

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	0.85
Return Period (years)	1	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	2.000
CV	1.000	Preferred Cover Depth (m)	0.600
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		

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	749	1500
499	1350	900	1800

>900 Link+900 mm

Max Depth (m)	Diameter (mm)	Max Depth (m)	Diameter (mm)
1.500	1050	99.999	1200

Circular Default Sewer Type Link Type

Shape	Circular	Auto Increment (mm)	75
Barrels	1	Follow Ground	x

Available Diameters (mm)

100 | 150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.011	5.00	9.850	1200	561695.323	178414.793	0.950
2	0.014	5.00	9.900	1200	561680.842	178415.211	1.105
3	0.015	5.00	9.725	1200	561680.058	178391.838	1.099
4	0.011	5.00	9.850	1200	561695.704	178391.349	1.337
7	0.010	5.00	9.850	1200	561713.708	178414.050	0.750
8	0.017	5.00	9.700	1200	561731.631	178413.636	0.750
9	0.000	3.00	9.850	1200	561732.144	178398.475	1.010
10	0.018	5.00	9.575	1200	561731.939	178390.195	0.937
11	0.100	5.00	9.850	1200	561713.123	178390.836	1.318
5	0.000		9.850	1200	561704.056	178389.596	1.474
12	0.015	5.00	9.700	1200	561672.317	178384.804	0.750
13	0.014	5.00	9.700	1200	561671.521	178363.492	0.904
14	0.012	5.00	9.700	1200	561694.188	178359.146	1.070
16	0.014	5.00	9.550	1200	561734.615	178379.385	0.750
17	0.018	5.00	9.425	1200	561734.064	178356.890	0.787
15	0.015	5.00	9.500	1200	561703.196	178360.852	1.086
6	0.025		9.600	1200	561703.619	178378.000	1.274
18	0.000		9.600	1200	561703.619	178370.000	1.252

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	14.487	0.600	8.900	8.795	0.105	138.0	150	5.28	34.8
1.001	2	3	23.386	0.600	8.795	8.626	0.169	138.4	150	5.74	33.9
1.002	3	4	15.654	0.600	8.626	8.513	0.113	138.5	150	6.05	33.3
1.003	4	5	8.534	0.600	8.513	8.451	0.062	137.6	150	6.21	32.9
2.000	7	8	17.928	0.600	9.100	8.950	0.150	119.5	150	5.33	34.7
2.001	8	9	15.170	0.600	8.950	8.840	0.110	137.9	150	5.62	34.1
2.002	9	10	8.283	0.600	8.840	8.640	0.200	41.4	150	5.71	34.0
2.003	10	11	18.827	0.600	8.638	8.532	0.106	177.6	225	6.03	33.3
2.004	11	5	9.151	0.600	8.532	8.376	0.156	58.7	225	6.12	33.1
1.004	5	6	11.604	0.600	8.376	8.326	0.050	232.1	225	6.44	32.4
3.000	12	13	21.327	0.600	8.950	8.796	0.154	138.5	150	5.42	34.5
3.001	13	14	23.080	0.600	8.796	8.630	0.166	139.0	150	5.87	33.6
3.002	14	15	9.168	0.600	8.630	8.414	0.216	42.4	150	5.97	33.4
4.000	16	17	22.502	0.600	8.800	8.638	0.162	138.9	150	5.44	34.5
4.001	17	15	31.121	0.600	8.638	8.414	0.224	138.9	150	6.05	33.3
3.003	15	18	9.158	0.600	8.414	8.348	0.066	138.8	150	6.23	32.9

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	0.853	15.1	1.4	0.800	0.955	0.011	0.0	31	0.533
1.001	0.852	15.1	3.1	0.955	0.949	0.025	0.0	46	0.671
1.002	0.852	15.1	4.8	0.949	1.187	0.040	0.0	58	0.759
1.003	0.854	15.1	6.1	1.187	1.249	0.051	0.0	66	0.807
2.000	0.918	16.2	1.3	0.600	0.600	0.010	0.0	28	0.547
2.001	0.854	15.1	3.3	0.600	0.860	0.027	0.0	48	0.686
2.002	1.568	27.7	3.3	0.860	0.785	0.027	0.0	35	1.058
2.003	0.978	38.9	5.4	0.712	1.093	0.045	0.0	57	0.693
2.004	1.711	68.0	17.4	1.093	1.249	0.145	0.0	77	1.432
1.004	0.854	33.9	23.0	1.249	1.049	0.196	0.0	136	0.915
3.000	0.852	15.1	1.9	0.600	0.754	0.015	0.0	35	0.579
3.001	0.850	15.0	3.5	0.754	0.920	0.029	0.0	50	0.696
3.002	1.549	27.4	5.0	0.920	0.936	0.041	0.0	43	1.178
4.000	0.851	15.0	1.7	0.600	0.637	0.014	0.0	34	0.566
4.001	0.850	15.0	3.8	0.637	0.936	0.032	0.0	52	0.714
3.003	0.851	15.0	10.5	0.936	1.102	0.088	0.0	92	0.919

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	14.487	138.0	150	Circular_Default Sewer Type	9.850	8.900	0.800	9.900	8.795	0.955
1.001	23.386	138.4	150	Circular_Default Sewer Type	9.900	8.795	0.955	9.725	8.626	0.949
1.002	15.654	138.5	150	Circular_Default Sewer Type	9.725	8.626	0.949	9.850	8.513	1.187
1.003	8.534	137.6	150	Circular_Default Sewer Type	9.850	8.513	1.187	9.850	8.451	1.249

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

Pipeline Schedule

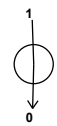
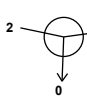
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
2.000	17.928	119.5	150	Circular_Default Sewer Type	9.850	9.100	0.600	9.700	8.950	0.600
2.001	15.170	137.9	150	Circular_Default Sewer Type	9.700	8.950	0.600	9.850	8.840	0.860
2.002	8.283	41.4	150	Circular_Default Sewer Type	9.850	8.840	0.860	9.575	8.640	0.785
2.003	18.827	177.6	225	Circular_Default Sewer Type	9.575	8.638	0.712	9.850	8.532	1.093
2.004	9.151	58.7	225	Circular_Default Sewer Type	9.850	8.532	1.093	9.850	8.376	1.249
1.004	11.604	232.1	225	Circular_Default Sewer Type	9.850	8.376	1.249	9.600	8.326	1.049
3.000	21.327	138.5	150	Circular_Default Sewer Type	9.700	8.950	0.600	9.700	8.796	0.754
3.001	23.080	139.0	150	Circular_Default Sewer Type	9.700	8.796	0.754	9.700	8.630	0.920
3.002	9.168	42.4	150	Circular_Default Sewer Type	9.700	8.630	0.920	9.500	8.414	0.936
4.000	22.502	138.9	150	Circular_Default Sewer Type	9.550	8.800	0.600	9.425	8.638	0.637
4.001	31.121	138.9	150	Circular_Default Sewer Type	9.425	8.638	0.637	9.500	8.414	0.936
3.003	9.158	138.8	150	Circular_Default Sewer Type	9.500	8.414	0.936	9.600	8.348	1.102

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.000	7	1200	Manhole	Adoptable	8	1200	Manhole	Adoptable
2.001	8	1200	Manhole	Adoptable	9	1200	Manhole	Adoptable
2.002	9	1200	Manhole	Adoptable	10	1200	Manhole	Adoptable
2.003	10	1200	Manhole	Adoptable	11	1200	Manhole	Adoptable
2.004	11	1200	Manhole	Adoptable	5	1200	Manhole	Adoptable
1.004	5	1200	Manhole	Adoptable	6	1200	Manhole	Adoptable
3.000	12	1200	Manhole	Adoptable	13	1200	Manhole	Adoptable
3.001	13	1200	Manhole	Adoptable	14	1200	Manhole	Adoptable
3.002	14	1200	Manhole	Adoptable	15	1200	Manhole	Adoptable
4.000	16	1200	Manhole	Adoptable	17	1200	Manhole	Adoptable
4.001	17	1200	Manhole	Adoptable	15	1200	Manhole	Adoptable
3.003	15	1200	Manhole	Adoptable	18	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	561695.323	178414.793	9.850	0.950	1200		0	1.000	8.900	150
2	561680.842	178415.211	9.900	1.105	1200		1	1.000	8.795	150
3	561680.058	178391.838	9.725	1.099	1200		0	1.001	8.795	150
							1	1.001	8.626	150
							0	1.002	8.626	150
4	561695.704	178391.349	9.850	1.337	1200		1	1.002	8.513	150
							0	1.003	8.513	150
7	561713.708	178414.050	9.850	0.750	1200		0	2.000	9.100	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
8	561731.631	178413.636	9.700	0.750	1200		1	2.000	8.950	150
9	561732.144	178398.475	9.850	1.010	1200		1	2.001	8.840	150
10	561731.939	178390.195	9.575	0.937	1200		1	2.002	8.640	150
11	561713.123	178390.836	9.850	1.318	1200		1	2.003	8.532	225
5	561704.056	178389.596	9.850	1.474	1200		1	2.004	8.376	225
12	561672.317	178384.804	9.700	0.750	1200		2	1.003	8.451	150
13	561671.521	178363.492	9.700	0.904	1200		0	1.004	8.376	225
14	561694.188	178359.146	9.700	1.070	1200		1	2.004	8.532	225
16	561734.615	178379.385	9.550	0.750	1200		1	2.003	8.638	225
17	561734.064	178356.890	9.425	0.787	1200		0	2.004	8.376	225
15	561703.196	178360.852	9.500	1.086	1200		1	3.000	8.950	150
6	561703.619	178378.000	9.600	1.274	1200		0	3.001	8.796	150
18	561703.619	178370.000	9.600	1.252	1200		1	3.003	8.348	150

Simulation Settings

Rainfall Methodology	FEH-22	Drain Down Time (mins)	240
Rainfall Events	Consecutive	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Starting Level (m)	
Additional Area (A %)	0	Check Discharge Rate(s)	✓
Additional Flow (Q %)	0	Check Discharge Volume	✓
Analysis Speed	Normal	100 year 360 minute (m³)	
Skip Steady State	✓		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Time Offset (mins)	Duration (mins)	Return Period (years)	Climate Change (CC %)	Time Offset (mins)	Duration (mins)	Return Period (years)	Climate Change (CC %)
0	1598	100	45	1440		10	45

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 6 Offline Orifice Control

Flap Valve	x	Design Depth (m)	0.800	Discharge Coefficient	0.600
Loop to Node	18	Design Flow (l/s)	75.0		
Invert Level (m)	8.326	Diameter (m)	0.207		

Node 6 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	7.351	Depth (m)	1.200
Side Inf Coefficient (m/hr)	0.03424	Time to half empty (mins)	1598	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	1.000	Number Required	2
Porosity	0.95	Pit Length (m)	24.000		

Node 18 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	7.298	Depth (m)	1.200
Side Inf Coefficient (m/hr)	0.03424	Time to half empty (mins)	1598	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	1.000	Number Required	1
Porosity	0.95	Pit Length (m)	24.000		

Node 17 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.03960	Invert Level (m)	8.800	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	120	Depth (m)	0.400
Safety Factor	2.0	Width (m)	9.100	Inf Depth (m)	0.400
Porosity	0.30	Length (m)	43.000		

Node 8 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.03960	Invert Level (m)	9.200	Slope (1:X)	300.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.400
Safety Factor	2.0	Width (m)	6.200	Inf Depth (m)	0.400
Porosity	0.30	Length (m)	40.000		

Node 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.03960	Invert Level (m)	9.350	Slope (1:X)	300.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.400
Safety Factor	2.0	Width (m)	6.200	Inf Depth (m)	0.400
Porosity	0.30	Length (m)	40.000		

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Results for Consecutive Rainfall Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1598-120	1	3120	8.928	0.028	1.2	0.0322	0.0000	OK
1598-120	2	3120	8.838	0.043	2.7	0.0482	0.0000	OK
1598-120	3	3120	8.681	0.055	4.3	0.0624	0.0000	OK
1598-120	4	3120	8.580	0.067	5.4	0.0752	0.0000	OK
1598-120	7	3120	9.126	0.026	1.1	0.0298	0.0000	OK
1598-120	8	3120	8.997	0.047	2.9	0.0529	0.0000	OK
1598-120	9	3120	8.873	0.033	2.9	0.0369	0.0000	OK
1598-120	10	3120	8.691	0.053	4.8	0.0596	0.0000	OK
1598-120	11	3120	8.605	0.073	15.5	0.0822	0.0000	OK
1598-120	5	3120	8.526	0.150	20.9	0.1696	0.0000	OK
1598-15	12	960	9.013	0.063	1.0	0.0709	0.0000	OK
1598-15	13	960	9.013	0.217	1.9	0.2450	0.0000	SURCHARGED
1598-15	14	960	9.012	0.382	2.7	0.4321	0.0000	SURCHARGED
1598-15	16	960	9.010	0.210	0.9	0.2375	0.0000	SURCHARGED
1598-15	17	960	9.010	0.372	4.5	20.0169	0.0000	SURCHARGED
1598-15	15	960	9.012	0.598	5.6	0.6758	0.0000	SURCHARGED
1598-120	6	3120	8.492	0.166	23.5	52.2411	0.0000	OK
1598-15	18	960	9.012	0.664	5.6	28.1224	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)
1598-120	1	1.000	2	1.2	0.374	0.079	0.0466	
1598-120	1	Infiltration		0.0				
1598-120	2	1.001	3	2.7	0.537	0.177	0.1168	
1598-120	3	1.002	4	4.2	0.633	0.282	0.1049	
1598-120	4	1.003	5	5.4	0.663	0.358	0.0697	
1598-120	7	2.000	8	1.1	0.329	0.067	0.0606	
1598-120	8	2.001	9	2.9	0.772	0.190	0.0569	
1598-120	8	Infiltration		0.0				
1598-120	9	2.002	10	2.9	0.719	0.103	0.0333	
1598-120	10	2.003	11	4.7	0.526	0.122	0.1706	
1598-120	11	2.004	5	15.5	0.792	0.228	0.1792	
1598-120	5	1.004	6	20.8	0.696	0.612	0.3458	
1598-15	12	3.000	13	1.0	0.370	0.066	0.2620	
1598-15	13	3.001	14	1.9	0.620	0.125	0.4063	
1598-15	14	3.002	15	2.7	0.529	0.097	0.1614	
1598-15	16	4.000	17	0.9	0.345	0.059	0.3961	
1598-15	17	4.001	15	-2.7	0.366	-0.180	0.5479	
1598-15	17	Infiltration		2.2				
1598-15	15	3.003	18	5.6	0.763	0.370	0.1612	
1598-120	6	Infiltration		0.5				
1598-120	6	Orifice	18	20.7				333.5
1598-15	18	Infiltration		0.3				