

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	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	✓
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)
200	0.049	5.00	53.204	1200	477190.921	165393.656	1.451
201	0.042	5.00	53.115	1200	477166.998	165378.309	1.480
210	0.096	5.00	52.855	1200	477142.070	165371.987	1.288
202	0.043	5.00	52.829	1200	477146.464	165365.137	1.296
203	0.035	5.00	52.692	1200	477129.730	165354.402	1.242
204			52.550	1200	477134.028	165348.217	1.150
205			52.550	1200	477136.459	165344.720	1.200
220	0.100	5.00	53.166	1200	477102.660	165337.036	1.500
221			52.880	1200	477115.350	165345.177	1.430
222			52.550	1200	477119.710	165338.758	1.150
223			52.550	1200	477122.014	165335.368	1.200
206			52.550	1	477139.307	165336.972	1.300
207			52.550	2100	477142.468	165333.471	1.500
208			52.000	1	477145.394	165328.656	1.050

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	200	201	28.423	0.600	51.753	51.635	0.118	240.0	300	5.47	50.0
1.001	201	202	24.396	0.600	51.635	51.533	0.102	240.0	300	5.87	50.0
2.000	210	202	8.138	0.600	51.567	51.533	0.034	240.0	300	5.13	50.0
1.002	202	203	19.881	0.600	51.533	51.450	0.083	240.0	300	6.20	50.0
1.003	203	204	11.791	0.600	51.450	51.400	0.050	235.8	300	6.39	50.0
1.004	204	205	4.259	0.600	51.400	51.350	0.050	85.2	300	6.43	50.0
1.005	205	206	5.000	0.600	51.350	51.250	0.100	50.0	300	6.47	50.0
3.000	220	221	15.077	0.600	51.666	51.450	0.216	69.8	300	5.13	50.0
3.001	221	222	7.760	0.600	51.450	51.400	0.050	155.2	300	5.24	50.0

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)
1.000	1.010	71.4	8.9	1.151	1.180	0.049	0.0	71	0.695
1.001	1.010	71.4	16.4	1.180	0.996	0.091	0.0	98	0.825
2.000	1.010	71.4	17.3	0.988	0.996	0.096	0.0	100	0.838
1.002	1.010	71.4	41.6	0.996	0.942	0.230	0.0	164	1.047
1.003	1.019	72.0	47.9	0.942	0.850	0.265	0.0	179	1.088
1.004	1.704	120.5	47.9	0.850	0.900	0.265	0.0	132	1.611
1.005	2.228	157.5	47.9	0.900	1.000	0.265	0.0	113	1.965
3.000	1.884	133.2	18.1	1.200	1.130	0.100	0.0	74	1.328
3.001	1.259	89.0	18.1	1.130	0.850	0.100	0.0	91	0.992

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)
3.002	222	223	4.099	0.600	51.400	51.350	0.050	82.0	300	5.28	50.0
3.003	223	206	5.000	0.600	51.350	51.250	0.100	50.0	300	5.31	50.0
1.006	206	207	4.717	0.600	51.250	51.050	0.200	23.6	300	6.50	50.0
1.007	207	208	5.634	0.600	51.050	50.950	0.100	56.3	300	6.54	50.0

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)
3.002	1.737	122.8	18.1	0.850	0.900	0.100	0.0	77	1.251
3.003	2.228	157.5	18.1	0.900	1.000	0.100	0.0	68	1.500
1.006	3.251	229.8	66.0	1.000	1.200	0.365	0.0	110	2.823
1.007	2.098	148.3	66.0	1.200	0.750	0.365	0.0	140	2.037

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	28.423	240.0	300	Circular_Default Sewer Type	53.204	51.753	1.151	53.115	51.635	1.180
1.001	24.396	240.0	300	Circular_Default Sewer Type	53.115	51.635	1.180	52.829	51.533	0.996
2.000	8.138	240.0	300	Circular_Default Sewer Type	52.855	51.567	0.988	52.829	51.533	0.996
1.002	19.881	240.0	300	Circular_Default Sewer Type	52.829	51.533	0.996	52.692	51.450	0.942
1.003	11.791	235.8	300	Circular_Default Sewer Type	52.692	51.450	0.942	52.550	51.400	0.850
1.004	4.259	85.2	300	Circular_Default Sewer Type	52.550	51.400	0.850	52.550	51.350	0.900
1.005	5.000	50.0	300	Circular_Default Sewer Type	52.550	51.350	0.900	52.550	51.250	1.000
3.000	15.077	69.8	300	Circular_Default Sewer Type	53.166	51.666	1.200	52.880	51.450	1.130
3.001	7.760	155.2	300	Circular_Default Sewer Type	52.880	51.450	1.130	52.550	51.400	0.850
3.002	4.099	82.0	300	Circular_Default Sewer Type	52.550	51.400	0.850	52.550	51.350	0.900
3.003	5.000	50.0	300	Circular_Default Sewer Type	52.550	51.350	0.900	52.550	51.250	1.000
1.006	4.717	23.6	300	Circular_Default Sewer Type	52.550	51.250	1.000	52.550	51.050	1.200
1.007	5.634	56.3	300	Circular_Default Sewer Type	52.550	51.050	1.200	52.000	50.950	0.750

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	200	1200	Manhole	Adoptable	201	1200	Manhole	Adoptable
1.001	201	1200	Manhole	Adoptable	202	1200	Manhole	Adoptable
2.000	210	1200	Manhole	Adoptable	202	1200	Manhole	Adoptable
1.002	202	1200	Manhole	Adoptable	203	1200	Manhole	Adoptable
1.003	203	1200	Manhole	Adoptable	204	1200	Manhole	Adoptable
1.004	204	1200	Manhole	Adoptable	205	1200	Manhole	Adoptable
1.005	205	1200	Manhole	Adoptable	206	1	Manhole	Adoptable
3.000	220	1200	Manhole	Adoptable	221	1200	Manhole	Adoptable
3.001	221	1200	Manhole	Adoptable	222	1200	Manhole	Adoptable
3.002	222	1200	Manhole	Adoptable	223	1200	Manhole	Adoptable
3.003	223	1200	Manhole	Adoptable	206	1	Manhole	Adoptable
1.006	206	1	Manhole	Adoptable	207	2100	Manhole	Adoptable
1.007	207	2100	Manhole	Adoptable	208	1	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	✓	Check Discharge Rate(s)	✓
Rainfall Events	Singular	Drain Down Time (mins)	240	Check Discharge Volume	✓
Winter CV	1.000	Additional Storage (m³/ha)	20.0	100 year 360 minute (m³)	
Analysis Speed	Normal	Starting Level (m)			

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 %)
2	0	6	0
10	0	6	0
30	40	6	0
100	40	6	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		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m³)	

Node 207 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	51.050	Product Number	CTL-SHE-0142-9700-1100-9700
Design Depth (m)	1.100	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	9.7	Min Node Diameter (mm)	1200

Node 206 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	51.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	184

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	124.0	0.0	1.300	440.0	0.0

Results for 2 year +6% A Critical Storm Duration. Lowest mass balance: 99.12%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	200	10	51.821	0.068	8.5	0.1262	0.0000	OK
15 minute winter	201	11	51.728	0.093	15.5	0.1606	0.0000	OK
15 minute winter	210	11	51.709	0.142	16.6	0.3843	0.0000	OK
15 minute winter	202	11	51.703	0.170	38.1	0.3114	0.0000	OK
15 minute winter	203	11	51.627	0.177	43.8	0.3053	0.0000	OK
15 minute winter	204	11	51.551	0.151	43.8	0.1704	0.0000	OK
15 minute winter	205	11	51.480	0.130	43.7	0.1473	0.0000	OK
15 minute winter	220	10	51.740	0.074	17.3	0.1890	0.0000	OK
15 minute winter	221	10	51.546	0.096	17.1	0.1082	0.0000	OK
15 minute winter	222	10	51.485	0.085	16.9	0.0966	0.0000	OK
120 minute winter	223	86	51.431	0.081	6.3	0.0913	0.0000	OK
120 minute winter	206	86	51.413	0.163	42.7	23.4897	0.0000	OK
30 minute winter	207	25	51.444	0.394	43.9	1.3654	0.0000	SURCHARGED
15 minute winter	208	1	50.950	0.000	9.7	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	200	1.000	201	8.3	0.551	0.116	0.4319	
15 minute winter	201	1.001	202	15.2	0.514	0.212	0.7269	
15 minute winter	210	2.000	202	15.9	0.468	0.222	0.3005	
15 minute winter	202	1.002	203	38.1	0.903	0.533	0.8377	
15 minute winter	203	1.003	204	43.8	1.114	0.608	0.4632	
15 minute winter	204	1.004	205	43.7	1.354	0.363	0.1379	
15 minute winter	205	1.005	206	43.8	2.152	0.278	0.1261	
15 minute winter	220	3.000	221	17.1	1.044	0.128	0.2479	
15 minute winter	221	3.001	222	16.9	0.942	0.189	0.1390	
15 minute winter	222	3.002	223	16.8	1.119	0.137	0.0618	
120 minute winter	223	3.003	206	8.9	0.980	0.057	0.1361	
120 minute winter	206	1.006	207	42.3	0.809	0.184	0.2585	
30 minute winter	207	Hydro-Brake®	208	9.7				37.0

Results for 10 year +6% A Critical Storm Duration. Lowest mass balance: 99.12%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	200	12	51.900	0.147	18.4	0.2724	0.0000	OK
15 minute winter	201	12	51.895	0.260	33.8	0.4510	0.0000	OK
15 minute winter	210	11	51.889	0.322	36.1	0.8736	0.0000	SURCHARGED
15 minute winter	202	11	51.876	0.343	73.6	0.6282	0.0000	SURCHARGED
15 minute winter	203	11	51.760	0.309	85.7	0.5348	0.0000	SURCHARGED
120 minute winter	204	98	51.640	0.240	31.8	0.2712	0.0000	OK
120 minute winter	205	96	51.639	0.289	31.6	0.3273	0.0000	OK
15 minute winter	220	10	51.783	0.117	37.6	0.2970	0.0000	OK
120 minute winter	221	100	51.640	0.190	12.1	0.2154	0.0000	OK
120 minute winter	222	98	51.644	0.244	13.3	0.2757	0.0000	OK
120 minute winter	223	104	51.638	0.288	21.5	0.3257	0.0000	OK
120 minute winter	206	98	51.639	0.389	53.4	66.6387	0.0000	SURCHARGED
120 minute winter	207	96	51.638	0.588	27.9	2.0380	0.0000	SURCHARGED
15 minute winter	208	1	50.950	0.000	9.7	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	200	1.000	201	18.0	0.624	0.252	1.4121	
15 minute winter	201	1.001	202	32.6	0.530	0.456	1.6508	
15 minute winter	210	2.000	202	33.8	0.504	0.474	0.5731	
15 minute winter	202	1.002	203	73.8	1.048	1.033	1.4000	
15 minute winter	203	1.003	204	85.6	1.272	1.188	0.7706	
120 minute winter	204	1.004	205	31.6	1.196	0.262	0.2769	
120 minute winter	205	1.005	206	31.4	1.424	0.199	0.3502	
15 minute winter	220	3.000	221	37.3	1.229	0.280	0.4575	
120 minute winter	221	3.001	222	12.2	0.861	0.137	0.4184	
120 minute winter	222	3.002	223	20.9	1.078	0.170	0.2673	
120 minute winter	223	3.003	206	22.0	1.092	0.140	0.3501	
120 minute winter	206	1.006	207	27.9	0.767	0.121	0.3322	
120 minute winter	207	Hydro-Brake®	208	9.7				127.3

Results for 30 year +40% CC +6% A Critical Storm Duration. Lowest mass balance: 99.12%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	200	12	52.842	1.089	34.4	2.0120	0.0000	SURCHARGED
15 minute winter	201	12	52.820	1.184	55.5	2.0527	0.0000	FLOOD RISK
15 minute winter	210	12	52.783	1.216	67.4	3.2976	0.0000	FLOOD RISK
15 minute winter	202	12	52.748	1.215	137.1	2.2283	0.0000	FLOOD RISK
15 minute winter	203	12	52.364	0.914	156.0	1.5794	0.0000	SURCHARGED
15 minute winter	204	12	52.016	0.616	153.3	0.6968	0.0000	SURCHARGED
120 minute winter	205	118	51.983	0.633	51.7	0.7162	0.0000	SURCHARGED
120 minute winter	220	118	51.983	0.317	22.3	0.8074	0.0000	SURCHARGED
120 minute winter	221	118	51.983	0.533	22.3	0.6027	0.0000	SURCHARGED
120 minute winter	222	118	51.983	0.583	21.3	0.6599	0.0000	SURCHARGED
120 minute winter	223	116	51.983	0.633	20.9	0.7155	0.0000	SURCHARGED
120 minute winter	206	118	51.983	0.733	71.5	156.1179	0.0000	SURCHARGED
120 minute winter	207	118	51.982	0.932	44.2	3.2285	0.0000	SURCHARGED
15 minute winter	208	1	50.950	0.000	9.7	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	200	1.000	201	28.5	0.629	0.399	2.0015	
15 minute winter	201	1.001	202	52.9	0.752	0.741	1.7179	
15 minute winter	210	2.000	202	57.2	0.813	0.801	0.5731	
15 minute winter	202	1.002	203	132.9	1.888	1.861	1.4000	
15 minute winter	203	1.003	204	153.3	2.177	2.128	0.8303	
15 minute winter	204	1.004	205	152.1	2.161	1.263	0.2999	
120 minute winter	205	1.005	206	51.4	1.615	0.326	0.3521	
120 minute winter	220	3.000	221	22.3	1.013	0.167	1.0617	
120 minute winter	221	3.001	222	21.3	0.893	0.239	0.5465	
120 minute winter	222	3.002	223	20.9	1.091	0.170	0.2886	
120 minute winter	223	3.003	206	20.6	1.251	0.131	0.3521	
120 minute winter	206	1.006	207	44.2	0.843	0.192	0.3322	
120 minute winter	207	Hydro-Brake®	208	9.7				181.9

Results for 100 year +40% CC +6% A Critical Storm Duration. Lowest mass balance: 99.12%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	200	10	53.083	1.330	44.4	2.4558	0.0000	FLOOD RISK
15 minute winter	201	10	53.011	1.376	82.5	2.3854	0.0000	FLOOD RISK
15 minute winter	210	10	52.855	1.288	87.0	3.4918	5.7786	FLOOD
15 minute winter	202	10	52.829	1.296	165.5	2.3769	4.6089	FLOOD
30 minute winter	203	20	52.481	1.031	155.1	1.7808	0.0000	FLOOD RISK
30 minute winter	204	21	52.177	0.777	154.6	0.8789	0.0000	SURCHARGED
120 minute winter	205	118	52.163	0.813	70.6	0.9190	0.0000	SURCHARGED
120 minute winter	220	118	52.161	0.495	28.4	1.2605	0.0000	SURCHARGED
120 minute winter	221	120	52.162	0.712	27.7	0.8053	0.0000	SURCHARGED
120 minute winter	222	120	52.163	0.763	26.8	0.8633	0.0000	SURCHARGED
120 minute winter	223	120	52.164	0.814	26.7	0.9203	0.0000	SURCHARGED
120 minute winter	206	120	52.161	0.911	96.2	213.8779	0.0000	SURCHARGED
120 minute winter	207	120	52.160	1.110	34.5	3.8461	0.0000	SURCHARGED
15 minute winter	208	1	50.950	0.000	9.7	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	200	1.000	201	44.5	0.633	0.624	2.0015	
15 minute winter	201	1.001	202	79.4	1.127	1.112	1.7179	
15 minute winter	210	2.000	202	62.4	0.886	0.874	0.5731	
15 minute winter	202	1.002	203	133.7	1.898	1.872	1.4000	
30 minute winter	203	1.003	204	154.6	2.196	2.146	0.8303	
30 minute winter	204	1.004	205	153.9	2.186	1.278	0.2999	
120 minute winter	205	1.005	206	70.8	1.665	0.449	0.3521	
120 minute winter	220	3.000	221	27.7	1.014	0.208	1.0617	
120 minute winter	221	3.001	222	26.8	0.879	0.302	0.5465	
120 minute winter	222	3.002	223	26.7	1.087	0.218	0.2886	
120 minute winter	223	3.003	206	26.0	1.289	0.165	0.3521	
120 minute winter	206	1.006	207	34.5	0.900	0.150	0.3322	
120 minute winter	207	Hydro-Brake®	208	9.7				187.9