666.773	112476.146	58.500	1.257	1200		0	1.007	57.360	5700
17_OUT	468675.491	112461.679	58.170	1.060	1200		1	1.007	57.360	5700

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Detailed	Additional Storage (m³/ha)	20.0
Summer CV	0.900	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.950	Drain Down Time (mins)	2000	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 %)
10	0	0	0
30	40	0	0
100	40	0	0

Node 15 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	57.360	Product Number	CTL-SHE-0070-2000-0800-2000
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	64.815	0.042	5.9	0.0590	0.0000	OK
15 minute summer	2	10	63.642	0.090	28.4	0.1957	0.0000	OK
15 minute summer	3	10	61.914	0.071	33.0	0.0964	0.0000	OK
15 minute summer	4	10	59.622	0.091	46.5	0.1571	0.0000	OK
15 minute summer	5	10	58.513	0.111	46.2	0.1252	0.0000	OK
480 minute winter	6	448	57.637	0.277	6.4	0.3820	0.0000	OK
480 minute winter	7	448	57.637	0.277	5.2	0.5866	0.0000	SURCHARGED
15 minute summer	8	10	61.251	0.051	6.5	0.0728	0.0000	OK
15 minute summer	9	10	60.770	0.039	6.4	0.0437	0.0000	OK
15 minute summer	10	10	59.783	0.060	18.2	0.1015	0.0000	OK
15 minute summer	11	10	58.094	0.077	18.1	0.0876	0.0000	OK
480 minute winter	12	448	57.637	0.277	3.5	0.3134	0.0000	OK
480 minute winter	13	448	57.637	0.277	2.5	0.3134	0.0000	OK
480 minute winter	14	448	57.637	0.277	1.8	0.3134	0.0000	OK
480 minute winter	15	448	57.637	0.277	2.7	0.6697	0.0000	SURCHARGED
360 minute summer	16	416	57.300	0.036	2.0	0.0407	0.0000	OK
1440 minute winter	17	1200	57.275	0.032	2.0	0.0366	0.0000	OK
1440 minute winter	17_OUT	1200	57.142	0.032	2.0	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 summer	1	1.000	2	5.8	0.783	0.169	0.2471	
15 minute summer	2	1.001	3	28.0	2.605	0.627	0.2814	
15 minute summer	3	1.002	4	32.9	2.548	0.220	0.3674	
15 minute summer	4	1.003	5	46.2	2.681	0.329	0.2707	
15 minute summer	5	1.004	6	46.0	2.519	0.413	0.2294	
480 minute winter	6	1.005	7	2.5	0.012	0.000	76.5123	
480 minute winter	7	1.006	12	1.5	0.090	0.037	0.2789	
15 minute summer	8	2.000	9	6.4	1.472	0.215	0.0728	
15 minute summer	9	2.001	10	6.4	1.273	0.145	0.0839	
15 minute summer	10	2.002	11	18.1	2.300	0.336	0.1484	
15 minute summer	11	2.003	12	17.9	2.045	0.465	0.1005	
480 minute winter	12	1.007	13	2.5	0.008	0.001	18.9565	
480 minute winter	13	1.008	14	1.8	0.099	0.025	0.4429	
480 minute winter	14	1.009	15	1.9	-0.005	0.001	12.6374	
480 minute winter	15	Hydro-Brake®	16	2.0				
360 minute summer	16	1.011	17	2.0	0.529	0.050	0.0133	
1440 minute winter	17	1.012	17_OUT	2.0	0.579	0.043	0.0584	195.1

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	64.830	0.057	10.7	0.0807	0.0000	OK
15 minute summer	2	12	63.931	0.379	51.6	0.8239	0.0000	SURCHARGED
15 minute summer	3	9	61.936	0.093	54.0	0.1252	0.0000	OK
15 minute summer	4	9	59.655	0.124	77.3	0.2139	0.0000	OK
15 minute summer	5	11	58.559	0.157	76.4	0.1776	0.0000	OK
720 minute winter	6	705	57.930	0.570	8.0	0.7849	0.0000	OK
720 minute winter	7	705	57.930	0.570	6.3	1.2053	0.0000	SURCHARGED
15 minute summer	8	10	61.271	0.071	11.8	0.1019	0.0000	OK
15 minute summer	9	10	60.784	0.053	11.7	0.0596	0.0000	OK
15 minute summer	10	10	59.808	0.085	32.9	0.1433	0.0000	OK
15 minute summer	11	10	58.137	0.120	32.8	0.1362	0.0000	OK
720 minute winter	12	705	57.930	0.570	3.9	0.6442	0.0000	OK
720 minute winter	13	705	57.930	0.570	2.7	0.6442	0.0000	SURCHARGED
720 minute winter	14	705	57.930	0.570	1.9	0.6441	0.0000	SURCHARGED
720 minute winter	15	705	57.930	0.570	2.9	1.3765	0.0000	FLOOD RISK
120 minute summer	16	714	57.300	0.036	2.0	0.0407	0.0000	OK
30 minute winter	17	242	57.275	0.032	2.0	0.0366	0.0000	OK
30 minute winter	17_OUT	242	57.142	0.032	2.0	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 summer	1	1.000	2	10.6	0.837	0.308	0.3904	
15 minute summer	2	1.001	3	45.4	2.697	1.017	0.4609	
15 minute summer	3	1.002	4	53.7	2.894	0.360	0.5376	
15 minute summer	4	1.003	5	76.4	2.946	0.545	0.4073	
15 minute summer	5	1.004	6	76.0	2.783	0.683	0.3429	
720 minute winter	6	1.005	7	3.0	0.012	0.001	157.2191	
720 minute winter	7	1.006	12	1.5	0.091	0.038	0.2789	
15 minute summer	8	2.000	9	11.7	1.720	0.390	0.1132	
15 minute summer	9	2.001	10	11.7	1.484	0.264	0.1302	
15 minute summer	10	2.002	11	32.8	2.574	0.609	0.2394	
15 minute summer	11	2.003	12	32.4	2.284	0.843	0.1630	
720 minute winter	12	1.007	13	2.7	0.005	0.001	38.9597	
720 minute winter	13	1.008	14	1.9	0.099	0.027	0.4586	
720 minute winter	14	1.009	15	1.9	-0.004	0.001	18.2509	
720 minute winter	15	Hydro-Brake®	16	2.0				
120 minute summer	16	1.011	17	2.0	0.529	0.050	0.0133	
30 minute winter	17	1.012	17_OUT	2.0	0.579	0.043	0.0584	118.9

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	64.838	0.065	13.4	0.0913	0.0000	OK
15 minute summer	2	12	64.545	0.993	64.7	2.1598	0.0000	SURCHARGED
15 minute summer	3	11	61.943	0.100	61.4	0.1347	0.0000	OK
15 minute summer	4	11	59.669	0.138	90.8	0.2391	0.0000	OK
15 minute summer	5	11	58.585	0.183	90.7	0.2072	0.0000	OK
960 minute winter	6	930	58.087	0.727	7.7	1.0023	0.0000	OK
960 minute winter	7	930	58.087	0.727	6.0	1.5392	0.0000	SURCHARGED
15 minute summer	8	10	61.281	0.081	14.8	0.1169	0.0000	OK
15 minute summer	9	10	60.790	0.059	14.7	0.0672	0.0000	OK
15 minute summer	10	10	59.821	0.098	41.3	0.1663	0.0000	OK
15 minute summer	11	11	58.353	0.336	41.1	0.3805	0.0000	SURCHARGED
960 minute winter	12	930	58.087	0.727	3.7	0.8226	0.0000	OK
960 minute winter	13	930	58.087	0.727	2.6	0.8226	0.0000	SURCHARGED
960 minute winter	14	930	58.087	0.727	1.9	0.8226	0.0000	SURCHARGED
960 minute winter	15	930	58.087	0.727	2.8	1.7578	0.0000	FLOOD RISK
120 minute summer	16	1132	57.300	0.036	2.0	0.0407	0.0000	OK
60 minute winter	17	936	57.275	0.032	2.0	0.0366	0.0000	OK
30 minute winter	17_OUT	519	57.142	0.032	2.0	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 summer	1	1.000	2	13.3	0.918	0.386	0.4085	
15 minute summer	2	1.001	3	51.8	2.941	1.158	0.4608	
15 minute summer	3	1.002	4	61.3	3.023	0.411	0.6059	
15 minute summer	4	1.003	5	90.7	2.992	0.647	0.4732	
15 minute summer	5	1.004	6	90.7	2.849	0.815	0.3983	
960 minute winter	6	1.005	7	2.8	0.012	0.001	200.7676	
960 minute winter	7	1.006	12	1.5	0.091	0.038	0.2789	
15 minute summer	8	2.000	9	14.7	1.816	0.489	0.1342	
15 minute summer	9	2.001	10	14.6	1.558	0.331	0.1547	
15 minute summer	10	2.002	11	41.1	2.610	0.763	0.2812	
15 minute summer	11	2.003	12	39.6	2.328	1.030	0.2021	
960 minute winter	12	1.007	13	2.6	0.007	0.001	49.7516	
960 minute winter	13	1.008	14	1.9	0.096	0.027	0.4586	
960 minute winter	14	1.009	15	1.9	-0.004	0.001	18.2509	
960 minute winter	15	Hydro-Brake®	16	2.0				
120 minute summer	16	1.011	17	2.0	0.529	0.050	0.0133	
60 minute winter	17	1.012	17_OUT	2.0	0.579	0.043	0.0584	191.7