

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	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)
RE10	0.100	5.00	4.200	600	561343.642	175223.270	1.650
Ex. SMH1	0.050	5.00	4.140	1050	561429.291	175118.136	2.132
S10	0.100	5.00	4.140	1050	561437.856	175107.980	2.185
S20	0.090	5.00	4.100	1050	561462.013	175130.379	2.277
Ex. SMH2	0.050	5.00	4.100	1200	561458.359	175136.330	2.305
Ex. SMH3	0.110	5.00	3.960	1200	561412.113	175190.487	2.450
SW-FCC	0.220	5.00	4.100	1800	561369.265	175241.618	2.781
Ex. SW Outfall MH			4.100	1200	561360.953	175258.843	2.868

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	RE10	Ex. SMH1	135.606	0.600	2.550	2.008	0.542	250.0	450	6.76	47.8
1.001	Ex. SMH1	S10	13.285	0.600	2.008	1.955	0.053	250.0	450	6.94	47.2
1.002	S10	S20	32.944	0.600	1.955	1.823	0.132	250.0	450	7.37	45.8
1.003	S20	Ex. SMH2	6.983	0.600	1.823	1.795	0.028	250.0	450	7.46	45.5
1.004	Ex. SMH2	Ex. SMH3	71.216	0.600	1.795	1.510	0.285	250.0	450	8.38	42.7
1.005	Ex. SMH3	SW-FCC	66.711	0.600	1.510	1.319	0.191	350.0	450	9.41	40.1
1.006	SW-FCC	Ex. SW Outfall MH	19.126	0.600	1.319	1.232	0.087	220.0	450	9.65	39.5

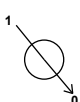
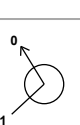
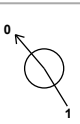
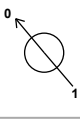
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.281	203.7	17.3	1.200	1.682	0.100	0.0	87	0.790
1.001	1.281	203.7	25.6	1.682	1.735	0.150	0.0	107	0.885
1.002	1.281	203.7	41.3	1.735	1.827	0.250	0.0	137	1.012
1.003	1.281	203.7	55.9	1.827	1.855	0.340	0.0	160	1.099
1.004	1.281	203.7	60.2	1.855	2.000	0.390	0.0	167	1.122
1.005	1.081	171.9	72.4	2.000	2.331	0.500	0.0	203	1.036
1.006	1.366	217.3	102.8	2.331	2.418	0.720	0.0	218	1.348

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	135.606	250.0	450	Circular	4.200	2.550	1.200	4.140	2.008	1.682
1.001	13.285	250.0	450	Circular	4.140	2.008	1.682	4.140	1.955	1.735
1.002	32.944	250.0	450	Circular	4.140	1.955	1.735	4.100	1.823	1.827
1.003	6.983	250.0	450	Circular	4.100	1.823	1.827	4.100	1.795	1.855
1.004	71.216	250.0	450	Circular	4.100	1.795	1.855	3.960	1.510	2.000
1.005	66.711	350.0	450	Circular	3.960	1.510	2.000	4.100	1.319	2.331
1.006	19.126	220.0	450	Circular	4.100	1.319	2.331	4.100	1.232	2.418

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	RE10	600	Manhole	Adoptable	Ex. SMH1	1050	Manhole	Adoptable
1.001	Ex. SMH1	1050	Manhole	Adoptable	S10	1050	Manhole	Adoptable
1.002	S10	1050	Manhole	Adoptable	S20	1050	Manhole	Adoptable
1.003	S20	1050	Manhole	Adoptable	Ex. SMH2	1200	Manhole	Adoptable
1.004	Ex. SMH2	1200	Manhole	Adoptable	Ex. SMH3	1200	Manhole	Adoptable
1.005	Ex. SMH3	1200	Manhole	Adoptable	SW-FCC	1800	Manhole	Adoptable
1.006	SW-FCC	1800	Manhole	Adoptable	Ex. SW Outfall MH	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
RE10	561343.642	175223.270	4.200	1.650	600				
						0	1.000	2.550	450
Ex. SMH1	561429.291	175118.136	4.140	2.132	1050				
						0	1.001	2.008	450
S10	561437.856	175107.980	4.140	2.185	1050				
						0	1.002	1.955	450
S20	561462.013	175130.379	4.100	2.277	1050				
						0	1.003	1.823	450
Ex. SMH2	561458.359	175136.330	4.100	2.305	1200				
						0	1.004	1.795	450
Ex. SMH3	561412.113	175190.487	3.960	2.450	1200				
						0	1.005	1.510	450
SW-FCC	561369.265	175241.618	4.100	2.781	1800				
						0	1.006	1.319	450

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Ex. SW Outfall MH	561360.953	175258.843	4.100	2.868	1200	1	1.006	1.232	450



Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	1 year (l/s)	1.3
Summer CV	1.000	Drain Down Time (mins)	240	30 year (l/s)	3.7
Winter CV	1.000	Additional Storage (m³/ha)	20.0	100 year (l/s)	5.0
Analysis Speed	Normal	Check Discharge Rate(s)	✓	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	35	0	0
100	20	0	0
100	40	0	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)	0.720	Betterment (%)	0
SAAR (mm)	549	QBar	1.6
Soil Index	3	Q 1 year (l/s)	
SPR	0.37	Q 30 year (l/s)	
Region	7	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Node SW-FCC Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	1.319	Product Number	CTL-SHE-0200-1980-0800-1980
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	19.8	Min Node Diameter (mm)	1500

Node SW-FCC Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.319
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	168

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	175.0	0.0	1.600	175.0	0.0	1.601	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	107.434	30.400	100 year +20% CC 15 minute summer	446.610	126.375
2 year 15 minute winter	75.392	30.400	100 year +20% CC 15 minute winter	313.411	126.375
2 year 30 minute summer	68.244	19.311	100 year +20% CC 30 minute summer	289.629	81.955
2 year 30 minute winter	47.891	19.311	100 year +20% CC 30 minute winter	203.249	81.955
2 year 60 minute summer	44.651	11.800	100 year +20% CC 60 minute summer	191.773	50.680
2 year 60 minute winter	29.665	11.800	100 year +20% CC 60 minute winter	127.409	50.680
2 year 120 minute summer	30.830	8.147	100 year +20% CC 120 minute summer	114.935	30.374
2 year 120 minute winter	20.483	8.147	100 year +20% CC 120 minute winter	76.360	30.374
2 year 180 minute summer	24.616	6.335	100 year +20% CC 180 minute summer	87.503	22.517
2 year 180 minute winter	16.001	6.335	100 year +20% CC 180 minute winter	56.879	22.517
2 year 240 minute summer	19.785	5.229	100 year +20% CC 240 minute summer	68.928	18.216
2 year 240 minute winter	13.145	5.229	100 year +20% CC 240 minute winter	45.794	18.216
2 year 360 minute summer	15.230	3.919	100 year +20% CC 360 minute summer	52.541	13.521
2 year 360 minute winter	9.900	3.919	100 year +20% CC 360 minute winter	34.153	13.521
2 year 480 minute summer	11.954	3.159	100 year +20% CC 480 minute summer	41.434	10.950
2 year 480 minute winter	7.942	3.159	100 year +20% CC 480 minute winter	27.528	10.950
2 year 600 minute summer	9.724	2.660	100 year +20% CC 600 minute summer	33.951	9.286
2 year 600 minute winter	6.644	2.660	100 year +20% CC 600 minute winter	23.198	9.286
2 year 720 minute summer	8.600	2.305	100 year +20% CC 720 minute summer	30.251	8.108
2 year 720 minute winter	5.780	2.305	100 year +20% CC 720 minute winter	20.331	8.108
2 year 960 minute summer	6.950	1.830	100 year +20% CC 960 minute summer	24.766	6.522
2 year 960 minute winter	4.603	1.830	100 year +20% CC 960 minute winter	16.406	6.522
2 year 1440 minute summer	4.938	1.323	100 year +20% CC 1440 minute summer	17.720	4.749
2 year 1440 minute winter	3.319	1.323	100 year +20% CC 1440 minute winter	11.909	4.749
30 year +35% CC 15 minute summer	392.008	110.925	100 year +40% CC 15 minute summer	521.045	147.438
30 year +35% CC 15 minute winter	275.093	110.925	100 year +40% CC 15 minute winter	365.646	147.438
30 year +35% CC 30 minute summer	251.842	71.263	100 year +40% CC 30 minute summer	337.901	95.614
30 year +35% CC 30 minute winter	176.731	71.263	100 year +40% CC 30 minute winter	237.123	95.614
30 year +35% CC 60 minute summer	165.436	43.720	100 year +40% CC 60 minute summer	223.735	59.127
30 year +35% CC 60 minute winter	109.911	43.720	100 year +40% CC 60 minute winter	148.644	59.127
30 year +35% CC 120 minute summer	100.187	26.477	100 year +40% CC 120 minute summer	134.091	35.436
30 year +35% CC 120 minute winter	66.562	26.477	100 year +40% CC 120 minute winter	89.087	35.436
30 year +35% CC 180 minute summer	76.150	19.596	100 year +40% CC 180 minute summer	102.086	26.270
30 year +35% CC 180 minute winter	49.500	19.596	100 year +40% CC 180 minute winter	66.359	26.270
30 year +35% CC 240 minute summer	59.688	15.774	100 year +40% CC 240 minute summer	80.416	21.252
30 year +35% CC 240 minute winter	39.655	15.774	100 year +40% CC 240 minute winter	53.427	21.252
30 year +35% CC 360 minute summer	44.905	11.556	100 year +40% CC 360 minute summer	61.298	15.774
30 year +35% CC 360 minute winter	29.189	11.556	100 year +40% CC 360 minute winter	39.845	15.774
30 year +35% CC 480 minute summer	34.945	9.235	100 year +40% CC 480 minute summer	48.339	12.775
30 year +35% CC 480 minute winter	23.217	9.235	100 year +40% CC 480 minute winter	32.116	12.775
30 year +35% CC 600 minute summer	28.334	7.750	100 year +40% CC 600 minute summer	39.610	10.834
30 year +35% CC 600 minute winter	19.360	7.750	100 year +40% CC 600 minute winter	27.064	10.834
30 year +35% CC 720 minute summer	25.039	6.711	100 year +40% CC 720 minute summer	35.293	9.459
30 year +35% CC 720 minute winter	16.827	6.711	100 year +40% CC 720 minute winter	23.719	9.459
30 year +35% CC 960 minute summer	20.285	5.342	100 year +40% CC 960 minute summer	28.894	7.609
30 year +35% CC 960 minute winter	13.437	5.342	100 year +40% CC 960 minute winter	19.140	7.609
30 year +35% CC 1440 minute summer	14.418	3.864	100 year +40% CC 1440 minute summer	20.674	5.541
30 year +35% CC 1440 minute winter	9.690	3.864	100 year +40% CC 1440 minute winter	13.894	5.541

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.49%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE10	11	2.635	0.085	17.5	0.1272	0.0000	OK
15 minute summer	Ex. SMH1	12	2.119	0.111	24.8	0.1482	0.0000	OK
15 minute summer	S10	11	2.084	0.129	37.8	0.2303	0.0000	OK
15 minute summer	S20	11	1.998	0.175	51.9	0.2895	0.0000	OK
15 minute summer	Ex. SMH2	12	1.957	0.162	59.2	0.2530	0.0000	OK
15 minute summer	Ex. SMH3	12	1.719	0.209	75.6	0.4243	0.0000	OK
120 minute summer	SW-FCC	80	1.623	0.304	56.5	54.3763	0.0000	OK
15 minute summer	Ex. SW Outfall MH	1	1.232	0.000	19.3	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	RE10	1.000	Ex. SMH1	16.5	0.694	0.081	3.4113	
15 minute summer	Ex. SMH1	1.001	S10	22.7	0.694	0.111	0.4504	
15 minute summer	S10	1.002	S20	37.2	0.792	0.182	1.5563	
15 minute summer	S20	1.003	Ex. SMH2	50.8	0.946	0.249	0.3768	
15 minute summer	Ex. SMH2	1.004	Ex. SMH3	58.4	0.949	0.287	4.3903	
15 minute summer	Ex. SMH3	1.005	SW-FCC	75.4	1.450	0.438	3.9910	
120 minute summer	SW-FCC	Hydro-Brake®	Ex. SW Outfall MH	19.8				114.4

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.49%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE10	11	2.716	0.166	64.0	0.2488	0.0000	OK
120 minute winter	Ex. SMH1	102	2.523	0.515	27.5	0.6872	0.0000	SURCHARGED
120 minute winter	S10	104	2.522	0.567	45.6	1.0104	0.0000	SURCHARGED
120 minute winter	S20	106	2.525	0.702	61.7	1.1622	0.0000	SURCHARGED
120 minute winter	Ex. SMH2	102	2.525	0.730	68.1	1.1423	0.0000	SURCHARGED
120 minute winter	Ex. SMH3	106	2.520	1.010	86.7	2.0498	0.0000	SURCHARGED
120 minute winter	SW-FCC	104	2.518	1.199	113.7	214.8542	0.0000	SURCHARGED
15 minute summer	Ex. SW Outfall MH	1	1.232	0.000	20.4	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	RE10	1.000	Ex. SMH1	61.6	0.852	0.302	14.1164	
120 minute winter	Ex. SMH1	1.001	S10	27.3	0.698	0.134	2.1049	
120 minute winter	S10	1.002	S20	45.2	0.814	0.222	5.2198	
120 minute winter	S20	1.003	Ex. SMH2	58.9	0.977	0.289	1.1064	
120 minute winter	Ex. SMH2	1.004	Ex. SMH3	67.0	0.915	0.329	11.2837	
120 minute winter	Ex. SMH3	1.005	SW-FCC	74.3	0.989	0.432	10.5699	
120 minute winter	SW-FCC	Hydro-Brake®	Ex. SW Outfall MH	24.0				369.8

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.49%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	RE10	21	2.777	0.227	64.9	0.3398	0.0000	OK
30 minute summer	Ex. SMH1	20	2.788	0.780	95.8	1.0414	0.0000	SURCHARGED
30 minute summer	S10	20	2.780	0.825	127.2	1.4689	0.0000	SURCHARGED
120 minute winter	S20	114	2.736	0.913	68.4	1.5115	0.0000	SURCHARGED
120 minute winter	Ex. SMH2	110	2.735	0.940	72.2	1.4711	0.0000	SURCHARGED
120 minute winter	Ex. SMH3	114	2.731	1.221	88.7	2.4782	0.0000	SURCHARGED
120 minute winter	SW-FCC	112	2.729	1.410	128.5	252.5475	0.0000	SURCHARGED
15 minute summer	Ex. SW Outfall MH	1	1.232	0.000	21.6	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)
30 minute summer	RE10	1.000	Ex. SMH1	63.4	0.821	0.311	16.1845	
30 minute summer	Ex. SMH1	1.001	S10	73.5	0.618	0.361	2.1049	
30 minute summer	S10	1.002	S20	115.3	0.887	0.566	5.2198	
120 minute winter	S20	1.003	Ex. SMH2	62.1	0.983	0.305	1.1064	
120 minute winter	Ex. SMH2	1.004	Ex. SMH3	68.2	0.922	0.335	11.2837	
120 minute winter	Ex. SMH3	1.005	SW-FCC	85.2	1.016	0.495	10.5699	
120 minute winter	SW-FCC	Hydro-Brake®	Ex. SW Outfall MH	25.9				416.2

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.49%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	RE10	100	3.797	1.247	24.5	1.8640	0.0000	SURCHARGED
120 minute winter	Ex. SMH1	100	3.798	1.790	36.8	2.3895	0.0000	SURCHARGED
120 minute winter	S10	100	3.798	1.843	54.7	3.2825	0.0000	SURCHARGED
120 minute winter	S20	100	3.797	1.974	71.3	3.2682	0.0000	SURCHARGED
120 minute winter	Ex. SMH2	100	3.798	2.003	77.9	3.1351	0.0000	SURCHARGED
120 minute winter	Ex. SMH3	100	3.795	2.285	103.6	4.6358	0.0000	FLOOD RISK
120 minute winter	SW-FCC	100	3.791	2.472	152.7	290.2880	0.0000	SURCHARGED
15 minute summer	Ex. SW Outfall MH	1	1.232	0.000	23.3	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)
120 minute winter	RE10	1.000	Ex. SMH1	24.5	0.670	0.120	21.4859	
120 minute winter	Ex. SMH1	1.001	S10	31.7	0.697	0.156	2.1049	
120 minute winter	S10	1.002	S20	51.7	0.829	0.254	5.2198	
120 minute winter	S20	1.003	Ex. SMH2	67.0	1.003	0.329	1.1064	
120 minute winter	Ex. SMH2	1.004	Ex. SMH3	78.3	0.917	0.385	11.2837	
120 minute winter	Ex. SMH3	1.005	SW-FCC	102.2	1.044	0.595	10.5699	
120 minute winter	SW-FCC	Hydro-Brake®	Ex. SW Outfall MH	34.0				459.0