

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	30	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	5.000
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)	999.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
18	0.083	5.00	45.971	1200	505696.946	119378.733	1.500
19	0.027	5.00	44.453	1200	505696.267	119351.844	1.528
1	0.046	5.00	43.458	1200	505695.094	119334.349	1.575
20	0.050	5.00	44.700	1200	505675.358	119379.943	1.700
2	0.000		43.400	1350	505682.327	119334.278	1.700
2A	0.000		41.980	1350	505677.573	119309.260	1.780
3	0.052	5.00	41.672	1350	505674.904	119295.206	1.922
21	0.204	5.00	44.562	1200	505619.936	119377.895	1.577
22	0.059	5.00	42.629	1200	505620.451	119334.165	1.629
4	0.191	5.00	41.393	1500	505617.978	119303.748	2.293
5	0.237	5.00	40.862	1800	505553.972	119310.749	2.862
6	0.087	5.00	40.015	1800	505522.801	119308.351	2.515
7	0.097	5.00	39.082	1800	505492.792	119305.024	2.032
8	0.095	5.00	38.568	1800	505475.154	119304.798	2.028
9	0.000	5.00	37.470	1800	505474.384	119284.557	1.875
10	0.045	5.00	36.100	1800	505468.625	119265.091	1.875
11	0.000	5.00	35.200	1800	505468.690	119249.978	1.700
12	0.000	5.00	36.000	1800	505494.686	119250.220	2.935
13	0.000	5.00	35.400	1800	505499.188	119242.744	2.430
14	0.000	5.00	35.890	1875	505522.350	119243.609	3.155
Basin	0.000	5.00	32.500		505501.988	119190.045	1.550
FCC	0.000	5.00	32.500	1800	505518.120	119170.287	1.650
OUTFALL	0.000		31.982	1800	505535.198	119155.009	1.182

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	18	19	26.898	0.600	44.471	43.000	1.471	18.3	225	5.15	152.6
1.001	19	1	17.534	0.600	42.925	41.958	0.967	18.1	225	5.24	151.7
1.002	1	2	12.767	0.600	41.883	41.800	0.083	153.8	300	5.41	150.0
2.000	20	2	46.194	0.600	43.000	41.700	1.300	35.5	500	5.13	151.8
1.003	2	2A	25.466	0.600	41.700	40.200	1.500	17.0	500	5.46	145.9

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	3.074	122.2	45.8	1.275	1.228	0.083	0.0	95	2.860
1.001	3.087	122.7	60.3	1.303	1.275	0.110	0.0	111	3.072
1.002	1.265	89.4	84.6	1.275	1.300	0.156	0.0	233	1.431
2.000	5.932	5931.6	27.4	1.200	1.200	0.050	0.0	33	1.388
1.003	8.587	8587.4	108.6	1.200	1.280	0.206	0.0	58	2.771

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)
1.004	2A	3	14.305	0.600	40.200	39.750	0.450	31.8	375	5.53	148.2
1.005	3	4	57.563	0.600	39.750	39.175	0.575	100.1	375	6.06	144.6
3.000	21	22	43.733	0.600	42.985	41.000	1.985	22.0	300	5.22	151.9
3.001	22	4	30.517	0.600	41.000	39.175	1.825	16.7	375	5.33	151.1
1.006	4	5	64.388	0.600	39.100	38.000	1.100	58.5	450	6.47	135.6
1.007	5	6	31.263	0.600	38.000	37.500	0.500	62.5	600	6.63	134.6
1.008	6	14	64.744	0.600	37.500	32.735	4.765	13.6	600	6.80	137.2
1.009	7	8	17.639	0.600	37.050	36.540	0.510	34.6	600	5.07	133.5
1.010	8	9	20.256	0.600	36.540	35.595	0.945	21.4	600	5.13	132.9
1.011	9	10	20.300	0.600	35.595	34.225	1.370	14.8	600	5.19	132.4
1.012	10	11	15.113	0.600	34.225	33.500	0.725	20.8	600	5.24	132.6
1.013	11	12	25.997	0.600	33.500	33.065	0.435	59.8	600	5.37	129.3
1.014	12	13	8.727	0.600	33.065	32.970	0.095	91.9	600	5.43	128.3
1.015	13	14	23.178	0.600	32.970	32.735	0.235	98.6	600	5.59	128.1
1.016	14	Basin	57.304	0.600	32.735	30.950	1.785	32.1	600	7.02	116.9
1.017	Basin	FCC	25.507	0.600	30.950	30.850	0.100	255.1	900	7.24	105.0
1.018	FCC	OUTFALL	22.915	0.600	30.850	30.800	0.050	458.3	825	7.51	103.5

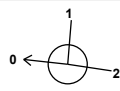
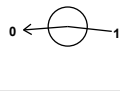
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.004	3.223	356.0	110.3	1.405	1.547	0.206	0.0	143	2.859
1.005	1.811	200.0	134.8	1.547	1.843	0.258	0.0	226	1.937
3.000	3.364	237.8	112.0	1.277	1.329	0.204	0.0	145	3.317
3.001	4.449	491.4	143.6	1.254	1.843	0.263	0.0	138	3.878
1.006	2.661	423.2	348.9	1.843	2.412	0.712	0.0	313	2.957
1.007	3.083	871.6	461.6	2.262	1.915	0.949	0.0	311	3.126
1.008	6.628	1874.0	513.7	1.915	2.555	1.036	0.0	214	5.694
1.009	4.149	1173.2	46.8	1.432	1.428	0.097	0.0	81	2.077
1.010	5.274	1491.3	92.2	1.428	1.275	0.192	0.0	99	2.989
1.011	6.346	1794.4	91.9	1.275	1.275	0.192	0.0	91	3.408
1.012	5.349	1512.3	113.6	1.275	1.100	0.237	0.0	110	3.214
1.013	3.153	891.6	110.7	1.100	2.335	0.237	0.0	142	2.184
1.014	2.541	718.5	109.9	2.335	1.830	0.237	0.0	157	1.863
1.015	2.452	693.2	109.7	1.830	2.555	0.237	0.0	160	1.812
1.016	4.307	1217.9	537.8	2.555	0.950	1.273	0.0	279	4.179
1.017	1.957	1244.9	483.1	0.650	0.750	1.273	0.0	388	1.839
1.018	1.380	737.7	476.2	0.825	0.357	1.273	0.0	484	1.462

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	26.898	18.3	225	Circular_Default Sewer Type	45.971	44.471	1.275	44.453	43.000	1.228
1.001	17.534	18.1	225	Circular_Default Sewer Type	44.453	42.925	1.303	43.458	41.958	1.275
1.002	12.767	153.8	300	Circular_Default Sewer Type	43.458	41.883	1.275	43.400	41.800	1.300
2.000	46.194	35.5	500	SWALE	44.700	43.000	1.200	43.400	41.700	1.200
1.003	25.466	17.0	500	SWALE	43.400	41.700	1.200	41.980	40.200	1.280
1.004	14.305	31.8	375	Circular_Default Sewer Type	41.980	40.200	1.405	41.672	39.750	1.547
1.005	57.563	100.1	375	Circular_Default Sewer Type	41.672	39.750	1.547	41.393	39.175	1.843
3.000	43.733	22.0	300	Circular_Default Sewer Type	44.562	42.985	1.277	42.629	41.000	1.329
3.001	30.517	16.7	375	Circular_Default Sewer Type	42.629	41.000	1.254	41.393	39.175	1.843
1.006	64.388	58.5	450	Circular_Default Sewer Type	41.393	39.100	1.843	40.862	38.000	2.412
1.007	31.263	62.5	600	Circular_Default Sewer Type	40.862	38.000	2.262	40.015	37.500	1.915
1.008	64.744	13.6	600	Circular_Default Sewer Type	40.015	37.500	1.915	35.890	32.735	2.555
1.009	17.639	34.6	600	Circular_Default Sewer Type	39.082	37.050	1.432	38.568	36.540	1.428
1.010	20.256	21.4	600	Circular_Default Sewer Type	38.568	36.540	1.428	37.470	35.595	1.275
1.011	20.300	14.8	600	Circular_Default Sewer Type	37.470	35.595	1.275	36.100	34.225	1.275
1.012	15.113	20.8	600	Circular_Default Sewer Type	36.100	34.225	1.275	35.200	33.500	1.100
1.013	25.997	59.8	600	Circular_Default Sewer Type	35.200	33.500	1.100	36.000	33.065	2.335
1.014	8.727	91.9	600	Circular_Default Sewer Type	36.000	33.065	2.335	35.400	32.970	1.830
1.015	23.178	98.6	600	Circular_Default Sewer Type	35.400	32.970	1.830	35.890	32.735	2.555
1.016	57.304	32.1	600	Circular_Default Sewer Type	35.890	32.735	2.555	32.500	30.950	0.950
1.017	25.507	255.1	900	Circular_Default Sewer Type	32.500	30.950	0.650	32.500	30.850	0.750
1.018	22.915	458.3	825	Circular_Default Sewer Type	32.500	30.850	0.825	31.982	30.800	0.357

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	18	1200	Manhole	Adoptable	19	1200	Manhole	Adoptable
1.001	19	1200	Manhole	Adoptable	1	1200	Manhole	Adoptable
1.002	1	1200	Manhole	Adoptable	2	1350	Manhole	Adoptable
2.000	20	1200	Manhole	Adoptable	2	1350	Manhole	Adoptable
1.003	2	1350	Manhole	Adoptable	2A	1350	Manhole	Adoptable
1.004	2A	1350	Manhole	Adoptable	3	1350	Manhole	Adoptable
1.005	3	1350	Manhole	Adoptable	4	1500	Manhole	Adoptable
3.000	21	1200	Manhole	Adoptable	22	1200	Manhole	Adoptable
3.001	22	1200	Manhole	Adoptable	4	1500	Manhole	Adoptable
1.006	4	1500	Manhole	Adoptable	5	1800	Manhole	Adoptable
1.007	5	1800	Manhole	Adoptable	6	1800	Manhole	Adoptable
1.008	6	1800	Manhole	Adoptable	14	1875	Manhole	Adoptable
1.009	7	1800	Manhole	Adoptable	8	1800	Manhole	Adoptable
1.010	8	1800	Manhole	Adoptable	9	1800	Manhole	Adoptable
1.011	9	1800	Manhole	Adoptable	10	1800	Manhole	Adoptable
1.012	10	1800	Manhole	Adoptable	11	1800	Manhole	Adoptable
1.013	11	1800	Manhole	Adoptable	12	1800	Manhole	Adoptable
1.014	12	1800	Manhole	Adoptable	13	1800	Manhole	Adoptable
1.015	13	1800	Manhole	Adoptable	14	1875	Manhole	Adoptable
1.016	14	1875	Manhole	Adoptable	Basin		Junction	
1.017	Basin		Junction		FCC	1800	Manhole	Adoptable
1.018	FCC	1800	Manhole	Adoptable	OUTFALL	1800	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
18	505696.946	119378.733	45.971	1.500	1200		0	1.000	44.471	225
19	505696.267	119351.844	44.453	1.528	1200		1	1.000	43.000	225
							0	1.001	42.925	225
1	505695.094	119334.349	43.458	1.575	1200		1	1.001	41.958	225
							0	1.002	41.883	300
20	505675.358	119379.943	44.700	1.700	1200		0	2.000	43.000	500
2	505682.327	119334.278	43.400	1.700	1350		1	2.000	41.700	500
							2	1.002	41.800	300
							0	1.003	41.700	500
2A	505677.573	119309.260	41.980	1.780	1350		1	1.003	40.200	500
							0	1.004	40.200	375
3	505674.904	119295.206	41.672	1.922	1350		1	1.004	39.750	375
							0	1.005	39.750	375
21	505619.936	119377.895	44.562	1.577	1200		0	3.000	42.985	300
22	505620.451	119334.165	42.629	1.629	1200		1	3.000	41.000	300
							0	3.001	41.000	375
4	505617.978	119303.748	41.393	2.293	1500		1	3.001	39.175	375
							2	1.005	39.175	375
							0	1.006	39.100	450
5	505553.972	119310.749	40.862	2.862	1800		1	1.006	38.000	450
							0	1.007	38.000	600
6	505522.801	119308.351	40.015	2.515	1800		1	1.007	37.500	600
							0	1.008	37.500	600
7	505492.792	119305.024	39.082	2.032	1800		0	1.009	37.050	600

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
8	505475.154	119304.798	38.568	2.028	1800		1	1.009	36.540	600
9	505474.384	119284.557	37.470	1.875	1800		1	1.010	36.540	600
							0	1.011	35.595	600
10	505468.625	119265.091	36.100	1.875	1800		1	1.011	34.225	600
11	505468.690	119249.978	35.200	1.700	1800		1	1.012	34.225	600
							0	1.012	33.500	600
12	505494.686	119250.220	36.000	2.935	1800		1	1.013	33.500	600
13	505499.188	119242.744	35.400	2.430	1800		1	1.013	33.065	600
							0	1.014	33.065	600
14	505522.350	119243.609	35.890	3.155	1875		1 2	1.015 1.008	32.970 32.735	600 600
Basin	505501.988	119190.045	32.500	1.550			1	1.016	32.735	600
							0	1.016	30.950	900
FCC	505518.120	119170.287	32.500	1.650	1800		1	1.017	30.950	900
OUTFALL	505535.198	119155.009	31.982	1.182	1800		1	1.018	30.850	825
							0	1.018	30.850	825

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	✓	Check Discharge Rate(s)	✓
Summer CV	1.000	Drain Down Time (mins)	1440	Check Discharge Volume	✓
Winter CV	1.000	Additional Storage (m³/ha)	0.0	100 year 360 minute (m³)	

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	45	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)		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 FCC Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	30.850	Product Number	CTL-SHE-0102-5200-1400-5200
Design Depth (m)	1.400	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.2	Min Node Diameter (mm)	1200

Node Basin Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00003	Safety Factor	2.0	Invert Level (m)	30.950
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	828.0	828.0	1.550	1719.0	828.0

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	18	9	44.608	0.137	81.2	0.1549	0.0000	OK
15 minute summer	19	11	43.334	0.409	107.4	0.4631	0.0000	SURCHARGED
15 minute summer	1	11	42.423	0.540	147.0	0.6112	0.0000	SURCHARGED
15 minute summer	20	10	43.045	0.045	48.9	0.0513	0.0000	OK
15 minute summer	2	11	41.779	0.079	194.3	0.1137	0.0000	OK
15 minute summer	2A	13	41.013	0.813	194.9	1.1631	0.0000	SURCHARGED
15 minute summer	3	12	40.915	1.165	238.8	1.6665	0.0000	SURCHARGED
15 minute summer	21	9	43.202	0.217	199.5	0.2457	0.0000	OK
15 minute summer	22	11	41.268	0.268	256.6	0.3032	0.0000	OK
15 minute summer	4	11	40.608	1.508	537.2	2.6651	0.0000	SURCHARGED
15 minute summer	5	11	38.520	0.520	756.0	1.3240	0.0000	OK
15 minute summer	6	11	37.774	0.274	837.7	0.6985	0.0000	OK
15 minute summer	7	10	37.168	0.118	94.9	0.3003	0.0000	OK
15 minute summer	8	10	36.698	0.158	187.4	0.4011	0.0000	OK
15 minute summer	9	10	35.728	0.133	186.7	0.3385	0.0000	OK
15 minute summer	10	10	34.395	0.170	230.0	0.4331	0.0000	OK
15 minute summer	11	10	33.724	0.224	228.7	0.5705	0.0000	OK
15 minute summer	12	11	33.362	0.297	227.1	0.7550	0.0000	OK
15 minute summer	13	11	33.255	0.285	228.4	0.7253	0.0000	OK
15 minute summer	14	10	33.224	0.489	1069.8	1.3501	0.0000	OK
960 minute winter	Basin	945	32.178	1.228	76.2	1450.1600	0.0000	SURCHARGED
960 minute winter	FCC	945	32.178	1.328	21.0	3.3797	0.0000	SURCHARGED
15 minute summer	OUTFALL	1	30.800	0.000	5.2	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	18	1.000	19	81.0	3.117	0.662	0.8632	
15 minute summer	19	1.001	1	104.1	2.618	0.848	0.6973	
15 minute summer	1	1.002	2	147.3	2.092	1.647	0.8862	
15 minute summer	20	2.000	2	48.5	1.139	0.008	2.0074	
15 minute summer	2	1.003	2A	194.9	1.379	0.023	30.9616	
15 minute summer	2A	1.004	3	223.5	2.026	0.628	1.5778	
15 minute summer	3	1.005	4	244.0	2.213	1.220	6.3490	
15 minute summer	21	3.000	22	198.9	3.570	0.836	2.5953	
15 minute summer	22	3.001	4	250.9	2.743	0.511	2.9692	
15 minute summer	4	1.006	5	535.0	3.377	1.264	10.2019	
15 minute summer	5	1.007	6	756.6	3.832	0.868	6.0203	
15 minute summer	6	1.008	14	838.3	4.538	0.447	12.0063	
15 minute summer	7	1.009	8	94.6	1.940	0.081	0.8642	
15 minute summer	8	1.010	9	186.7	3.554	0.125	1.0663	
15 minute summer	9	1.011	10	186.0	3.333	0.104	1.1368	
15 minute summer	10	1.012	11	228.7	2.840	0.151	1.2212	
15 minute summer	11	1.013	12	227.1	1.948	0.255	3.0370	
15 minute summer	12	1.014	13	228.4	1.748	0.318	1.1813	
15 minute summer	13	1.015	14	231.5	1.233	0.334	4.3612	
15 minute summer	14	1.016	Basin	1079.3	6.677	0.886	10.8383	
960 minute winter	Basin	1.017	FCC	21.0	0.242	0.017	16.1657	
960 minute winter	Basin	Infiltration		0.0				
960 minute winter	FCC	Hydro-Brake®	OUTFALL	5.2				673.8