

Design Settings

Rainfall Methodology	FEH-22	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)	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)	Depth (m)
S65	0.049	5.00	102.600	1200	1.200
S66LA	0.073	5.00	102.400	600	1.180
S66LB	0.033	5.00	102.400	600	1.195
S66	0.025	5.00	102.300	1200	1.200
S67	0.037	5.00	102.000	1200	1.200
S68L	0.054	5.00	101.300	600	0.829
S68	0.041	5.00	101.250	1350	1.200
S69L	0.075	5.00	101.150	600	0.886
S69	0.019	5.00	101.200	1350	1.343
S70L	0.135	5.00	101.400	600	1.085
S70	0.010	5.00	101.200	1350	1.375
S71	0.000		101.000	1350	1.249
S72L	0.066	5.00	100.800	600	0.804
S72	0.000		100.800	1350	1.205
S73L	0.043	5.00	100.800	600	0.733
S73	0.029	5.00	100.870	1200	1.200
S74LA	0.056	5.00	101.500	600	1.260
S74LB	0.035	5.00	101.500	600	1.259
S74	0.036	5.00	101.320	1200	1.200
S75	0.054	5.00	101.180	1350	1.762
S76L	0.082	5.00	100.700	600	0.750
S76	0.010	5.00	100.600	1500	1.389
S77			100.500	1500	1.325
Basin			100.014	10	1.000
S78++			100.450	1200	1.504
HW13			100.000	10	0.967

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	S65	S66	23.500	0.600	101.400	101.100	0.300	78.3	300	5.22	50.0
2.000	S66LA	S66	6.786	0.600	101.220	101.175	0.045	150.8	225	5.11	50.0
3.000	S66LB	S66	4.500	0.600	101.205	101.175	0.030	150.0	225	5.07	50.0
1.001	S66	S67	28.715	0.600	101.100	100.800	0.300	95.7	300	5.52	50.0
1.002	S67	S68	41.000	0.600	100.800	100.350	0.450	91.1	300	5.93	50.0
4.000	S68L	S68	6.959	0.600	100.471	100.425	0.046	151.3	225	5.11	50.0
1.003	S68	S69	43.500	0.600	100.050	99.857	0.193	225.4	600	6.38	49.2
5.000	S69L	S69	4.813	0.600	100.264	100.232	0.032	150.4	225	5.08	50.0
1.004	S69	S70	7.038	0.600	99.857	99.825	0.032	219.9	600	6.45	49.0
6.000	S70L	S70	17.195	0.600	100.315	100.200	0.115	149.5	225	5.27	50.0
1.005	S70	S71	16.718	0.600	99.825	99.751	0.074	225.9	600	6.63	48.4
1.006	S71	S72	35.113	0.600	99.751	99.595	0.156	225.1	600	6.99	47.1
7.000	S72L	S72	3.966	0.600	99.996	99.970	0.026	152.5	225	5.06	50.0
1.007	S72	S76	15.440	0.600	99.595	99.211	0.384	40.2	600	7.05	46.9
8.000	S73L	S73	3.322	0.600	100.067	100.045	0.022	151.0	225	5.05	50.0
8.001	S73	S75	22.851	0.600	99.670	99.418	0.252	90.7	600	5.20	50.0
10.000	S74LA	S74	6.775	0.600	100.240	100.195	0.045	150.6	225	5.11	50.0
9.000	S74LB	S74	6.954	0.600	100.241	100.195	0.046	151.2	225	5.11	50.0
9.001	S74	S75	12.257	0.600	100.120	99.718	0.402	30.5	300	5.18	50.0
8.002	S75	S76	46.577	0.600	99.418	99.211	0.207	225.0	600	5.68	50.0
11.000	S76L	S76	15.493	0.600	99.950	99.586	0.364	42.6	225	5.13	50.0
1.008	S76	S77	8.203	0.600	99.211	99.175	0.036	227.9	600	7.14	46.7
1.009	S77	Basin	13.690	0.600	99.175	99.014	0.161	85.0	600	7.22	46.4
1.010	Basin	S78++	4.061	0.600	99.014	98.946	0.068	59.7	450	7.25	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)
1.000	1.778	125.7	6.6	0.900	0.900	0.049	0.0	47	0.955
2.000	1.062	42.2	9.9	0.955	0.900	0.073	0.0	74	0.873
3.000	1.065	42.3	4.5	0.970	0.900	0.033	0.0	49	0.693
1.001	1.607	113.6	24.4	0.900	0.900	0.180	0.0	94	1.289
1.002	1.647	116.5	29.4	0.900	0.600	0.217	0.0	102	1.379
4.000	1.060	42.2	7.3	0.604	0.600	0.054	0.0	63	0.796
1.003	1.618	457.4	41.6	0.600	0.743	0.312	0.0	121	1.024
5.000	1.064	42.3	10.2	0.661	0.743	0.075	0.0	75	0.879
1.004	1.638	463.0	53.9	0.743	0.775	0.406	0.0	137	1.111
6.000	1.067	42.4	18.3	0.860	0.775	0.135	0.0	103	1.028
1.005	1.616	456.8	72.3	0.775	0.649	0.551	0.0	160	1.193
1.006	1.619	457.7	70.4	0.649	0.605	0.551	0.0	158	1.188
7.000	1.056	42.0	8.9	0.579	0.605	0.066	0.0	70	0.840
1.007	3.847	1087.8	78.5	0.605	0.789	0.617	0.0	108	2.282
8.000	1.061	42.2	5.8	0.508	0.600	0.043	0.0	57	0.753
8.001	2.558	723.2	9.8	0.600	1.162	0.072	0.0	48	0.924
10.000	1.063	42.3	7.6	1.035	0.900	0.056	0.0	65	0.811
9.000	1.061	42.2	4.7	1.034	0.900	0.035	0.0	51	0.704
9.001	2.857	202.0	17.2	0.900	1.162	0.127	0.0	59	1.768
8.002	1.619	457.8	34.3	1.162	0.789	0.253	0.0	110	0.969
11.000	2.010	79.9	11.1	0.525	0.789	0.082	0.0	57	1.429
1.008	1.609	454.9	121.6	0.789	0.725	0.962	0.0	211	1.371
1.009	2.642	746.9	121.0	0.725	0.400	0.962	0.0	162	1.968
1.010	2.634	418.9	120.8	0.550	1.054	0.962	0.0	165	2.291

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)
1.011	S78++	HW13	14.202	0.600	99.096	99.033	0.063	225.4	300	7.48	45.6

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)
1.011	1.043	73.7	118.9	1.054	0.667	0.962	0.0	300	1.056

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	23.500	78.3	300	Circular	102.600	101.400	0.900	102.300	101.100	0.900
2.000	6.786	150.8	225	Circular	102.400	101.220	0.955	102.300	101.175	0.900
3.000	4.500	150.0	225	Circular	102.400	101.205	0.970	102.300	101.175	0.900
1.001	28.715	95.7	300	Circular	102.300	101.100	0.900	102.000	100.800	0.900
1.002	41.000	91.1	300	Circular	102.000	100.800	0.900	101.250	100.350	0.600
4.000	6.959	151.3	225	Circular	101.300	100.471	0.604	101.250	100.425	0.600
1.003	43.500	225.4	600	Circular	101.250	100.050	0.600	101.200	99.857	0.743
5.000	4.813	150.4	225	Circular	101.150	100.264	0.661	101.200	100.232	0.743
1.004	7.038	219.9	600	Circular	101.200	99.857	0.743	101.200	99.825	0.775
6.000	17.195	149.5	225	Circular	101.400	100.315	0.860	101.200	100.200	0.775
1.005	16.718	225.9	600	Circular	101.200	99.825	0.775	101.000	99.751	0.649
1.006	35.113	225.1	600	Circular	101.000	99.751	0.649	100.800	99.595	0.605
7.000	3.966	152.5	225	Circular	100.800	99.996	0.579	100.800	99.970	0.605
1.007	15.440	40.2	600	Circular	100.800	99.595	0.605	100.600	99.211	0.789
8.000	3.322	151.0	225	Circular	100.800	100.067	0.508	100.870	100.045	0.600
8.001	22.851	90.7	600	Circular	100.870	99.670	0.600	101.180	99.418	1.162
10.000	6.775	150.6	225	Circular	101.500	100.240	1.035	101.320	100.195	0.900
9.000	6.954	151.2	225	Circular	101.500	100.241	1.034	101.320	100.195	0.900
9.001	12.257	30.5	300	Circular	101.320	100.120	0.900	101.180	99.718	1.162

Link	US Node	Dia (mm)	Node Type	DS Node	Dia (mm)	Node Type
1.000	S65	1200	Manhole	S66	1200	Manhole
2.000	S66LA	600	Manhole	S66	1200	Manhole
3.000	S66LB	600	Manhole	S66	1200	Manhole
1.001	S66	1200	Manhole	S67	1200	Manhole
1.002	S67	1200	Manhole	S68	1350	Manhole
4.000	S68L	600	Manhole	S68	1350	Manhole
1.003	S68	1350	Manhole	S69	1350	Manhole
5.000	S69L	600	Manhole	S69	1350	Manhole
1.004	S69	1350	Manhole	S70	1350	Manhole
6.000	S70L	600	Manhole	S70	1350	Manhole
1.005	S70	1350	Manhole	S71	1350	Manhole
1.006	S71	1350	Manhole	S72	1350	Manhole
7.000	S72L	600	Manhole	S72	1350	Manhole
1.007	S72	1350	Manhole	S76	1500	Manhole
8.000	S73L	600	Manhole	S73	1200	Manhole
8.001	S73	1200	Manhole	S75	1350	Manhole
10.000	S74LA	600	Manhole	S74	1200	Manhole
9.000	S74LB	600	Manhole	S74	1200	Manhole
9.001	S74	1200	Manhole	S75	1350	Manhole

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)
8.002	46.577	225.0	600	Circular	101.180	99.418	1.162	100.600	99.211	0.789
11.000	15.493	42.6	225	Circular	100.700	99.950	0.525	100.600	99.586	0.789
1.008	8.203	227.9	600	Circular	100.600	99.211	0.789	100.500	99.175	0.725
1.009	13.690	85.0	600	Circular	100.500	99.175	0.725	100.014	99.014	0.400
1.010	4.061	59.7	450	Circular	100.014	99.014	0.550	100.450	98.946	1.054
1.011	14.202	225.4	300	Circular	100.450	99.096	1.054	100.000	99.033	0.667

Link	US Node	Dia (mm)	Node Type	DS Node	Dia (mm)	Node Type
8.002	S75	1350	Manhole	S76	1500	Manhole
11.000	S76L	600	Manhole	S76	1500	Manhole
1.008	S76	1500	Manhole	S77	1500	Manhole
1.009	S77	1500	Manhole	Basin	10	Manhole
1.010	Basin	10	Manhole	S78++	1200	Manhole
1.011	S78++	1200	Manhole	HW13	10	Manhole

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	MH Type	Connections	Link	IL (m)	Dia (mm)
S65	102.600	1.200	1200	Adoptable				
					0	1.000	101.400	300
S66LA	102.400	1.180	600	Adoptable				
					0	2.000	101.220	225
S66LB	102.400	1.195	600	Adoptable				
					0	3.000	101.205	225
S66	102.300	1.200	1200	Adoptable				
					1	3.000	101.175	225
					2	2.000	101.175	225
					3	1.000	101.100	300
					0	1.001	101.100	300
S67	102.000	1.200	1200	Adoptable				
					1	1.001	100.800	300
					0	1.002	100.800	300
S68L	101.300	0.829	600	Adoptable				
					0	4.000	100.471	225
S68	101.250	1.200	1350	Adoptable				
					1	4.000	100.425	225
					2	1.002	100.350	300
					0	1.003	100.050	600
S69L	101.150	0.886	600	Adoptable				
					0	5.000	100.264	225

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	MH Type	Connections		Link	IL (m)	Dia (mm)
S69	101.200	1.343	1350	Adoptable		1	5.000	100.232	225
						2	1.003	99.857	600
						0	1.004	99.857	600
S70L	101.400	1.085	600	Adoptable		0	6.000	100.315	225
S70	101.200	1.375	1350	Adoptable		1	6.000	100.200	225
						2	1.004	99.825	600
						0	1.005	99.825	600
S71	101.000	1.249	1350	Adoptable		1	1.005	99.751	600
						0	1.006	99.751	600
S72L	100.800	0.804	600	Adoptable		0	7.000	99.996	225
S72	100.800	1.205	1350	Adoptable		1	7.000	99.970	225
						2	1.006	99.595	600
						0	1.007	99.595	600
S73L	100.800	0.733	600	Adoptable		0	8.000	100.067	225
						1	8.000	100.045	225
S73	100.870	1.200	1200	Adoptable		0	8.001	99.670	600
S74LA	101.500	1.260	600	Adoptable		0	10.000	100.240	225
S74LB	101.500	1.259	600	Adoptable		0	9.000	100.241	225
S74	101.320	1.200	1200	Adoptable		1	10.000	100.195	225
						2	9.000	100.195	225
						0	9.001	100.120	300
S75	101.180	1.762	1350	Adoptable		1	9.001	99.718	300
						2	8.001	99.418	600
						0	8.002	99.418	600
S76L	100.700	0.750	600	Adoptable		0	11.000	99.950	225

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	MH Type	Connections	Link	IL (m)	Dia (mm)	
S76	100.600	1.389	1500	Adoptable		1	11.000	99.586	225
						2	8.002	99.211	600
						3	1.007	99.211	600
						0	1.008	99.211	600
S77	100.500	1.325	1500	Adoptable		1	1.008	99.175	600
						0	1.009	99.175	600
Basin	100.014	1.000	10	Adoptable		1	1.009	99.014	600
						0	1.010	99.014	450
S78++	100.450	1.504	1200	Adoptable		1	1.010	98.946	450
						0	1.011	99.096	300
HW13	100.000	0.967	10	Adoptable		1	1.011	99.033	300

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/ha)	10.0		

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 %)
100	40	0	0

Node S78++ Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	99.096	Product Number	CTL-SHE-0103-5000-1200-5000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node Basin Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	99.014
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	850.0	0.0	1.000	1515.0	0.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S65	11	101.558	0.157	29.0	0.2424	0.0000	OK
15 minute winter	S66LA	11	101.609	0.388	43.1	0.3500	0.0000	SURCHARGED
15 minute winter	S66LB	11	101.548	0.343	19.5	0.1917	0.0000	SURCHARGED
15 minute winter	S66	11	101.538	0.438	100.8	0.5864	0.0000	SURCHARGED
15 minute winter	S67	11	101.286	0.486	121.3	0.6994	0.0000	SURCHARGED
15 minute winter	S68L	10	100.888	0.417	31.9	0.3898	0.0000	SURCHARGED
15 minute summer	S68	10	100.896	0.846	163.5	1.5003	0.0000	SURCHARGED
15 minute winter	S69L	10	100.891	0.627	44.3	0.7076	0.0000	FLOOD RISK
15 minute winter	S69	10	100.804	0.947	260.4	1.4893	0.0000	SURCHARGED
15 minute winter	S70L	10	101.223	0.908	79.8	1.3870	0.0000	FLOOD RISK
15 minute winter	S70	10	100.786	0.961	359.2	1.4451	0.0000	SURCHARGED
15 minute winter	S71	10	100.733	0.982	364.9	1.4046	0.0000	FLOOD RISK
15 minute winter	S72L	10	100.660	0.664	39.0	0.7331	0.0000	FLOOD RISK
15 minute winter	S72	10	100.626	1.031	408.3	1.4750	0.0000	FLOOD RISK
15 minute winter	S73L	10	100.518	0.451	25.5	0.3918	0.0000	FLOOD RISK
15 minute winter	S73	10	100.510	0.839	114.2	1.1526	0.0000	SURCHARGED
15 minute winter	S74LA	10	100.628	0.388	33.1	0.2823	0.0000	SURCHARGED
15 minute winter	S74LB	10	100.602	0.361	20.7	0.2023	0.0000	SURCHARGED
15 minute winter	S74	10	100.587	0.467	82.2	0.6681	0.0000	SURCHARGED
15 minute winter	S75	10	100.520	1.102	172.8	1.9146	0.0000	SURCHARGED
15 minute winter	S76L	10	100.652	0.702	48.4	0.9658	0.0000	FLOOD RISK
15 minute winter	S76	10	100.538	1.327	650.0	2.4398	0.0000	FLOOD RISK
15 minute winter	S77	10	100.408	1.233	655.5	2.1789	0.0000	FLOOD RISK
720 minute winter	Basin	705	99.617	0.603	44.4	633.8959	0.0000	SURCHARGED
720 minute winter	S78++	705	99.617	0.671	5.2	0.7593	0.0000	SURCHARGED

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	S65	1.000	S66	32.2	0.688	0.256	1.2675	
15 minute winter	S66LA	2.000	S66	41.4	1.140	0.981	0.2699	
15 minute winter	S66LB	3.000	S66	18.7	0.796	0.443	0.1790	
15 minute winter	S66	1.001	S67	104.2	1.565	0.917	2.0221	
15 minute winter	S67	1.002	S68	124.5	1.797	1.070	2.8872	
15 minute winter	S68L	4.000	S68	33.0	1.093	0.781	0.2768	
15 minute summer	S68	1.003	S69	202.7	0.988	0.443	12.2530	
15 minute winter	S69L	5.000	S69	52.5	1.321	1.242	0.1914	
15 minute winter	S69	1.004	S70	281.5	1.099	0.608	1.9824	
15 minute winter	S70L	6.000	S70	79.7	2.005	1.880	0.6839	
15 minute winter	S70	1.005	S71	364.9	1.511	0.799	4.7091	
15 minute winter	S71	1.006	S72	374.3	2.033	0.818	9.8905	
15 minute winter	S72L	7.000	S72	43.9	1.104	1.046	0.1577	
15 minute winter	S72	1.007	S76	435.2	1.677	0.400	4.3491	
15 minute winter	S73L	8.000	S73	29.2	1.023	0.693	0.1321	
15 minute winter	S73	8.001	S75	-81.6	0.495	-0.113	6.4366	
15 minute winter	S74LA	10.000	S74	36.9	1.073	0.873	0.2694	
15 minute winter	S74LB	9.000	S74	25.1	0.974	0.595	0.2766	
15 minute winter	S74	9.001	S75	90.0	2.013	0.446	0.8631	
15 minute winter	S75	8.002	S76	186.2	0.683	0.407	13.1197	
15 minute winter	S76L	11.000	S76	52.4	1.565	0.655	0.6162	
15 minute winter	S76	1.008	S77	655.5	2.328	1.441	2.3106	
15 minute winter	S77	1.009	Basin	668.1	3.770	0.895	2.2219	
720 minute winter	Basin	1.010	S78++	5.2	0.062	0.012	0.6434	
720 minute winter	S78++	1.011	HW13	5.0	0.592	0.068	0.1200	201.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	HW13	122	99.085	0.052	5.0	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)
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