APPENDIX E
DRAINAGE NETWORK HYDRAULIC SIMULATIONS

Design Settings

Rainfall Methodology	FEH-13	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)
1	0.025	5.00	42.991	1350	505825.613	119255.110	1.591
1A	0.047	5.00	42.700	130	505804.052	119256.194	2.200
2	0.059	5.00	41.581	1350	505799.250	119235.196	2.581
12	0.039	5.00	40.370	1350	505785.575	119220.078	1.570
3	0.030	5.00	41.547	1800	505804.710	119229.618	2.947
13	0.063	5.00	43.990	1350	505876.291	119234.561	1.790
15	0.067	5.00	43.617	1350	505876.558	119204.843	1.517
14	0.012	5.00	43.775	1350	505875.982	119217.527	1.775
4	0.098	5.00	41.264	1800	505818.657	119203.617	2.839
5	0.124	5.00	40.648	1350	505818.002	119154.701	3.098
6	0.075	5.00	39.459	1350	505780.507	119159.437	2.059
7	0.000	5.00	38.500	1350	505781.749	119144.946	1.400
16	0.058	5.00	42.250	1350	505877.422	119138.534	1.650
22	0.014	5.00	41.742	1350	505877.271	119112.376	2.242
17	0.020	5.00	42.071	1350	505877.838	119124.761	2.746
17A	0.025	5.00	41.288	1350	505851.009	119126.571	2.322
18	0.036	5.00	40.361	1350	505819.921	119128.669	1.811
23	0.036	5.00	39.165	1350	505853.765	119069.256	1.765
24	0.070	5.00	38.700	1500	505811.982	119076.545	1.650
19	0.064	5.00	39.626	1500	505818.468	119100.257	2.766
20	0.007	5.00	39.500	1500	505804.182	119102.802	2.690
21	0.000	5.00	38.500	1350	505796.371	119112.124	1.735
8	0.000	5.00	38.500	1350	505784.316	119138.008	1.800
9	0.000	5.00	38.500	1350	505779.989	119135.463	1.810
10	0.000	5.00	38.500	1500	505771.972	119132.379	1.825
11	0.000		38.500	1350	505754.448	119137.347	1.900

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	Flow (l/s)	Pro Velocity (m/s)
1.000	1	2	33.039	0.600	Colebrook-White	41.400	39.000	2.400	13.8	225	5.17	50.0	4.5	1.644
8.000	1A	2	21.540	0.600	Colebrook-White	40.500	39.000	1.500	14.4	225	5.10	50.0	8.5	1.936
1.001	2	3	7.805	0.600	Colebrook-White	39.000	38.675	0.325	24.0	225	5.21	50.0	23.7	2.164
2.000	12	3	21.381	0.600	Colebrook-White	38.800	38.675	0.125	171.0	225	5.28	50.0	7.0	0.754
1.002	3	4	29.505	0.600	Colebrook-White	38.600	38.425	0.175	168.6	300	5.76	50.0	36.1	1.159
3.000	13	14	17.037	0.600	Colebrook-White	42.200	42.000	0.200	85.2	225	5.12	50.0	11.4	1.113
4.000	15	14	12.697	0.600	Colebrook-White	42.100	42.000	0.100	127.0	225	5.05	50.0	12.1	0.981

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	Flow (l/s)	Pro Velocity (m/s)
3.001	14	4	58.989	0.600	Colebrook-White	42.000	38.500	3.500	16.9	225	5.50	50.0	25.7	2.518
1.003	4	5	48.921	0.600	Colebrook-White	38.425	37.625	0.800	61.2	300	6.20	50.0	79.5	2.067
1.004	5	6	33.474	0.600	Colebrook-White	37.550	37.400	0.150	223.2	375	6.57	50.0	101.9	1.326
1.005	6	7	13.293	0.600	Colebrook-White	37.400	37.100	0.300	44.3	375	6.64	50.0	115.5	2.554
1.006	7	8	7.645	0.600	Colebrook-White	37.100	36.700	0.400	19.1	375	6.67	50.0	115.5	3.490
5.000	16	17	13.779	0.600	Colebrook-White	40.600	39.400	1.200	11.5	225	5.05	50.0	10.5	2.227
6.000	22	17	12.398	0.600	Colebrook-White	39.500	39.400	0.100	124.0	225	5.18	50.0	2.5	0.632
5.001	17	17A	58.049	0.600	Colebrook-White	39.325	38.966	0.359	161.7	300	5.85	50.0	16.6	0.955
5.001a	17A	18	31.159	0.600	Colebrook-White	38.966	38.550	0.416	74.9	300	6.14	50.0	21.1	1.353
5.002	18	19	28.449	0.600	Colebrook-White	38.550	36.860	1.690	16.8	300	5.97	50.0	27.6	2.505
7.000	23	24	44.295	0.600	Colebrook-White	37.400	37.050	0.350	126.6	300	5.45	50.0	6.5	0.799
7.001	24	20	24.631	0.600	Colebrook-White	37.050	36.935	0.115	214.2	300	5.78	50.0	19.2	0.898
5.003	19	20	14.511	0.600	Colebrook-White	36.860	36.810	0.050	290.2	375	6.09	50.0	39.2	0.956
5.004	20	21	12.162	0.600	Colebrook-White	36.810	36.765	0.045	270.3	375	6.19	50.0	59.6	1.093
5.005	21	8	28.554	0.600	Colebrook-White	36.765	36.700	0.065	439.3	375	6.42	50.0	59.6	0.905
1.007	8	9	5.020	0.600	Colebrook-White	36.700	36.690	0.010	502.0	525	6.71	50.0	175.1	1.101
1.008	9	10	8.590	0.600	Colebrook-White	36.690	36.675	0.015	572.7	525	6.78	50.0	175.1	1.040
1.009	10	11	18.215	0.600	Colebrook-White	36.675	36.600	0.075	242.9	525	6.93	49.5	173.3	1.470

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	33.039	13.8	225	Circular_Default Sewer Type	42.991	41.400	1.366	41.581	39.000	2.356
8.000	21.540	14.4	225	Circular_Default Sewer Type	42.700	40.500	1.975	41.581	39.000	2.356
1.001	7.805	24.0	225	Circular_Default Sewer Type	41.581	39.000	2.356	41.547	38.675	2.647
2.000	21.381	171.0	225	Circular_Default Sewer Type	40.370	38.800	1.345	41.547	38.675	2.647
1.002	29.505	168.6	300	Circular_Default Sewer Type	41.547	38.600	2.647	41.264	38.425	2.539
3.000	17.037	85.2	225	Circular_Default Sewer Type	43.990	42.200	1.565	43.775	42.000	1.550

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1350	Manhole	Adoptable	2	1350	Manhole	Adoptable
8.000	1A	130	Manhole	Adoptable	2	1350	Manhole	Adoptable
1.001	2	1350	Manhole	Adoptable	3	1800	Manhole	Adoptable
2.000	12	1350	Manhole	Adoptable	3	1800	Manhole	Adoptable
1.002	3	1800	Manhole	Adoptable	4	1800	Manhole	Adoptable
3.000	13	1350	Manhole	Adoptable	14	1350	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)
4.000	12.697	127.0	225	Circular_Default Sewer Type	43.617	42.100	1.292	43.775	42.000	1.550
3.001	58.989	16.9	225	Circular_Default Sewer Type	43.775	42.000	1.550	41.264	38.500	2.539
1.003	48.921	61.2	300	Circular_Default Sewer Type	41.264	38.425	2.539	40.648	37.625	2.723
1.004	33.474	223.2	375	Circular_Default Sewer Type	40.648	37.550	2.723	39.459	37.400	1.684
1.005	13.293	44.3	375	Circular_Default Sewer Type	39.459	37.400	1.684	38.500	37.100	1.025
1.006	7.645	19.1	375	Circular_Default Sewer Type	38.500	37.100	1.025	38.500	36.700	1.425
5.000	13.779	11.5	225	Circular_Default Sewer Type	42.250	40.600	1.425	42.071	39.400	2.446
6.000	12.398	124.0	225	Circular_Default Sewer Type	41.742	39.500	2.017	42.071	39.400	2.446
5.001	58.049	161.7	300	Circular_Default Sewer Type	42.071	39.325	2.446	41.288	38.966	2.022
5.001a	31.159	74.9	300	Circular_Default Sewer Type	41.288	38.966	2.022	40.361	38.550	1.511
5.002	28.449	16.8	300	Circular_Default Sewer Type	40.361	38.550	1.511	39.626	36.860	2.466
7.000	44.295	126.6	300	Circular_Default Sewer Type	39.165	37.400	1.465	38.700	37.050	1.350
7.001	24.631	214.2	300	Circular_Default Sewer Type	38.700	37.050	1.350	39.500	36.935	2.265
5.003	14.511	290.2	375	Circular_Default Sewer Type	39.626	36.860	2.391	39.500	36.810	2.315
5.004	12.162	270.3	375	Circular_Default Sewer Type	39.500	36.810	2.315	38.500	36.765	1.360
5.005	28.554	439.3	375	Circular_Default Sewer Type	38.500	36.765	1.360	38.500	36.700	1.425
1.007	5.020	502.0	525	Circular_Default Sewer Type	38.500	36.700	1.275	38.500	36.690	1.285
1.008	8.590	572.7	525	Circular_Default Sewer Type	38.500	36.690	1.285	38.500	36.675	1.300
1.009	18.215	242.9	525	Circular_Default Sewer Type	38.500	36.675	1.300	38.500	36.600	1.375

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
4.000	15	1350	Manhole	Adoptable	14	1350	Manhole	Adoptable
3.001	14	1350	Manhole	Adoptable	4	1800	Manhole	Adoptable
1.003	4	1800	Manhole	Adoptable	5	1350	Manhole	Adoptable
1.004	5	1350	Manhole	Adoptable	6	1350	Manhole	Adoptable
1.005	6	1350	Manhole	Adoptable	7	1350	Manhole	Adoptable
1.006	7	1350	Manhole	Adoptable	8	1350	Manhole	Adoptable
5.000	16	1350	Manhole	Adoptable	17	1350	Manhole	Adoptable
6.000	22	1350	Manhole	Adoptable	17	1350	Manhole	Adoptable
5.001	17	1350	Manhole	Adoptable	17A	1350	Manhole	Adoptable
5.001a	17A	1350	Manhole	Adoptable	18	1350	Manhole	Adoptable
5.002	18	1350	Manhole	Adoptable	19	1500	Manhole	Adoptable
7.000	23	1350	Manhole	Adoptable	24	1500	Manhole	Adoptable
7.001	24	1500	Manhole	Adoptable	20	1500	Manhole	Adoptable
5.003	19	1500	Manhole	Adoptable	20	1500	Manhole	Adoptable
5.004	20	1500	Manhole	Adoptable	21	1350	Manhole	Adoptable
5.005	21	1350	Manhole	Adoptable	8	1350	Manhole	Adoptable
1.007	8	1350	Manhole	Adoptable	9	1350	Manhole	Adoptable
1.008	9	1350	Manhole	Adoptable	10	1500	Manhole	Adoptable
1.009	10	1500	Manhole	Adoptable	11	1350	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FEH-13	Drain Down Time (mins)	240	100 year (l/s)	19.4
Summer CV	1.000	Additional Storage (m³/ha)	20.0	Check Discharge Volume	✓
Winter CV	1.000	Check Discharge Rate(s)	✓	100 year 360 minute (m³)	
Analysis Speed	Normal	2 year (l/s)	6.1		
Skip Steady State	✓	30 year (l/s)	13.8		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	45	0	0
30	0	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	SPR	0.10	Betterment (%)	0
Greenfield Method	IH124	Region	1	QBar	0.4
Positively Drained Area (ha)	1.600	Growth Factor 2 year	0.90	Q 2 year (l/s)	0.4
SAAR (mm)	975	Growth Factor 30 year	1.95	Q 30 year (l/s)	0.8
Soil Index	1	Growth Factor 100 year	2.48	Q 100 year (l/s)	1.0

Pre-development Discharge Volume

Site Makeup	Greenfield	SPR	0.10	Storm Duration (mins)	360
Greenfield Method	FSR/FEH	CWI		Betterment (%)	0
Positively Drained Area (ha)	1.600	Return Period (years)	100	PR	
Soil Index	1	Climate Change (%)	0	Runoff Volume (m^3)	

Node 10 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	36.675	Product Number	CTL-SHE-0093-4900-1800-4900
Design Depth (m)	1.800	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	4.9	Min Node Diameter (mm)	1200

Node 8 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	36.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	112.0	0.0	1.000	716.0	0.0	1.600	1140.0	0.0
0.700	371.0	0.0	1.200	979.0	0.0	1.601	0.1	0.0

Node 24 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	37.050	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.500
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node 23 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	37.400	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.500
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node 12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	38.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	96.0	0.0	0.500	96.0	0.0	0.501	0.1	0.0

Node 12 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	38.800	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.500
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node 1A Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	40.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.50	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	21.0	0.0	0.500	88.0	0.0	0.501	0.1	0.0

Design Settings

Rainfall Methodology	FEH-13	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)
1	0.036	5.00	50.174	1350	505886.038	119373.294	1.425
24	0.052	5.00	49.687	1350	505844.920	119380.442	1.425
2	0.006	5.00	49.952	1350	505870.436	119376.667	1.852
25	0.020	5.00	47.612	1350	505875.099	119318.933	1.337
3	0.088	5.00	47.730	1350	505855.155	119325.079	1.755
26	0.017	5.00	47.466	1350	505763.582	119368.861	1.425
27	0.039	5.00	46.423	1350	505764.497	119345.180	1.698
28	0.049	5.00	46.256	1350	505778.097	119339.029	1.806
30	0.056	5.00	47.789	1350	505816.148	119355.399	1.589
29	0.042	5.00	47.214	1350	505815.146	119336.783	3.014
4	0.061	5.00	47.482	1350	505827.021	119332.912	3.482
5	0.093	5.00	46.555	1350	505822.726	119315.479	2.955
31	0.042	5.00	45.447	1350	505847.228	119283.170	1.444
6	0.046	5.00	44.834	1350	505816.686	119287.199	1.834
7	0.038	5.00	44.435	1350	505810.459	119282.801	1.679
8	0.070	5.00	43.022	1350	505773.872	119286.298	2.385
9	0.022	5.00	41.727	1350	505757.570	119270.538	1.775
10	0.053	5.00	41.192	1350	505736.217	119280.411	2.120
11	0.089	5.00	40.592	1350	505714.819	119286.929	1.970
12	0.029	5.00	38.622	1350	505702.517	119252.248	1.711
13	0.083	5.00	37.601	1500	505694.383	119225.207	1.575
50	0.075	5.00	37.223	1350	505729.877	119207.048	1.573
51	0.068	5.00	37.019	1350	505715.426	119212.491	1.444
14	0.010	5.00	37.373	1500	505700.000	119217.854	2.101
15	0.013	5.00	36.835	1500	505682.404	119208.746	1.650
16	0.000	5.00	35.700	1500	505672.875	119195.120	1.200
17	0.000	5.00	35.700	1500	505671.119	119190.998	1.500
18	0.000	5.00	35.700	1350	505664.303	119195.056	1.702
19	0.000	5.00	34.900	1350	505646.540	119203.986	1.300
32	0.048	5.00	46.086	1350	505748.391	119367.450	1.525
43	0.026	5.00	44.453	1350	505748.964	119328.755	1.425
33	0.013	5.00	45.043	1350	505748.754	119341.612	2.091
44	0.037	5.00	44.578	1350	505695.395	119358.976	1.425
45	0.021	5.00	43.913	1350	505695.799	119343.956	1.425
34	0.059	5.00	44.057	1350	505699.817	119339.813	1.782
35	0.064	5.00	43.508	1350	505693.764	119332.101	1.908
36	0.077	5.00	41.208	1350	505686.644	119294.375	1.582
46	0.052	5.00	46.067	1350	505667.004	119394.116	1.305
47	0.043	5.00	44.641	1350	505666.947	119368.176	1.641
48	0.085	5.00	42.664	1500	505663.423	119332.540	2.664
49	0.045	5.00	40.871	1350	505659.717	119299.067	1.229
37	0.005	5.00	40.871	1500	505667.569	119297.837	1.626
38	0.044	5.00	39.188	1500	505662.559	119259.433	1.788
39	0.007	5.00	36.561	1500	505653.159	119231.388	2.117
52	0.107	5.00	40.741	1350	505623.101	119303.234	1.398
53	0.024	5.00	40.443	1350	505609.510	119304.394	1.425
54	0.090	5.00	38.091	1350	505605.884	119267.762	1.867
55	0.016	5.00	39.450	1350	505549.977	119286.707	1.450
56	0.065	5.00	38.229	1350	505548.695	119261.442	1.625

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
57	0.000	5.00	37.372	1350	505547.535	119246.188	1.425
58	0.050	5.00	36.250	1350	505582.297	119238.823	1.225
40	0.118	5.00	36.756	1500	505602.996	119235.993	2.656
41	0.000	5.00	36.600	1500	505601.082	119229.870	3.100
42	0.000	5.00	34.800	1500	505599.686	119218.074	1.500
20	0.000		34.800	1500	505598.895	119212.371	1.650
21	0.000	5.00	34.800	1500	505585.207	119211.594	1.672
22	0.000		34.775	1500	505579.045	119205.905	1.665
23	0.000		34.600	1500	505577.244	119198.521	1.500

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	17.451	0.600	Colebrook-White	48.749	48.100	0.649	26.9	225	5.20	50.0
2.000	24	2	24.384	0.600	Colebrook-White	48.262	48.100	0.162	150.5	225	5.41	50.0
1.001	2	3	54.380	0.600	Colebrook-White	48.100	46.050	2.050	26.5	225	5.78	50.0
3.000	25	3	21.543	0.600	Colebrook-White	46.275	46.050	0.225	95.7	225	5.36	50.0
1.002	3	4	28.532	0.600	Colebrook-White	45.975	44.075	1.900	15.0	300	6.26	50.0
4.000	26	27	22.043	0.600	Colebrook-White	46.041	44.800	1.241	17.8	225	5.13	50.0
4.001	27	28	7.962	0.600	Colebrook-White	44.725	44.450	0.275	29.0	300	5.20	50.0
4.002	28	29	46.200	0.600	Colebrook-White	44.450	44.200	0.250	184.8	300	5.97	50.0
5.000	30	29	18.643	0.600	Colebrook-White	46.200	44.275	1.925	9.7	225	5.13	50.0
4.003	29	4	12.490	0.600	Colebrook-White	44.200	44.075	0.125	99.9	300	6.18	50.0
1.003	4	5	17.954	0.600	Colebrook-White	44.000	43.600	0.400	44.9	375	6.56	50.0
1.004	5	6	28.918	0.600	Colebrook-White	43.600	43.075	0.525	55.1	375	6.69	50.0
6.000	31	6	30.807	0.600	Colebrook-White	44.003	43.225	0.778	39.6	225	5.27	50.0
1.005	6	7	7.624	0.600	Colebrook-White	43.000	42.756	0.244	31.2	450	6.72	50.0
1.006	7	8	36.754	0.600	Colebrook-White	42.756	40.637	2.119	17.3	450	6.86	49.8
1.007	8	9	22.674	0.600	Colebrook-White	40.637	40.037	0.600	37.8	450	7.00	49.3
1.008	9	10	23.525	0.600	Colebrook-White	39.952	39.072	0.880	26.7	525	7.10	49.0
1.009	10	11	22.369	0.600	Colebrook-White	39.072	38.622	0.450	49.7	525	7.25	48.5
1.010	11	12	36.798	0.600	Colebrook-White	38.622	36.911	1.711	21.5	525	7.40	48.0
1.011	12	13	28.238	0.600	Colebrook-White	36.911	36.026	0.885	31.9	525	7.55	47.6

Flow (l/s)	Pro Velocity (m/s)
6.5	1.431
9.4	0.857
17.0	1.905
3.6	0.773
36.5	2.827
3.1	1.326
10.1	1.542
19.0	0.945
10.1	2.360
36.7	1.414
84.2	2.343
101.0	2.275
7.6	1.316
116.9	2.877
123.3	3.620
134.5	2.791
137.6	3.146
145.5	2.548
159.4	3.545
163.1	3.088

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	Flow (l/s)	Pro Velocity (m/s)
1.012	13	14	9.253	0.600	Colebrook-White	36.026	35.272	0.754	12.3	525	7.60	47.4	176.6	4.462
11.000	50	51	15.442	0.600	Colebrook-White	35.650	35.575	0.075	205.9	300	5.14	50.0	13.6	0.827
11.001	51	14	16.332	0.600	Colebrook-White	35.575	35.497	0.078	209.4	300	5.41	50.0	25.8	0.980
1.013	14	15	19.814	0.600	Colebrook-White	35.272	35.185	0.087	227.7	525	7.85	46.6	199.4	1.557
1.014	15	16	16.627	0.600	Colebrook-White	35.185	34.500	0.685	24.3	525	7.90	46.5	201.2	3.616
1.015	16	17	4.480	0.600	Colebrook-White	34.500	34.200	0.300	14.9	525	7.98	46.2	199.9	4.308
1.016	17	18	16.633	0.600	Colebrook-White	34.200	33.998	0.202	82.3	525	8.25	45.5	196.8	2.288
1.017	18	19	11.175	0.600	Colebrook-White	33.998	33.600	0.398	28.1	525	8.29	45.4	196.4	3.405
1.018	19	20	48.377	0.600	Colebrook-White	33.600	33.150	0.450	107.5	525	9.09	43.3	187.3	2.044
7.000	32	33	25.841	0.600	Colebrook-White	44.561	42.952	1.609	16.1	225	5.16	50.0	8.7	1.881
8.000	43	33	12.859	0.600	Colebrook-White	43.028	42.952	0.076	169.2	225	5.21	50.0	4.7	0.678
7.001	33	34	48.970	0.600	Colebrook-White	42.952	42.350	0.602	81.3	225	5.83	50.0	15.7	1.242
9.000	44	45	15.025	0.600	Colebrook-White	43.153	42.488	0.665	22.6	225	5.09	50.0	6.7	1.540
9.001	45	34	5.771	0.600	Colebrook-White	42.488	42.350	0.138	41.8	225	5.19	50.0	10.5	1.416
7.002	34	35	9.804	0.600	Colebrook-White	42.275	41.600	0.675	14.5	300	5.86	50.0	36.9	2.861
7.003	35	36	38.392	0.600	Colebrook-White	41.600	39.626	1.974	19.4	300	6.14	50.0	48.4	2.778
7.004	36	37	19.387	0.600	Colebrook-White	39.626	39.395	0.231	83.9	300	6.37	50.0	62.3	1.729
10.000	46	47	25.940	0.600	Colebrook-White	44.762	43.000	1.762	14.7	225	5.13	50.0	9.4	1.991
10.001	47	48	35.810	0.600	Colebrook-White	43.000	40.000	3.000	11.9	225	5.29	50.0	17.2	2.538
10.002	48	49	33.678	0.600	Colebrook-White	40.000	39.642	0.358	94.1	225	5.56	50.0	32.5	1.412
10.003	49	37	7.948	0.600	Colebrook-White	39.642	39.470	0.172	46.2	225	5.69	50.0	40.7	1.956
7.005	37	38	38.729	0.600	Colebrook-White	39.245	37.400	1.845	21.0	450	6.61	50.0	103.9	3.223
7.006	38	39	30.245	0.600	Colebrook-White	37.400	34.444	2.956	10.2	450	6.74	50.0	111.9	4.262
7.007	39	40	47.859	0.600	Colebrook-White	34.444	34.175	0.269	177.9	450	7.54	47.6	107.7	1.479
12.000	52	53	13.640	0.600	Colebrook-White	39.343	39.018	0.325	42.0	225	5.11	50.0	19.3	1.675
12.001	53	54	36.811	0.600	Colebrook-White	39.018	36.224	2.794	13.2	225	5.28	50.0	23.7	2.687
12.002	54	40	31.900	0.600	Colebrook-White	36.224	34.400	1.824	17.5	225	5.53	50.0	39.9	2.808
13.000	55	56	25.298	0.600	Colebrook-White	38.000	36.604	1.396	18.1	225	5.14	50.0	2.9	1.282

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	Flow (l/s)	Pro Velocity (m/s)
13.001	56	57	15.298	0.600	Colebrook-White	36.604	35.947	0.657	23.3	225	5.22	50.0	14.6	1.919
13.002	57	58	35.534	0.600	Colebrook-White	35.947	35.025	0.922	38.5	225	5.48	50.0	14.6	1.590
13.003	58	40	20.892	0.600	Colebrook-White	35.025	34.400	0.625	33.4	225	5.82	50.0	23.7	1.923
7.008	40	41	6.415	0.600	Colebrook-White	34.100	33.500	0.600	10.7	525	7.65	47.3	187.4	4.771
7.009	41	42	11.878	0.600	Colebrook-White	33.500	33.300	0.200	59.4	525	7.68	47.2	187.0	2.550
7.010	42	20	5.758	0.600	Colebrook-White	33.300	33.150	0.150	38.4	525	7.76	46.9	185.8	2.993
1.019	20	21	13.710	0.600	Colebrook-White	33.150	33.128	0.022	623.2	750	9.31	42.7	353.9	1.206
1.020	21	22	11.157	0.600	Colebrook-White	33.128	33.110	0.018	619.8	750	9.50	42.3	350.5	1.207
1.021	22	23	4.516	0.600	Colebrook-White	33.110	33.100	0.010	451.6	675	9.51	42.3	350.5	1.355

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	17.451	26.9	225	Circular_Default Sewer Type	50.174	48.749	1.200	49.952	48.100	1.627
2.000	24.384	150.5	225	Circular_Default Sewer Type	49.687	48.262	1.200	49.952	48.100	1.627
1.001	54.380	26.5	225	Circular_Default Sewer Type	49.952	48.100	1.627	47.730	46.050	1.455
3.000	21.543	95.7	225	Circular_Default Sewer Type	47.612	46.275	1.112	47.730	46.050	1.455
1.002	28.532	15.0	300	Circular_Default Sewer Type	47.730	45.975	1.455	47.482	44.075	3.107
4.000	22.043	17.8	225	Circular_Default Sewer Type	47.466	46.041	1.200	46.423	44.800	1.398
4.001	7.962	29.0	300	Circular_Default Sewer Type	46.423	44.725	1.398	46.256	44.450	1.506
4.002	46.200	184.8	300	Circular_Default Sewer Type	46.256	44.450	1.506	47.214	44.200	2.714
5.000	18.643	9.7	225	Circular_Default Sewer Type	47.789	46.200	1.364	47.214	44.275	2.714
4.003	12.490	99.9	300	Circular_Default Sewer Type	47.214	44.200	2.714	47.482	44.075	3.107
1.003	17.954	44.9	375	Circular_Default Sewer Type	47.482	44.000	3.107	46.555	43.600	2.580
1.004	28.918	55.1	375	Circular_Default Sewer Type	46.555	43.600	2.580	44.834	43.075	1.384
6.000	30.807	39.6	225	Circular_Default Sewer Type	45.447	44.003	1.219	44.834	43.225	1.384
1.005	7.624	31.2	450	Circular_Default Sewer Type	44.834	43.000	1.384	44.435	42.756	1.229
1.006	36.754	17.3	450	Circular_Default Sewer Type	44.435	42.756	1.229	43.022	40.637	1.935

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1350	Manhole	Adoptable	2	1350	Manhole	Adoptable
2.000	24	1350	Manhole	Adoptable	2	1350	Manhole	Adoptable
1.001	2	1350	Manhole	Adoptable	3	1350	Manhole	Adoptable
3.000	25	1350	Manhole	Adoptable	3	1350	Manhole	Adoptable
1.002	3	1350	Manhole	Adoptable	4	1350	Manhole	Adoptable
4.000	26	1350	Manhole	Adoptable	27	1350	Manhole	Adoptable
4.001	27	1350	Manhole	Adoptable	28	1350	Manhole	Adoptable
4.002	28	1350	Manhole	Adoptable	29	1350	Manhole	Adoptable
5.000	30	1350	Manhole	Adoptable	29	1350	Manhole	Adoptable
4.003	29	1350	Manhole	Adoptable	4	1350	Manhole	Adoptable
1.003	4	1350	Manhole	Adoptable	5	1350	Manhole	Adoptable
1.004	5	1350	Manhole	Adoptable	6	1350	Manhole	Adoptable
6.000	31	1350	Manhole	Adoptable	6	1350	Manhole	Adoptable
1.005	6	1350	Manhole	Adoptable	7	1350	Manhole	Adoptable
1.006	7	1350	Manhole	Adoptable	8	1350	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)
1.007	22.674	37.8	450	Circular_Default Sewer Type	43.022	40.637	1.935	41.727	40.037	1.240
1.008	23.525	26.7	525	Circular_Default Sewer Type	41.727	39.952	1.250	41.192	39.072	1.595
1.009	22.369	49.7	525	Circular_Default Sewer Type	41.192	39.072	1.595	40.592	38.622	1.445
1.010	36.798	21.5	525	Circular_Default Sewer Type	40.592	38.622	1.445	38.622	36.911	1.186
1.011	28.238	31.9	525	Circular_Default Sewer Type	38.622	36.911	1.186	37.601	36.026	1.050
1.012	9.253	12.3	525	Circular_Default Sewer Type	37.601	36.026	1.050	37.373	35.272	1.576
11.000	15.442	205.9	300	Circular_Default Sewer Type	37.223	35.650	1.273	37.019	35.575	1.144
11.001	16.332	209.4	300	Circular_Default Sewer Type	37.019	35.575	1.144	37.373	35.497	1.576
1.013	19.814	227.7	525	Circular_Default Sewer Type	37.373	35.272	1.576	36.835	35.185	1.125
1.014	16.627	24.3	525	Circular_Default Sewer Type	36.835	35.185	1.125	35.700	34.500	0.675
1.015	4.480	14.9	525	Circular_Default Sewer Type	35.700	34.500	0.675	35.700	34.200	0.975
1.016	16.633	82.3	525	Circular_Default Sewer Type	35.700	34.200	0.975	35.700	33.998	1.177
1.017	11.175	28.1	525	Circular_Default Sewer Type	35.700	33.998	1.177	34.900	33.600	0.775
1.018	48.377	107.5	525	Circular_Default Sewer Type	34.900	33.600	0.775	34.800	33.150	1.125
7.000	25.841	16.1	225	Circular_Default Sewer Type	46.086	44.561	1.300	45.043	42.952	1.866
8.000	12.859	169.2	225	Circular_Default Sewer Type	44.453	43.028	1.200	45.043	42.952	1.866
7.001	48.970	81.3	225	Circular_Default Sewer Type	45.043	42.952	1.866	44.057	42.350	1.482
9.000	15.025	22.6	225	Circular_Default Sewer Type	44.578	43.153	1.200	43.913	42.488	1.200
9.001	5.771	41.8	225	Circular_Default Sewer Type	43.913	42.488	1.200	44.057	42.350	1.482
7.002	9.804	14.5	300	Circular_Default Sewer Type	44.057	42.275	1.482	43.508	41.600	1.608
7.003	38.392	19.4	300	Circular_Default Sewer Type	43.508	41.600	1.608	41.208	39.626	1.282
7.004	19.387	83.9	300	Circular_Default Sewer Type	41.208	39.626	1.282	40.871	39.395	1.176
10.000	25.940	14.7	225	Circular_Default Sewer Type	46.067	44.762	1.080	44.641	43.000	1.416
10.001	35.810	11.9	225	Circular_Default Sewer Type	44.641	43.000	1.416	42.664	40.000	2.439
10.002	33.678	94.1	225	Circular_Default Sewer Type	42.664	40.000	2.439	40.871	39.642	1.004
10.003	7.948	46.2	225	Circular_Default Sewer Type	40.871	39.642	1.004	40.871	39.470	1.176
7.005	38.729	21.0	450	Circular_Default Sewer Type	40.871	39.245	1.176	39.188	37.400	1.338
7.006	30.245	10.2	450	Circular_Default Sewer Type	39.188	37.400	1.338	36.561	34.444	1.667

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.007	8	1350	Manhole	Adoptable	9	1350	Manhole	Adoptable
1.008	9	1350	Manhole	Adoptable	10	1350	Manhole	Adoptable
1.009	10	1350	Manhole	Adoptable	11	1350	Manhole	Adoptable
1.010	11	1350	Manhole	Adoptable	12	1350	Manhole	Adoptable
1.011	12	1350	Manhole	Adoptable	13	1500	Manhole	Adoptable
1.012	13	1500	Manhole	Adoptable	14	1500	Manhole	Adoptable
11.000	50	1350	Manhole	Adoptable	51	1350	Manhole	Adoptable
11.001	51	1350	Manhole	Adoptable	14	1500	Manhole	Adoptable
1.013	14	1500	Manhole	Adoptable	15	1500	Manhole	Adoptable
1.014	15	1500	Manhole	Adoptable	16	1500	Manhole	Adoptable
1.015	16	1500	Manhole	Adoptable	17	1500	Manhole	Adoptable
1.016	17	1500	Manhole	Adoptable	18	1350	Manhole	Adoptable
1.017	18	1350	Manhole	Adoptable	19	1350	Manhole	Adoptable
1.018	19	1350	Manhole	Adoptable	20	1500	Manhole	Adoptable
7.000	32	1350	Manhole	Adoptable	33	1350	Manhole	Adoptable
8.000	43	1350	Manhole	Adoptable	33	1350	Manhole	Adoptable
7.001	33	1350	Manhole	Adoptable	34	1350	Manhole	Adoptable
9.000	44	1350	Manhole	Adoptable	45	1350	Manhole	Adoptable
9.001	45	1350	Manhole	Adoptable	34	1350	Manhole	Adoptable
7.002	34	1350	Manhole	Adoptable	35	1350	Manhole	Adoptable
7.003	35	1350	Manhole	Adoptable	36	1350	Manhole	Adoptable
7.004	36	1350	Manhole	Adoptable	37	1500	Manhole	Adoptable
10.000	46	1350	Manhole	Adoptable	47	1350	Manhole	Adoptable
10.001	47	1350	Manhole	Adoptable	48	1500	Manhole	Adoptable
10.002	48	1500	Manhole	Adoptable	49	1350	Manhole	Adoptable
10.003	49	1350	Manhole	Adoptable	37	1500	Manhole	Adoptable
7.005	37	1500	Manhole	Adoptable	38	1500	Manhole	Adoptable
7.006	38	1500	Manhole	Adoptable	39	1500	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)
7.007	47.859	177.9	450	Circular_Default Sewer Type	36.561	34.444	1.667	36.756	34.175	2.131
12.000	13.640	42.0	225	Circular_Default Sewer Type	40.741	39.343	1.173	40.443	39.018	1.200
12.001	36.811	13.2	225	Circular_Default Sewer Type	40.443	39.018	1.200	38.091	36.224	1.642
12.002	31.900	17.5	225	Circular_Default Sewer Type	38.091	36.224	1.642	36.756	34.400	2.131
13.000	25.298	18.1	225	Circular_Default Sewer Type	39.450	38.000	1.225	38.229	36.604	1.400
13.001	15.298	23.3	225	Circular_Default Sewer Type	38.229	36.604	1.400	37.372	35.947	1.200
13.002	35.534	38.5	225	Circular_Default Sewer Type	37.372	35.947	1.200	36.250	35.025	1.000
13.003	20.892	33.4	225	Circular_Default Sewer Type	36.250	35.025	1.000	36.756	34.400	2.131
7.008	6.415	10.7	525	Circular_Default Sewer Type	36.756	34.100	2.131	36.600	33.500	2.575
7.009	11.878	59.4	525	Circular_Default Sewer Type	36.600	33.500	2.575	34.800	33.300	0.975
7.010	5.758	38.4	525	Circular_Default Sewer Type	34.800	33.300	0.975	34.800	33.150	1.125
1.019	13.710	623.2	750	Circular_Default Sewer Type	34.800	33.150	0.900	34.800	33.128	0.922
1.020	11.157	619.8	750	Circular_Default Sewer Type	34.800	33.128	0.922	34.775	33.110	0.915
1.021	4.516	451.6	675	Circular_Default Sewer Type	34.775	33.110	0.990	34.600	33.100	0.825

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
7.007	39	1500	Manhole	Adoptable	40	1500	Manhole	Adoptable
12.000	52	1350	Manhole	Adoptable	53	1350	Manhole	Adoptable
12.001	53	1350	Manhole	Adoptable	54	1350	Manhole	Adoptable
12.002	54	1350	Manhole	Adoptable	40	1500	Manhole	Adoptable
13.000	55	1350	Manhole	Adoptable	56	1350	Manhole	Adoptable
13.001	56	1350	Manhole	Adoptable	57	1350	Manhole	Adoptable
13.002	57	1350	Manhole	Adoptable	58	1350	Manhole	Adoptable
13.003	58	1350	Manhole	Adoptable	40	1500	Manhole	Adoptable
7.008	40	1500	Manhole	Adoptable	41	1500	Manhole	Adoptable
7.009	41	1500	Manhole	Adoptable	42	1500	Manhole	Adoptable
7.010	42	1500	Manhole	Adoptable	20	1500	Manhole	Adoptable
1.019	20	1500	Manhole	Adoptable	21	1500	Manhole	Adoptable
1.020	21	1500	Manhole	Adoptable	22	1500	Manhole	Adoptable
1.021	22	1500	Manhole	Adoptable	23	1500	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FEH-13	Drain Down Time (mins)	240	100 year (l/s)	19.4
Summer CV	1.000	Additional Storage (m³/ha)	20.0	Check Discharge Volume	✓
Winter CV	1.000	Check Discharge Rate(s)	✓	100 year 360 minute (m³)	
Analysis Speed	Normal	2 year (l/s)	6.1		
Skip Steady State	✓	30 year (l/s)	13.8		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	45	0	0
30	0	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	SPR	0.10	Betterment (%)	0
Greenfield Method	IH124	Region	1	QBar	2.0
Positively Drained Area (ha)	8.000	Growth Factor 2 year	0.90	Q 2 year (l/s)	1.8
SAAR (mm)	999	Growth Factor 30 year	1.95	Q 30 year (l/s)	4.0
Soil Index	1	Growth Factor 100 year	2.48	Q 100 year (l/s)	5.1

Pre-development Discharge Volume

Site Makeup	Greenfield	SPR	0.10	Storm Duration (mins)	360
Greenfield Method	FSR/FEH	CWI		Betterment (%)	0
Positively Drained Area (ha)	8.000	Return Period (years)	100	PR	
Soil Index	1	Climate Change (%)	0	Runoff Volume (m^3)	

Node 22 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	33.110	Product Number	CTL-SHE-0154-1250-1500-1250
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	12.5	Min Node Diameter (mm)	1500

Node 20 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	33.150
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	198.0	0.0	1.150	1354.0	0.0	1.650	2187.0	0.0
0.150	758.0	0.0	1.250	1783.0	0.0	1.651	0.1	0.0

Node 17 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	34.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	240.0	0.0	1.100	718.0	0.0	1.501	0.1	0.0
1.000	340.0	0.0	1.500	1059.0	0.0			

Node 50 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	35.650	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	8	Depth (m)	0.500
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.30	Length (m)	15.000		

Node 51 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	35.575	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	8	Depth (m)	0.500
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	40.000		

Node 13 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	36.026	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	5	Depth (m)	0.500
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	15.000		

Node 52 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	39.343	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.500
Safety Factor	2.0	Width (m)	8.000	Inf Depth (m)	
Porosity	0.30	Length (m)	25.000		

Node 39 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	34.444
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	7

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	20.0	0.0	0.400	20.0	0.0	0.401	0.1	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	116.144	32.865	30 year 360 minute summer	36.346	9.353
2 year 15 minute winter	81.505	32.865	30 year 360 minute winter	23.626	9.353
2 year 30 minute summer	76.046	21.518	30 year 480 minute summer	28.382	7.500
2 year 30 minute winter	53.366	21.518	30 year 480 minute winter	18.856	7.500
2 year 60 minute summer	51.462	13.600	30 year 600 minute summer	23.086	6.315
2 year 60 minute winter	34.190	13.600	30 year 600 minute winter	15.774	6.315
2 year 120 minute summer	35.529	9.389	30 year 720 minute summer	20.462	5.484
2 year 120 minute winter	23.604	9.389	30 year 720 minute winter	13.752	5.484
2 year 180 minute summer	28.732	7.394	30 year 960 minute summer	16.671	4.390
2 year 180 minute winter	18.677	7.394	30 year 960 minute winter	11.043	4.390
2 year 240 minute summer	23.420	6.189	30 year 1440 minute summer	11.951	3.203
2 year 240 minute winter	15.560	6.189	30 year 1440 minute winter	8.032	3.203
2 year 360 minute summer	18.509	4.763	30 year 2160 minute summer	8.505	2.351
2 year 360 minute winter	12.031	4.763	30 year 2160 minute winter	5.860	2.351
2 year 480 minute summer	14.851	3.925	30 year 2880 minute summer	7.078	1.897
2 year 480 minute winter	9.867	3.925	30 year 2880 minute winter	4.757	1.897
2 year 600 minute summer	12.301	3.365	30 year 4320 minute summer	5.406	1.413
2 year 600 minute winter	8.405	3.365	30 year 4320 minute winter	3.560	1.413
2 year 720 minute summer	11.046	2.960	30 year 5760 minute summer	4.524	1.158
2 year 720 minute winter	7.423	2.960	30 year 5760 minute winter	2.928	1.158
2 year 960 minute summer	9.150	2.409	30 year 7200 minute summer	3.924	1.001
2 year 960 minute winter	6.061	2.409	30 year 7200 minute winter	2.533	1.001
2 year 1440 minute summer	6.695	1.794	30 year 8640 minute summer	3.508	0.895
2 year 1440 minute winter	4.500	1.794	30 year 8640 minute winter	2.264	0.895
2 year 2160 minute summer	4.844	1.339	30 year 10080 minute summer	3.211	0.819
2 year 2160 minute winter	3.338	1.339	30 year 10080 minute winter	2.072	0.819
2 year 2880 minute summer	4.081	1.094	100 year +45% CC 15 minute summer	546.775	154.718
2 year 2880 minute winter	2.743	1.094	100 year +45% CC 15 minute winter	383.702	154.718
2 year 4320 minute summer	3.193	0.835	100 year +45% CC 30 minute summer	366.816	103.796
2 year 4320 minute winter	2.103	0.835	100 year +45% CC 30 minute winter	257.415	103.796
2 year 5760 minute summer	2.728	0.698	100 year +45% CC 60 minute summer	251.917	66.574
2 year 5760 minute winter	1.766	0.698	100 year +45% CC 60 minute winter	167.367	66.574
2 year 7200 minute summer	2.412	0.615	100 year +45% CC 120 minute summer	147.617	39.011
2 year 7200 minute winter	1.557	0.615	100 year +45% CC 120 minute winter	98.073	39.011
2 year 8640 minute summer	2.193	0.559	100 year +45% CC 180 minute summer	110.822	28.518
2 year 8640 minute winter	1.415	0.559	100 year +45% CC 180 minute winter	72.037	28.518
2 year 10080 minute summer	2.037	0.520	100 year +45% CC 240 minute summer	86.398	22.833
2 year 10080 minute winter	1.315	0.520	100 year +45% CC 240 minute winter	57.401	22.833
30 year 15 minute summer	298.112	84.355	100 year +45% CC 360 minute summer	64.865	16.692
30 year 15 minute winter	209.201	84.355	100 year +45% CC 360 minute winter	42.164	16.692
30 year 30 minute summer	198.287	56.108	100 year +45% CC 480 minute summer	50.544	13.357
30 year 30 minute winter	139.149	56.108	100 year +45% CC 480 minute winter	33.580	13.357
30 year 60 minute summer	135.115	35.707	100 year +45% CC 600 minute summer	41.086	11.238
30 year 60 minute winter	89.767	35.707	100 year +45% CC 600 minute winter	28.073	11.238
30 year 120 minute summer	80.945	21.391	100 year +45% CC 720 minute summer	36.419	9.761
30 year 120 minute winter	53.778	21.391	100 year +45% CC 720 minute winter	24.476	9.761
30 year 180 minute summer	61.384	15.796	100 year +45% CC 960 minute summer	29.709	7.823
30 year 180 minute winter	39.901	15.796	100 year +45% CC 960 minute winter	19.680	7.823
30 year 240 minute summer	48.131	12.720	100 year +45% CC 1440 minute summer	21.359	5.724
30 year 240 minute winter	31.977	12.720	100 year +45% CC 1440 minute winter	14.354	5.724

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +45% CC 2160 minute summer	15.208	4.203	100 year +45% CC 5760 minute winter	5.114	2.023
100 year +45% CC 2160 minute winter	10.479	4.203	100 year +45% CC 7200 minute summer	6.777	1.729
100 year +45% CC 2880 minute summer	12.625	3.384	100 year +45% CC 7200 minute winter	4.374	1.729
100 year +45% CC 2880 minute winter	8.485	3.384	100 year +45% CC 8640 minute summer	5.997	1.530
100 year +45% CC 4320 minute summer	9.543	2.495	100 year +45% CC 8640 minute winter	3.870	1.530
100 year +45% CC 4320 minute winter	6.285	2.495	100 year +45% CC 10080 minute summer	5.437	1.387
100 year +45% CC 5760 minute summer	7.901	2.023	100 year +45% CC 10080 minute winter	3.509	1.387

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	48.788	0.039	6.8	0.0763	0.0000	OK
15 minute summer	24	10	48.338	0.076	9.9	0.1653	0.0000	OK
15 minute summer	2	11	48.164	0.064	17.6	0.0953	0.0000	OK
15 minute summer	25	10	46.316	0.041	3.8	0.0706	0.0000	OK
15 minute summer	3	11	46.050	0.075	37.2	0.1817	0.0000	OK
15 minute summer	26	10	46.066	0.025	3.2	0.0419	0.0000	OK
15 minute summer	27	10	44.771	0.046	10.6	0.0864	0.0000	OK
15 minute summer	28	11	44.549	0.099	19.8	0.1945	0.0000	OK
15 minute summer	30	10	46.238	0.038	10.6	0.0814	0.0000	OK
15 minute summer	29	11	44.331	0.131	37.8	0.2240	0.0000	OK
15 minute summer	4	11	44.147	0.147	85.7	0.2612	0.0000	OK
15 minute summer	5	11	43.771	0.171	102.7	0.3527	0.0000	OK
15 minute summer	31	10	44.050	0.047	8.0	0.0954	0.0000	OK
15 minute summer	6	11	43.169	0.169	119.3	0.3267	0.0000	OK
15 minute summer	7	11	42.877	0.121	126.3	0.2276	0.0000	OK
15 minute summer	8	11	40.808	0.171	139.1	0.3458	0.0000	OK
15 minute summer	9	11	40.092	0.140	143.2	0.2359	0.0000	OK
15 minute summer	10	11	39.258	0.186	152.8	0.3591	0.0000	OK
15 minute summer	11	11	38.764	0.142	168.6	0.3312	0.0000	OK
15 minute summer	12	11	37.085	0.174	173.5	0.3084	0.0000	OK
15 minute summer	13	11	36.164	0.138	187.7	1.2515	0.0000	OK
15 minute summer	50	11	35.736	0.086	14.2	0.8797	0.0000	OK
15 minute summer	51	12	35.697	0.122	25.7	1.4088	0.0000	OK
15 minute summer	14	11	35.578	0.306	211.3	0.5699	0.0000	OK
15 minute summer	15	12	35.367	0.182	213.0	0.3497	0.0000	OK
15 minute summer	16	11	34.707	0.207	214.0	0.3649	0.0000	OK
30 minute summer	17	22	34.402	0.202	196.8	50.9273	0.0000	OK
30 minute summer	18	22	34.151	0.153	137.6	0.2185	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	1	1.000	2	6.7	1.026	0.067	0.1202
15 minute summer	24	2.000	2	9.8	0.935	0.231	0.2549
15 minute summer	2	1.001	3	17.4	1.906	0.172	0.4967
15 minute summer	25	3.000	3	3.7	0.766	0.069	0.1037
15 minute summer	3	1.002	4	37.2	2.785	0.129	0.3809
15 minute summer	26	4.000	27	3.2	1.327	0.026	0.0526
15 minute summer	27	4.001	28	10.5	0.818	0.051	0.1066
15 minute summer	28	4.002	29	19.4	0.787	0.238	1.1472
15 minute summer	30	5.000	29	10.5	2.130	0.063	0.1119
15 minute summer	29	4.003	4	37.6	1.353	0.338	0.3467
15 minute summer	4	1.003	5	85.9	1.935	0.287	0.7975
15 minute summer	5	1.004	6	103.2	2.216	0.382	1.3479
15 minute summer	31	6.000	6	7.8	1.307	0.094	0.1844
15 minute summer	6	1.005	7	119.4	2.710	0.206	0.3376
15 minute summer	7	1.006	8	126.4	2.837	0.162	1.6465
15 minute summer	8	1.007	9	139.2	2.681	0.264	1.1777
15 minute summer	9	1.008	10	143.2	2.506	0.152	1.3496
15 minute summer	10	1.009	11	152.5	2.654	0.221	1.2905
15 minute summer	11	1.010	12	168.3	3.079	0.160	2.0154
15 minute summer	12	1.011	13	172.7	3.219	0.201	1.5193
15 minute summer	13	1.012	14	186.1	2.146	0.134	0.8128
15 minute summer	50	11.000	51	13.4	0.623	0.173	0.3330
15 minute summer	51	11.001	14	24.1	0.938	0.315	0.4197
15 minute summer	14	1.013	15	211.1	2.159	0.659	1.9437
15 minute summer	15	1.014	16	214.0	3.008	0.217	1.2002
15 minute summer	16	1.015	17	215.2	3.810	0.171	0.2987
30 minute summer	17	1.016	18	137.6	2.145	0.257	1.0701
30 minute summer	18	1.017	19	137.5	2.141	0.150	0.7212

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	19	22	33.803	0.203	137.5	0.2905	0.0000	OK
15 minute summer	32	10	44.601	0.040	9.1	0.0825	0.0000	OK
15 minute summer	43	10	43.081	0.053	4.9	0.0944	0.0000	OK
15 minute summer	33	11	43.034	0.082	16.4	0.1277	0.0000	OK
15 minute summer	44	10	43.191	0.038	7.0	0.0747	0.0000	OK
15 minute summer	45	10	42.549	0.061	11.0	0.1055	0.0000	OK
15 minute summer	34	11	42.350	0.075	37.3	0.1579	0.0000	OK
15 minute summer	35	11	41.689	0.089	49.1	0.1870	0.0000	OK
15 minute summer	36	11	39.793	0.167	63.2	0.4021	0.0000	OK
15 minute summer	46	10	44.803	0.041	9.9	0.0909	0.0000	OK
15 minute summer	47	10	43.052	0.052	18.0	0.1016	0.0000	OK
15 minute summer	48	10	40.133	0.133	33.9	0.3199	0.0000	OK
15 minute summer	49	11	39.779	0.137	41.6	0.2968	0.0000	OK
15 minute summer	37	11	39.370	0.125	106.2	0.2284	0.0000	OK
15 minute summer	38	11	37.501	0.101	114.3	0.2271	0.0000	OK
15 minute summer	39	12	34.667	0.223	115.6	4.8622	0.0000	OK
15 minute summer	52	11	39.425	0.082	20.3	1.0576	0.0000	OK
15 minute summer	53	11	39.080	0.062	23.7	0.1088	0.0000	OK
15 minute summer	54	11	36.314	0.090	40.0	0.2167	0.0000	OK
15 minute summer	55	10	38.024	0.024	3.0	0.0400	0.0000	OK
15 minute summer	56	10	36.662	0.058	15.3	0.1290	0.0000	OK
15 minute summer	57	10	36.011	0.064	15.2	0.0917	0.0000	OK
15 minute summer	58	11	35.108	0.083	24.5	0.1865	0.0000	OK
15 minute summer	40	11	34.246	0.146	189.8	0.3882	0.0000	OK
15 minute summer	41	11	33.738	0.238	189.4	0.4209	0.0000	OK
480 minute summer	42	384	33.702	0.402	51.8	0.7103	0.0000	OK
480 minute summer	20	392	33.700	0.550	132.7	423.3720	0.0000	OK
480 minute summer	21	392	33.700	0.572	15.5	1.0105	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
30 minute summer	19	1.018	20	137.2	1.894	0.294	3.8387
15 minute summer	32	7.000	33	9.0	1.122	0.069	0.2293
15 minute summer	43	8.000	33	4.8	0.509	0.121	0.1288
15 minute summer	33	7.001	34	16.0	1.238	0.277	0.6320
15 minute summer	44	9.000	45	7.0	1.072	0.063	0.0989
15 minute summer	45	9.001	34	10.8	1.331	0.134	0.0470
15 minute summer	34	7.002	35	37.4	2.392	0.128	0.1535
15 minute summer	35	7.003	36	49.1	1.725	0.194	1.1097
15 minute summer	36	7.004	37	63.4	1.664	0.523	0.7390
15 minute summer	46	10.000	47	9.8	1.669	0.072	0.1533
15 minute summer	47	10.001	48	17.8	1.161	0.118	0.5613
15 minute summer	48	10.002	49	33.4	1.346	0.624	0.8371
15 minute summer	49	10.003	37	41.8	1.805	0.545	0.1841
15 minute summer	37	7.005	38	106.3	3.430	0.150	1.2039
15 minute summer	38	7.006	39	114.3	2.712	0.113	1.5639
15 minute summer	39	7.007	40	111.2	1.476	0.460	3.6062
15 minute summer	52	12.000	53	19.4	1.783	0.241	0.1491
15 minute summer	53	12.001	54	23.7	2.014	0.165	0.4360
15 minute summer	54	12.002	40	40.1	2.758	0.321	0.4645
15 minute summer	55	13.000	56	3.0	0.604	0.024	0.1307
15 minute summer	56	13.001	57	15.2	1.750	0.140	0.1326
15 minute summer	57	13.002	58	15.0	1.337	0.178	0.4007
15 minute summer	58	13.003	40	24.2	1.884	0.269	0.2689
15 minute summer	40	7.008	41	189.4	2.670	0.127	0.4626
15 minute summer	41	7.009	42	189.4	2.026	0.301	1.1566
480 minute summer	42	7.010	20	85.4	1.386	0.109	1.1328
480 minute summer	20	1.019	21	15.5	0.267	0.032	4.8412
480 minute summer	21	1.020	22	13.6	0.182	0.028	4.0822

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute summer	22	392	33.700	0.590	13.6	1.0422	0.0000	OK
15 minute summer	23	1	33.100	0.000	12.1	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)
480 minute summer	22	Hydro-Brake®	23	12.5			

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	48.812	0.063	17.5	0.1221	0.0000	OK
15 minute summer	24	10	48.392	0.130	25.3	0.2820	0.0000	OK
15 minute summer	2	11	48.207	0.107	45.3	0.1597	0.0000	OK
15 minute summer	25	10	46.341	0.066	9.7	0.1151	0.0000	OK
15 minute summer	3	10	46.093	0.118	96.5	0.2879	0.0000	OK
15 minute summer	26	10	46.081	0.040	8.3	0.0667	0.0000	OK
15 minute summer	27	10	44.801	0.076	27.2	0.1444	0.0000	OK
15 minute summer	28	10	44.617	0.167	51.0	0.3306	0.0000	OK
15 minute summer	30	10	46.261	0.061	27.3	0.1302	0.0000	OK
15 minute summer	29	11	44.452	0.252	97.6	0.4303	0.0000	OK
15 minute summer	4	11	44.298	0.298	220.0	0.5311	0.0000	OK
15 minute summer	5	11	43.976	0.376	263.2	0.7755	0.0000	SURCHARGED
15 minute summer	31	10	44.080	0.077	20.4	0.1559	0.0000	OK
15 minute summer	6	11	43.307	0.307	299.0	0.5930	0.0000	OK
15 minute summer	7	11	42.953	0.197	318.2	0.3715	0.0000	OK
15 minute summer	8	11	40.952	0.315	351.6	0.6348	0.0000	OK
15 minute summer	9	11	40.198	0.246	363.9	0.4123	0.0000	OK
15 minute summer	10	11	39.402	0.330	389.0	0.6374	0.0000	OK
15 minute summer	11	11	38.865	0.243	430.8	0.5676	0.0000	OK
15 minute summer	12	11	37.211	0.300	444.5	0.5310	0.0000	OK
15 minute summer	13	11	36.316	0.290	482.8	4.5327	0.0000	OK
15 minute summer	50	12	35.915	0.265	44.4	5.7586	0.0000	OK
15 minute summer	51	13	35.908	0.333	60.9	9.1162	0.0000	SURCHARGED
15 minute summer	14	12	35.872	0.600	480.2	1.1170	0.0000	SURCHARGED
15 minute summer	15	12	35.495	0.310	482.6	0.5962	0.0000	OK
15 minute winter	16	6	34.971	0.471	466.5	0.8326	0.0000	OK
30 minute summer	17	22	34.591	0.391	464.2	102.1647	0.0000	OK
30 minute summer	18	22	34.313	0.315	386.3	0.4503	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	1	1.000	2	17.4	1.300	0.173	0.2402
15 minute summer	24	2.000	2	25.0	1.183	0.592	0.5157
15 minute summer	2	1.001	3	44.8	2.454	0.441	0.9917
15 minute summer	25	3.000	3	9.5	1.000	0.179	0.2056
15 minute summer	3	1.002	4	96.1	2.766	0.333	1.1673
15 minute summer	26	4.000	27	8.2	1.756	0.066	0.1031
15 minute summer	27	4.001	28	27.1	1.011	0.131	0.2171
15 minute summer	28	4.002	29	50.0	0.966	0.614	2.3866
15 minute summer	30	5.000	29	27.2	2.142	0.162	0.3902
15 minute summer	29	4.003	4	96.3	1.646	0.866	0.7448
15 minute summer	4	1.003	5	220.0	2.192	0.735	1.8329
15 minute summer	5	1.004	6	259.6	2.593	0.961	2.8984
15 minute summer	31	6.000	6	20.4	1.651	0.246	0.3812
15 minute summer	6	1.005	7	300.6	3.293	0.518	0.6934
15 minute summer	7	1.006	8	319.1	3.436	0.410	3.4022
15 minute summer	8	1.007	9	353.7	3.283	0.671	2.4394
15 minute summer	9	1.008	10	364.4	3.008	0.387	2.8461
15 minute summer	10	1.009	11	389.5	3.232	0.565	2.6918
15 minute summer	11	1.010	12	431.0	3.826	0.411	4.1440
15 minute summer	12	1.011	13	444.3	3.599	0.516	3.5237
15 minute summer	13	1.012	14	475.6	2.493	0.342	1.5643
15 minute summer	50	11.000	51	35.2	0.704	0.456	1.0517
15 minute summer	51	11.001	14	81.4	1.270	1.063	1.1501
15 minute summer	14	1.013	15	477.6	2.536	1.491	3.4530
15 minute summer	15	1.014	16	482.7	3.373	0.489	2.3851
15 minute winter	16	1.015	17	466.1	4.004	0.370	0.6824
30 minute summer	17	1.016	18	386.3	2.504	0.723	2.5576
30 minute summer	18	1.017	19	386.0	2.502	0.421	1.7550

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	19	480	34.235	0.635	62.2	0.9081	0.0000	SURCHARGED
15 minute summer	32	10	44.625	0.064	23.4	0.1321	0.0000	OK
15 minute summer	43	10	43.118	0.090	12.7	0.1624	0.0000	OK
15 minute summer	33	11	43.097	0.145	42.1	0.2257	0.0000	OK
15 minute summer	44	10	43.214	0.061	18.0	0.1194	0.0000	OK
15 minute summer	45	10	42.594	0.106	28.1	0.1830	0.0000	OK
15 minute summer	34	10	42.407	0.132	96.4	0.2760	0.0000	OK
15 minute summer	35	10	41.749	0.149	127.3	0.3123	0.0000	OK
15 minute summer	36	11	40.235	0.609	164.0	1.4652	0.0000	SURCHARGED
15 minute summer	46	10	44.827	0.065	25.3	0.1454	0.0000	OK
15 minute summer	47	10	43.084	0.084	46.1	0.1651	0.0000	OK
15 minute summer	48	12	40.961	0.961	87.2	2.3106	0.0000	SURCHARGED
15 minute summer	49	11	40.105	0.463	96.4	1.0013	0.0000	SURCHARGED
15 minute summer	37	11	39.452	0.207	260.1	0.3781	0.0000	OK
15 minute summer	38	11	37.559	0.159	280.2	0.3589	0.0000	OK
15 minute summer	39	12	34.959	0.515	283.1	8.9656	0.0000	SURCHARGED
15 minute summer	52	11	39.487	0.144	52.1	2.9098	0.0000	OK
15 minute summer	53	11	39.118	0.100	59.7	0.1774	0.0000	OK
15 minute summer	54	11	36.389	0.165	101.4	0.3957	0.0000	OK
15 minute summer	55	10	38.038	0.038	7.8	0.0631	0.0000	OK
15 minute summer	56	10	36.702	0.098	39.3	0.2188	0.0000	OK
15 minute summer	57	10	36.054	0.107	39.0	0.1525	0.0000	OK
15 minute summer	58	10	35.174	0.149	63.0	0.3352	0.0000	OK
15 minute summer	40	11	34.390	0.290	472.9	0.7696	0.0000	OK
600 minute winter	41	600	34.249	0.749	48.0	1.3232	0.0000	SURCHARGED
480 minute winter	42	496	34.247	0.947	59.6	1.6734	0.0000	SURCHARGED
480 minute winter	20	480	34.235	1.085	198.6	1042.2690	0.0000	SURCHARGED
480 minute winter	21	480	34.235	1.107	14.3	1.9554	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
480 minute winter	19	1.018	20	60.7	0.705	0.130	10.4510
15 minute summer	32	7.000	33	23.3	1.390	0.178	0.4665
15 minute summer	43	8.000	33	12.5	0.618	0.314	0.2680
15 minute summer	33	7.001	34	41.3	1.561	0.716	1.2949
15 minute summer	44	9.000	45	17.9	1.335	0.163	0.2036
15 minute summer	45	9.001	34	27.9	1.673	0.346	0.0963
15 minute summer	34	7.002	35	96.1	2.986	0.328	0.3166
15 minute summer	35	7.003	36	126.5	2.100	0.500	2.0197
15 minute summer	36	7.004	37	162.8	2.313	1.342	1.3514
15 minute summer	46	10.000	47	25.2	2.183	0.185	0.3001
15 minute summer	47	10.001	48	45.8	1.456	0.303	0.9556
15 minute summer	48	10.002	49	76.6	1.927	1.429	1.3394
15 minute summer	49	10.003	37	95.1	2.391	1.240	0.3129
15 minute summer	37	7.005	38	259.8	4.301	0.367	2.3438
15 minute summer	38	7.006	39	279.8	3.192	0.276	3.1505
15 minute summer	39	7.007	40	277.3	1.774	1.146	7.1183
15 minute summer	52	12.000	53	48.6	2.213	0.604	0.2990
15 minute summer	53	12.001	54	59.6	2.474	0.414	0.8897
15 minute summer	54	12.002	40	101.5	3.387	0.812	0.9558
15 minute summer	55	13.000	56	7.7	0.764	0.063	0.2664
15 minute summer	56	13.001	57	39.0	2.224	0.361	0.2686
15 minute summer	57	13.002	58	38.7	1.663	0.461	0.8250
15 minute summer	58	13.003	40	62.3	2.347	0.690	0.5543
15 minute summer	40	7.008	41	473.7	2.871	0.318	1.0379
600 minute winter	41	7.009	42	57.7	1.435	0.092	2.5660
480 minute winter	42	7.010	20	140.1	1.519	0.179	1.2439
480 minute winter	20	1.019	21	14.3	0.278	0.029	6.0341
480 minute winter	21	1.020	22	13.3	0.194	0.027	4.9104

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	22	480	34.234	1.124	13.3	1.9869	0.0000	SURCHARGED
15 minute summer	23	1	33.100	0.000	12.5	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)
480 minute winter	22	Hydro-Brake®	23	12.5			

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	48.836	0.087	32.1	0.1679	0.0000	OK
15 minute summer	24	11	48.478	0.216	46.4	0.4677	0.0000	OK
15 minute summer	2	10	48.258	0.158	82.3	0.2359	0.0000	OK
15 minute summer	25	12	46.492	0.217	17.9	0.3753	0.0000	OK
15 minute summer	3	12	46.445	0.470	177.3	1.1446	0.0000	SURCHARGED
15 minute summer	26	12	46.303	0.262	15.2	0.4383	0.0000	SURCHARGED
15 minute summer	27	12	46.276	1.551	49.9	2.9321	0.0000	FLOOD RISK
15 minute summer	28	12	46.256	1.806	84.5	3.5650	1.2102	FLOOD
15 minute summer	30	11	46.322	0.122	50.0	0.2613	0.0000	OK
15 minute summer	29	12	46.059	1.859	141.3	3.1787	0.0000	SURCHARGED
15 minute summer	4	12	45.762	1.762	331.7	3.1407	0.0000	SURCHARGED
15 minute summer	5	11	45.024	1.424	403.7	2.9342	0.0000	SURCHARGED
15 minute summer	31	10	44.108	0.105	37.5	0.2115	0.0000	OK
15 minute summer	6	11	43.506	0.506	474.4	0.9788	0.0000	SURCHARGED
15 minute summer	7	11	43.046	0.290	505.5	0.5465	0.0000	OK
15 minute summer	8	11	41.470	0.833	563.4	1.6806	0.0000	SURCHARGED
15 minute summer	9	11	40.300	0.348	577.2	0.5841	0.0000	OK
15 minute summer	10	11	39.561	0.489	620.6	0.9441	0.0000	OK
15 minute summer	11	12	39.023	0.401	689.4	0.9372	0.0000	OK
15 minute summer	12	12	38.085	1.174	701.5	2.0788	0.0000	SURCHARGED
15 minute summer	13	13	37.320	1.294	723.8	12.1126	0.0000	FLOOD RISK
15 minute summer	50	13	37.000	1.350	75.9	14.7165	0.0000	FLOOD RISK
15 minute summer	51	13	36.971	1.396	140.5	21.3625	0.0000	FLOOD RISK
15 minute summer	14	13	36.857	1.585	800.7	2.9509	0.0000	SURCHARGED
15 minute summer	15	13	35.990	0.805	802.8	1.5494	0.0000	SURCHARGED
30 minute summer	16	21	35.222	0.722	787.3	1.2762	0.0000	SURCHARGED
30 minute summer	17	25	34.921	0.721	785.3	200.4498	0.0000	SURCHARGED
960 minute winter	18	1020	34.797	0.799	132.6	1.1438	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	1	1.000	2	32.0	1.497	0.317	0.3823
15 minute summer	24	2.000	2	45.5	1.321	1.076	0.8379
15 minute summer	2	1.001	3	82.0	2.757	0.809	1.8581
15 minute summer	25	3.000	3	20.1	1.052	0.379	0.8515
15 minute summer	3	1.002	4	166.3	2.761	0.577	2.0092
15 minute summer	26	4.000	27	20.3	1.898	0.164	0.8767
15 minute summer	27	4.001	28	60.0	1.075	0.289	0.5607
15 minute summer	28	4.002	29	92.5	1.313	1.135	3.2534
15 minute summer	30	5.000	29	48.0	2.145	0.285	0.5763
15 minute summer	29	4.003	4	154.3	2.191	1.388	0.8795
15 minute summer	4	1.003	5	335.6	3.043	1.121	1.9803
15 minute summer	5	1.004	6	401.7	3.642	1.487	3.1896
15 minute summer	31	6.000	6	37.3	1.766	0.449	0.8856
15 minute summer	6	1.005	7	473.1	3.466	0.816	1.0157
15 minute summer	7	1.006	8	503.9	3.481	0.647	4.8966
15 minute summer	8	1.007	9	558.5	3.526	1.059	3.5914
15 minute summer	9	1.008	10	575.5	3.203	0.612	4.2508
15 minute summer	10	1.009	11	613.6	3.430	0.891	4.3233
15 minute summer	11	1.010	12	676.8	4.008	0.645	7.2343
15 minute summer	12	1.011	13	665.7	3.582	0.774	6.1003
15 minute summer	13	1.012	14	713.1	3.301	0.513	1.9990
15 minute summer	50	11.000	51	58.9	0.837	0.764	1.0874
15 minute summer	51	11.001	14	118.3	1.684	1.547	1.1501
15 minute summer	14	1.013	15	793.7	3.674	2.478	4.2805
15 minute summer	15	1.014	16	800.9	3.708	0.812	3.5920
30 minute summer	16	1.015	17	785.3	3.635	0.624	0.9678
30 minute summer	17	1.016	18	472.2	2.509	0.883	3.5933
960 minute winter	18	1.017	19	112.9	1.657	0.123	2.4142

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	19	930	34.769	1.168	112.9	1.6721	0.0000	FLOOD RISK
15 minute summer	32	10	44.649	0.088	42.9	0.1818	0.0000	OK
15 minute summer	43	12	43.691	0.663	23.2	1.1907	0.0000	SURCHARGED
15 minute summer	33	12	43.668	0.716	70.4	1.1142	0.0000	SURCHARGED
15 minute summer	44	10	43.237	0.084	33.0	0.1638	0.0000	OK
15 minute summer	45	12	42.956	0.468	51.7	0.8070	0.0000	SURCHARGED
15 minute summer	34	12	42.877	0.602	156.9	1.2613	0.0000	SURCHARGED
15 minute summer	35	12	42.569	0.969	209.6	2.0371	0.0000	SURCHARGED
15 minute summer	36	11	41.106	1.480	262.3	3.5588	0.0000	FLOOD RISK
15 minute summer	46	10	44.852	0.090	46.4	0.2002	0.0000	OK
15 minute summer	47	12	43.468	0.468	84.6	0.9153	0.0000	SURCHARGED
15 minute summer	48	11	42.664	2.664	150.8	6.4069	2.6462	FLOOD
15 minute summer	49	11	40.756	1.114	152.4	2.4098	0.0000	FLOOD RISK
15 minute summer	37	11	39.515	0.270	416.6	0.4942	0.0000	OK
15 minute summer	38	12	37.659	0.259	454.5	0.5842	0.0000	OK
15 minute summer	39	12	36.316	1.872	453.9	11.5881	0.0000	FLOOD RISK
15 minute summer	52	12	39.580	0.237	95.5	7.4514	0.0000	SURCHARGED
15 minute summer	53	12	39.204	0.186	95.7	0.3295	0.0000	OK
15 minute summer	54	12	38.091	1.867	172.6	4.4733	0.5493	FLOOD
15 minute summer	55	10	38.052	0.052	14.3	0.0851	0.0000	OK
15 minute summer	56	12	36.785	0.181	72.2	0.4040	0.0000	OK
15 minute summer	57	12	36.572	0.625	72.2	0.8945	0.0000	SURCHARGED
15 minute summer	58	12	36.036	1.011	106.3	2.2732	0.0000	FLOOD RISK
15 minute summer	40	12	35.167	1.067	771.5	2.8343	0.0000	SURCHARGED
960 minute winter	41	945	34.770	1.270	59.2	2.2434	0.0000	SURCHARGED
960 minute winter	42	930	34.769	1.469	70.7	2.5951	0.0000	FLOOD RISK
960 minute winter	20	930	34.768	1.618	129.4	2011.1830	0.0000	FLOOD RISK
960 minute winter	21	930	34.767	1.639	13.5	2.8970	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
960 minute winter	19	1.018	20	76.0	0.646	0.163	10.4510
15 minute summer	32	7.000	33	42.7	1.562	0.328	0.7001
15 minute summer	43	8.000	33	21.3	0.664	0.534	0.5114
15 minute summer	33	7.001	34	65.7	1.652	1.139	1.9476
15 minute summer	44	9.000	45	32.9	1.498	0.299	0.3973
15 minute summer	45	9.001	34	47.5	1.868	0.589	0.2295
15 minute summer	34	7.002	35	155.1	3.035	0.529	0.6904
15 minute summer	35	7.003	36	199.9	2.839	0.790	2.7035
15 minute summer	36	7.004	37	260.5	3.700	2.146	1.3514
15 minute summer	46	10.000	47	46.2	2.415	0.339	0.7023
15 minute summer	47	10.001	48	74.9	2.100	0.495	1.4242
15 minute summer	48	10.002	49	115.9	2.915	2.163	1.3394
15 minute summer	49	10.003	37	151.8	3.817	1.979	0.3146
15 minute summer	37	7.005	38	417.0	4.551	0.589	3.7042
15 minute summer	38	7.006	39	447.9	3.534	0.441	3.8215
15 minute summer	39	7.007	40	449.7	2.839	1.859	7.5829
15 minute summer	52	12.000	53	74.8	2.305	0.929	0.5112
15 minute summer	53	12.001	54	92.4	2.537	0.641	1.3795
15 minute summer	54	12.002	40	144.6	3.636	1.157	1.2687
15 minute summer	55	13.000	56	14.2	0.866	0.116	0.5078
15 minute summer	56	13.001	57	72.2	2.488	0.667	0.5662
15 minute summer	57	13.002	58	63.2	1.748	0.752	1.4132
15 minute summer	58	13.003	40	94.6	2.378	1.048	0.8309
15 minute summer	40	7.008	41	772.2	3.575	0.519	1.3859
960 minute winter	41	7.009	42	70.7	1.235	0.112	2.5660
960 minute winter	42	7.010	20	105.4	1.340	0.134	1.2439
960 minute winter	20	1.019	21	13.5	0.279	0.027	6.0341
960 minute winter	21	1.020	22	14.8	0.184	0.030	4.9104

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	22	945	34.768	1.658	14.8	2.9296	0.0000	FLOOD RISK
15 minute summer	23	1	33.100	0.000	12.5	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)
960 minute winter	22	Hydro-Brake®	23	13.1			

Design Settings

Rainfall Methodology	FEH-13	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)
1	0.051	5.00	44.388	1350	505613.481	119375.106	1.425
15	0.052	5.00	43.801	1350	505578.112	119372.401	1.801
2	0.007	5.00	44.088	1350	505596.926	119373.706	2.390
3	0.094	5.00	42.338	1350	505594.836	119340.731	2.024
4	0.037	5.00	40.641	1350	505592.616	119306.350	2.516
5	0.099	5.00	40.389	1350	505565.078	119308.985	2.336
16	0.021	5.00	40.798	1350	505523.824	119338.866	1.425
17	0.020	5.00	39.532	1350	505476.589	119340.994	1.432
18	0.090	5.00	40.641	1350	505475.423	119313.554	3.841
19	0.081	5.00	39.700	1350	505508.620	119311.914	2.100
6	0.085	5.00	40.340	1350	505522.821	119311.201	3.140
7	0.057	5.00	37.585	1500	505521.511	119263.766	3.085
20	0.021	5.00	37.442	1350	505474.320	119284.552	1.742
21	0.043	5.00	36.801	1200	505473.623	119265.847	1.601
22	0.000	5.00	36.114	1200	505475.559	119252.787	1.514
23	0.000	5.00	35.982	1200	505493.545	119251.394	1.782
24	0.000	5.00	35.417	1200	505499.124	119242.739	1.617
8	0.009	5.00	35.897	1500	505522.350	119243.609	2.847
9	0.000	5.00	33.900	1500	505517.881	119222.078	2.800
10	0.000	5.00	33.000	1500	505511.949	119208.210	2.000
11	0.000	5.00	32.500	1500	505501.127	119190.135	1.600
12	0.000	5.00	32.500	1500	505510.367	119174.044	1.630
13	0.000	5.00	32.500	1500	505518.057	119170.282	1.650
14	0.000	5.00	31.982	1500	505535.198	119155.009	1.182

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	Flow (l/s)	Pro Velocity (m/s)
1.000	1	2	16.614	0.600	Colebrook-White	42.963	41.773	1.190	14.0	225	5.16	50.0	9.2	2.018
2.000	15	2	18.859	0.600	Colebrook-White	42.000	41.773	0.227	83.1	225	5.19	50.0	9.4	1.062
1.001	2	3	33.041	0.600	Colebrook-White	41.698	40.314	1.384	23.9	300	5.61	50.0	19.9	2.011
1.002	3	4	34.453	0.600	Colebrook-White	40.314	38.200	2.114	16.3	300	6.18	50.0	36.9	2.750
1.003	4	5	27.664	0.600	Colebrook-White	38.125	38.053	0.072	384.2	375	6.64	50.0	43.5	0.885
1.004	5	6	42.315	0.600	Colebrook-White	38.053	37.600	0.453	93.4	375	7.35	48.2	59.2	1.625
3.000	16	6	27.683	0.600	Colebrook-White	39.373	37.500	1.873	14.8	225	5.27	50.0	3.8	1.522
4.000	17	18	27.465	0.600	Colebrook-White	38.100	36.875	1.225	22.4	225	5.27	50.0	3.6	1.285

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	Flow (l/s)	Pro Velocity (m/s)
4.001	18	20	23.728	0.600	Colebrook-White	36.800	35.700	1.100	21.6	300	5.57	50.0	19.9	2.080
4.002	19	6	23.728	0.600	Colebrook-White	37.600	37.500	0.100	237.3	225	5.88	50.0	14.6	0.817
1.005	6	7	47.453	0.600	Colebrook-White	37.200	34.500	2.700	17.6	525	8.14	45.8	87.2	3.215
1.006	7	8	20.174	0.600	Colebrook-White	34.500	33.125	1.375	14.7	525	8.47	44.9	94.8	3.509
5.000	20	21	18.718	0.600	Colebrook-White	35.700	35.200	0.500	37.4	300	5.18	50.0	23.7	1.794
5.001	21	22	13.203	0.600	Colebrook-White	35.200	34.600	0.600	22.0	300	5.35	50.0	31.4	2.354
5.002	22	23	18.040	0.600	Colebrook-White	34.600	34.200	0.400	45.1	300	5.58	50.0	31.4	1.820
5.003	23	24	10.297	0.600	Colebrook-White	34.200	33.800	0.400	25.7	300	5.71	50.0	31.4	2.224
5.004	24	8	23.242	0.600	Colebrook-White	33.800	33.350	0.450	51.6	300	5.92	50.0	31.4	1.730
1.007	8	9	21.990	0.600	Colebrook-White	33.050	31.100	1.950	11.3	600	8.48	44.9	124.5	4.112
1.008	9	10	15.083	0.600	Colebrook-White	31.100	31.000	0.100	150.8	600	8.55	44.7	123.9	1.606
1.009	10	11	21.067	0.600	Colebrook-White	31.000	30.900	0.100	210.7	600	8.77	44.1	122.2	1.415
1.010	11	12	18.555	0.600	Colebrook-White	30.900	30.870	0.030	618.5	600	9.08	43.3	120.0	0.940
1.011	12	13	8.561	0.600	Colebrook-White	30.870	30.850	0.020	428.1	600	9.22	43.0	119.2	1.078
1.012	13	14	27.279	0.600	Colebrook-White	30.850	30.800	0.050	545.6	600	9.73	41.8	115.9	0.977

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	16.614	14.0	225	Circular_Default Sewer Type	44.388	42.963	1.200	44.088	41.773	2.090
2.000	18.859	83.1	225	Circular_Default Sewer Type	43.801	42.000	1.576	44.088	41.773	2.090
1.001	33.041	23.9	300	Circular_Default Sewer Type	44.088	41.698	2.090	42.338	40.314	1.724
1.002	34.453	16.3	300	Circular_Default Sewer Type	42.338	40.314	1.724	40.641	38.200	2.141
1.003	27.664	384.2	375	Circular_Default Sewer Type	40.641	38.125	2.141	40.389	38.053	1.961
1.004	42.315	93.4	375	Circular_Default Sewer Type	40.389	38.053	1.961	40.340	37.600	2.365
3.000	27.683	14.8	225	Circular_Default Sewer Type	40.798	39.373	1.200	40.340	37.500	2.615
4.000	27.465	22.4	225	Circular_Default Sewer Type	39.532	38.100	1.207	40.641	36.875	3.541
4.001	23.728	21.6	300	Circular_Default Sewer Type	40.641	36.800	3.541	37.442	35.700	1.442

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1350	Manhole	Adoptable	2	1350	Manhole	Adoptable
2.000	15	1350	Manhole	Adoptable	2	1350	Manhole	Adoptable
1.001	2	1350	Manhole	Adoptable	3	1350	Manhole	Adoptable
1.002	3	1350	Manhole	Adoptable	4	1350	Manhole	Adoptable
1.003	4	1350	Manhole	Adoptable	5	1350	Manhole	Adoptable
1.004	5	1350	Manhole	Adoptable	6	1350	Manhole	Adoptable
3.000	16	1350	Manhole	Adoptable	6	1350	Manhole	Adoptable
4.000	17	1350	Manhole	Adoptable	18	1350	Manhole	Adoptable
4.001	18	1350	Manhole	Adoptable	20	1350	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)
4.002	23.728	237.3	225	Circular_Default Sewer Type	39.700	37.600	1.875	40.340	37.500	2.615
1.005	47.453	17.6	525	Circular_Default Sewer Type	40.340	37.200	2.615	37.585	34.500	2.560
1.006	20.174	14.7	525	Circular_Default Sewer Type	37.585	34.500	2.560	35.897	33.125	2.247
5.000	18.718	37.4	300	Circular_Default Sewer Type	37.442	35.700	1.442	36.801	35.200	1.301
5.001	13.203	22.0	300	Circular_Default Sewer Type	36.801	35.200	1.301	36.114	34.600	1.214
5.002	18.040	45.1	300	Circular_Default Sewer Type	36.114	34.600	1.214	35.982	34.200	1.482
5.003	10.297	25.7	300	Circular_Default Sewer Type	35.982	34.200	1.482	35.417	33.800	1.317
5.004	23.242	51.6	300	Circular_Default Sewer Type	35.417	33.800	1.317	35.897	33.350	2.247
1.007	21.990	11.3	600	Circular_Default Sewer Type	35.897	33.050	2.247	33.900	31.100	2.200
1.008	15.083	150.8	600	Circular_Default Sewer Type	33.900	31.100	2.200	33.000	31.000	1.400
1.009	21.067	210.7	600	Circular_Default Sewer Type	33.000	31.000	1.400	32.500	30.900	1.000
1.010	18.555	618.5	600	Circular_Default Sewer Type	32.500	30.900	1.000	32.500	30.870	1.030
1.011	8.561	428.1	600	Circular_Default Sewer Type	32.500	30.870	1.030	32.500	30.850	1.050
1.012	27.279	545.6	600	Circular_Default Sewer Type	32.500	30.850	1.050	31.982	30.800	0.582

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
4.002	19	1350	Manhole	Adoptable	6	1350	Manhole	Adoptable
1.005	6	1350	Manhole	Adoptable	7	1500	Manhole	Adoptable
1.006	7	1500	Manhole	Adoptable	8	1500	Manhole	Adoptable
5.000	20	1350	Manhole	Adoptable	21	1200	Manhole	Adoptable
5.001	21	1200	Manhole	Adoptable	22	1200	Manhole	Adoptable
5.002	22	1200	Manhole	Adoptable	23	1200	Manhole	Adoptable
5.003	23	1200	Manhole	Adoptable	24	1200	Manhole	Adoptable
5.004	24	1200	Manhole	Adoptable	8	1500	Manhole	Adoptable
1.007	8	1500	Manhole	Adoptable	9	1500	Manhole	Adoptable
1.008	9	1500	Manhole	Adoptable	10	1500	Manhole	Adoptable
1.009	10	1500	Manhole	Adoptable	11	1500	Manhole	Adoptable
1.010	11	1500	Manhole	Adoptable	12	1500	Manhole	Adoptable
1.011	12	1500	Manhole	Adoptable	13	1500	Manhole	Adoptable
1.012	13	1500	Manhole	Adoptable	14	1500	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FEH-13	Drain Down Time (mins)	240	100 year (l/s)	19.4
Summer CV	1.000	Additional Storage (m³/ha)	20.0	Check Discharge Volume	✓
Winter CV	1.000	Check Discharge Rate(s)	✓	100 year 360 minute (m³)	
Analysis Speed	Normal	2 year (l/s)	6.1		
Skip Steady State	✓	30 year (l/s)	13.8		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	45	0	0
30	0	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	SPR	0.10	Betterment (%)	0
Greenfield Method	IH124	Region	1	QBar	1.8
Positively Drained Area (ha)	8.000	Growth Factor 2 year	0.90	Q 2 year (l/s)	1.6
SAAR (mm)	900	Growth Factor 30 year	1.95	Q 30 year (l/s)	3.5
Soil Index	1	Growth Factor 100 year	2.48	Q 100 year (l/s)	4.5

Pre-development Discharge Volume

Site Makeup	Greenfield	SPR	0.10	Storm Duration (mins)	360
Greenfield Method	FSR/FEH	CWI		Betterment (%)	0
Positively Drained Area (ha)	8.000	Return Period (years)	100	PR	
Soil Index	1	Climate Change (%)	0	Runoff Volume (m^3)	

Node 13 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 11 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.900
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	177.0	0.0	1.100	734.0	0.0	1.201	0.1	0.0
0.100	415.0	0.0	1.200	995.0	0.0			

Node 5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	38.053	Slope (1:X)	80.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	3	Depth (m)	0.400
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	1.00	Length (m)	25.000		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	116.144	32.865	2 year 2880 minute winter	2.743	1.094
2 year 15 minute winter	81.505	32.865	2 year 4320 minute summer	3.193	0.835
2 year 30 minute summer	76.046	21.518	2 year 4320 minute winter	2.103	0.835
2 year 30 minute winter	53.366	21.518	2 year 5760 minute summer	2.728	0.698
2 year 60 minute summer	51.462	13.600	2 year 5760 minute winter	1.766	0.698
2 year 60 minute winter	34.190	13.600	2 year 7200 minute summer	2.412	0.615
2 year 120 minute summer	35.529	9.389	2 year 7200 minute winter	1.557	0.615
2 year 120 minute winter	23.604	9.389	2 year 8640 minute summer	2.193	0.559
2 year 180 minute summer	28.732	7.394	2 year 8640 minute winter	1.415	0.559
2 year 180 minute winter	18.677	7.394	2 year 10080 minute summer	2.037	0.520
2 year 240 minute summer	23.420	6.189	2 year 10080 minute winter	1.315	0.520
2 year 240 minute winter	15.560	6.189	30 year 15 minute summer	298.112	84.355
2 year 360 minute summer	18.509	4.763	30 year 15 minute winter	209.201	84.355
2 year 360 minute winter	12.031	4.763	30 year 30 minute summer	198.287	56.108
2 year 480 minute summer	14.851	3.925	30 year 30 minute winter	139.149	56.108
2 year 480 minute winter	9.867	3.925	30 year 60 minute summer	135.115	35.707
2 year 600 minute summer	12.301	3.365	30 year 60 minute winter	89.767	35.707
2 year 600 minute winter	8.405	3.365	30 year 120 minute summer	80.945	21.391
2 year 720 minute summer	11.046	2.960	30 year 120 minute winter	53.778	21.391
2 year 720 minute winter	7.423	2.960	30 year 180 minute summer	61.384	15.796
2 year 960 minute summer	9.150	2.409	30 year 180 minute winter	39.901	15.796
2 year 960 minute winter	6.061	2.409	30 year 240 minute summer	48.131	12.720
2 year 1440 minute summer	6.695	1.794	30 year 240 minute winter	31.977	12.720
2 year 1440 minute winter	4.500	1.794	30 year 360 minute summer	36.346	9.353
2 year 2160 minute summer	4.844	1.339	30 year 360 minute winter	23.626	9.353
2 year 2160 minute winter	3.338	1.339	30 year 480 minute summer	28.382	7.500
2 year 2880 minute summer	4.081	1.094	30 year 480 minute winter	18.856	7.500

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 600 minute summer	23.086	6.315	100 year +45% CC 180 minute summer	110.822	28.518
30 year 600 minute winter	15.774	6.315	100 year +45% CC 180 minute winter	72.037	28.518
30 year 720 minute summer	20.462	5.484	100 year +45% CC 240 minute summer	86.398	22.833
30 year 720 minute winter	13.752	5.484	100 year +45% CC 240 minute winter	57.401	22.833
30 year 960 minute summer	16.671	4.390	100 year +45% CC 360 minute summer	64.865	16.692
30 year 960 minute winter	11.043	4.390	100 year +45% CC 360 minute winter	42.164	16.692
30 year 1440 minute summer	11.951	3.203	100 year +45% CC 480 minute summer	50.544	13.357
30 year 1440 minute winter	8.032	3.203	100 year +45% CC 480 minute winter	33.580	13.357
30 year 2160 minute summer	8.505	2.351	100 year +45% CC 600 minute summer	41.086	11.238
30 year 2160 minute winter	5.860	2.351	100 year +45% CC 600 minute winter	28.073	11.238
30 year 2880 minute summer	7.078	1.897	100 year +45% CC 720 minute summer	36.419	9.761
30 year 2880 minute winter	4.757	1.897	100 year +45% CC 720 minute winter	24.476	9.761
30 year 4320 minute summer	5.406	1.413	100 year +45% CC 960 minute summer	29.709	7.823
30 year 4320 minute winter	3.560	1.413	100 year +45% CC 960 minute winter	19.680	7.823
30 year 5760 minute summer	4.524	1.158	100 year +45% CC 1440 minute summer	21.359	5.724
30 year 5760 minute winter	2.928	1.158	100 year +45% CC 1440 minute winter	14.354	5.724
30 year 7200 minute summer	3.924	1.001	100 year +45% CC 2160 minute summer	15.208	4.203
30 year 7200 minute winter	2.533	1.001	100 year +45% CC 2160 minute winter	10.479	4.203
30 year 8640 minute summer	3.508	0.895	100 year +45% CC 2880 minute summer	12.625	3.384
30 year 8640 minute winter	2.264	0.895	100 year +45% CC 2880 minute winter	8.485	3.384
30 year 10080 minute summer	3.211	0.819	100 year +45% CC 4320 minute summer	9.543	2.495
30 year 10080 minute winter	2.072	0.819	100 year +45% CC 4320 minute winter	6.285	2.495
100 year +45% CC 15 minute summer	546.775	154.718	100 year +45% CC 5760 minute summer	7.901	2.023
100 year +45% CC 15 minute winter	383.702	154.718	100 year +45% CC 5760 minute winter	5.114	2.023
100 year +45% CC 30 minute summer	366.816	103.796	100 year +45% CC 7200 minute summer	6.777	1.729
100 year +45% CC 30 minute winter	257.415	103.796	100 year +45% CC 7200 minute winter	4.374	1.729
100 year +45% CC 60 minute summer	251.917	66.574	100 year +45% CC 8640 minute summer	5.997	1.530
100 year +45% CC 60 minute winter	167.367	66.574	100 year +45% CC 8640 minute winter	3.870	1.530
100 year +45% CC 120 minute summer	147.617	39.011	100 year +45% CC 10080 minute summer	5.437	1.387
100 year +45% CC 120 minute winter	98.073	39.011	100 year +45% CC 10080 minute winter	3.509	1.387

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.07%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	43.004	0.041	9.7	0.0879	0.0000	OK
15 minute summer	15	10	42.065	0.065	9.9	0.1306	0.0000	OK
15 minute summer	2	10	41.758	0.060	20.6	0.0900	0.0000	OK
15 minute summer	3	10	40.389	0.075	38.3	0.1761	0.0000	OK
15 minute summer	4	11	38.294	0.169	44.9	0.2910	0.0000	OK
15 minute summer	5	12	38.181	0.128	62.8	6.8421	0.0000	OK
15 minute summer	16	10	39.400	0.027	4.0	0.0459	0.0000	OK
15 minute summer	17	10	38.129	0.029	3.8	0.0489	0.0000	OK
15 minute summer	18	10	36.859	0.059	20.8	0.1125	0.0000	OK
15 minute summer	19	10	37.710	0.110	15.4	0.2414	0.0000	OK
15 minute summer	6	12	37.292	0.092	78.4	0.1819	0.0000	OK
15 minute summer	7	12	34.598	0.098	88.0	0.2091	0.0000	OK
15 minute summer	20	10	35.777	0.077	24.7	0.1289	0.0000	OK
15 minute summer	21	10	35.276	0.076	32.7	0.1270	0.0000	OK
15 minute summer	22	10	34.696	0.096	32.5	0.1086	0.0000	OK
15 minute summer	23	11	34.282	0.082	32.3	0.0922	0.0000	OK
15 minute summer	24	11	33.898	0.098	32.5	0.1104	0.0000	OK
15 minute summer	8	11	33.147	0.097	121.3	0.1775	0.0000	OK
15 minute summer	9	11	31.319	0.219	121.1	0.3864	0.0000	OK
15 minute winter	10	8	31.273	0.273	114.4	0.4829	0.0000	OK
480 minute summer	11	352	31.220	0.320	31.3	129.1193	0.0000	OK
480 minute summer	12	344	31.220	0.350	5.8	0.6177	0.0000	OK
480 minute summer	13	360	31.220	0.370	5.3	0.6530	0.0000	OK
15 minute summer	14	1	30.800	0.000	4.8	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)
15 minute summer	1	1.000	2	9.6	1.993	0.069	0.0802
15 minute summer	15	2.000	2	9.7	1.054	0.170	0.1740
15 minute summer	2	1.001	3	20.5	1.733	0.090	0.3922
15 minute summer	3	1.002	4	37.9	2.445	0.137	0.5557
15 minute summer	4	1.003	5	44.7	1.190	0.441	1.0924
15 minute summer	5	1.004	6	49.3	1.533	0.238	1.3621
15 minute summer	16	3.000	6	3.9	1.513	0.029	0.0720
15 minute summer	17	4.000	18	3.7	1.285	0.034	0.0795
15 minute summer	18	4.001	20	20.7	1.727	0.086	0.2859
15 minute summer	19	4.002	6	15.0	0.829	0.448	0.4313
15 minute summer	6	1.005	7	78.6	2.961	0.068	1.2600
15 minute summer	7	1.006	8	87.8	3.311	0.069	0.5351
15 minute summer	20	5.000	21	24.5	1.727	0.134	0.2652
15 minute summer	21	5.001	22	32.5	1.947	0.136	0.2208
15 minute summer	22	5.002	23	32.3	1.861	0.195	0.3140
15 minute summer	23	5.003	24	32.5	1.845	0.148	0.1819
15 minute summer	24	5.004	8	32.8	1.706	0.211	0.4463
15 minute summer	8	1.007	9	121.1	2.056	0.059	1.3442
15 minute summer	9	1.008	10	121.8	1.322	0.218	1.4166
15 minute winter	10	1.009	11	116.0	2.210	0.245	1.3308
480 minute summer	11	1.010	12	5.8	0.247	0.021	2.9975
480 minute summer	12	1.011	13	5.3	0.155	0.016	1.5087
480 minute summer	13	Hydro-Brake®	14	5.2			

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.07%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	43.030	0.067	24.8	0.1434	0.0000	OK
15 minute summer	15	10	42.111	0.111	25.3	0.2220	0.0000	OK
15 minute summer	2	10	41.795	0.097	53.1	0.1452	0.0000	OK
15 minute summer	3	10	40.436	0.122	98.6	0.2888	0.0000	OK
15 minute summer	4	11	38.416	0.291	116.0	0.5030	0.0000	OK
15 minute summer	5	12	38.270	0.217	162.6	19.3854	0.0000	OK
15 minute summer	16	10	39.415	0.042	10.2	0.0727	0.0000	OK
15 minute summer	17	10	38.146	0.046	9.7	0.0780	0.0000	OK
15 minute summer	18	10	36.895	0.095	53.4	0.1810	0.0000	OK
15 minute summer	19	11	37.827	0.227	39.4	0.5009	0.0000	SURCHARGED
15 minute summer	6	11	37.347	0.147	197.7	0.2905	0.0000	OK
15 minute summer	7	11	34.663	0.163	223.2	0.3477	0.0000	OK
15 minute summer	20	10	35.830	0.130	63.4	0.2173	0.0000	OK
15 minute summer	21	10	35.331	0.131	83.8	0.2191	0.0000	OK
15 minute summer	22	10	34.766	0.166	83.4	0.1882	0.0000	OK
15 minute summer	23	10	34.343	0.143	83.0	0.1621	0.0000	OK
15 minute summer	24	11	33.970	0.170	82.9	0.1922	0.0000	OK
15 minute summer	8	11	33.204	0.154	309.3	0.2819	0.0000	OK
480 minute winter	9	464	31.561	0.461	40.2	0.8151	0.0000	OK
480 minute winter	10	464	31.561	0.561	39.4	0.9918	0.0000	OK
480 minute winter	11	464	31.561	0.661	38.7	313.9581	0.0000	SURCHARGED
480 minute winter	12	464	31.561	0.691	6.1	1.2218	0.0000	SURCHARGED
480 minute winter	13	472	31.562	0.712	6.9	1.2581	0.0000	SURCHARGED
15 minute summer	14	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)
15 minute summer	1	1.000	2	24.7	2.587	0.176	0.1583
15 minute summer	15	2.000	2	25.0	1.345	0.438	0.3506
15 minute summer	2	1.001	3	52.8	2.261	0.231	0.7734
15 minute summer	3	1.002	4	98.0	2.480	0.354	1.3955
15 minute summer	4	1.003	5	114.5	1.573	1.129	2.1342
15 minute summer	5	1.004	6	121.4	1.916	0.586	2.6815
15 minute summer	16	3.000	6	10.1	1.996	0.074	0.1402
15 minute summer	17	4.000	18	9.6	1.696	0.087	0.1554
15 minute summer	18	4.001	20	53.2	2.204	0.221	0.5748
15 minute summer	19	4.002	6	38.2	1.044	1.137	0.8392
15 minute summer	6	1.005	7	197.0	3.727	0.170	2.5244
15 minute summer	7	1.006	8	221.3	4.200	0.174	1.0656
15 minute summer	20	5.000	21	62.9	2.137	0.345	0.5512
15 minute summer	21	5.001	22	83.4	2.393	0.351	0.4605
15 minute summer	22	5.002	23	83.0	2.267	0.500	0.6614
15 minute summer	23	5.003	24	82.9	2.235	0.377	0.3824
15 minute summer	24	5.004	8	83.8	2.149	0.541	0.9067
15 minute summer	8	1.007	9	309.0	2.536	0.150	2.7111
480 minute winter	9	1.008	10	39.4	0.926	0.070	3.8206
480 minute winter	10	1.009	11	38.7	0.909	0.082	5.8542
480 minute winter	11	1.010	12	6.1	0.273	0.022	5.2265
480 minute winter	12	1.011	13	6.9	0.196	0.021	2.4114
480 minute winter	13	Hydro-Brake®	14	5.2			

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.07%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	43.057	0.094	45.5	0.2015	0.0000	OK
15 minute summer	15	10	42.167	0.167	46.4	0.3355	0.0000	OK
15 minute summer	2	10	41.835	0.137	97.4	0.2037	0.0000	OK
15 minute summer	3	10	40.490	0.176	180.9	0.4163	0.0000	OK
15 minute summer	4	11	38.759	0.634	212.0	1.0939	0.0000	SURCHARGED
15 minute summer	5	13	38.374	0.321	295.6	41.7871	0.0000	OK
15 minute summer	16	10	39.431	0.058	18.8	0.0993	0.0000	OK
15 minute summer	17	10	38.162	0.062	17.9	0.1068	0.0000	OK
15 minute summer	18	10	36.934	0.134	98.1	0.2538	0.0000	OK
15 minute summer	19	11	38.221	0.621	72.3	1.3679	0.0000	SURCHARGED
15 minute summer	6	11	37.397	0.197	340.1	0.3890	0.0000	OK
15 minute summer	7	11	34.727	0.227	387.6	0.4841	0.0000	OK
15 minute summer	20	10	35.893	0.193	116.6	0.3225	0.0000	OK
15 minute summer	21	10	35.402	0.202	154.0	0.3374	0.0000	OK
15 minute summer	22	10	34.874	0.274	153.2	0.3098	0.0000	OK
15 minute summer	23	11	34.445	0.245	152.2	0.2766	0.0000	OK
15 minute summer	24	11	34.154	0.354	151.4	0.4008	0.0000	SURCHARGED
15 minute summer	8	11	33.255	0.205	541.4	0.3759	0.0000	OK
960 minute winter	9	930	32.086	0.986	41.7	1.7431	0.0000	SURCHARGED
960 minute winter	10	915	32.087	1.087	41.1	1.9202	0.0000	SURCHARGED
960 minute winter	11	930	32.086	1.186	40.9	679.3334	0.0000	SURCHARGED
960 minute winter	12	930	32.087	1.217	5.9	2.1510	0.0000	SURCHARGED
960 minute winter	13	945	32.086	1.236	6.7	2.1839	0.0000	SURCHARGED
15 minute summer	14	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)
15 minute summer	1	1.000	2	45.3	3.024	0.323	0.2487
15 minute summer	15	2.000	2	45.8	1.529	0.803	0.5651
15 minute summer	2	1.001	3	97.1	2.611	0.425	1.2275
15 minute summer	3	1.002	4	179.0	2.822	0.647	1.9550
15 minute summer	4	1.003	5	210.6	1.981	2.076	2.9133
15 minute summer	5	1.004	6	198.1	2.079	0.956	4.0318
15 minute summer	16	3.000	6	18.6	2.375	0.137	0.2172
15 minute summer	17	4.000	18	17.7	2.013	0.160	0.2415
15 minute summer	18	4.001	20	97.8	2.496	0.407	0.9275
15 minute summer	19	4.002	6	70.2	1.766	2.092	0.9289
15 minute summer	6	1.005	7	339.0	4.176	0.292	3.8710
15 minute summer	7	1.006	8	385.6	4.770	0.304	1.6324
15 minute summer	20	5.000	21	115.7	2.356	0.635	0.9209
15 minute summer	21	5.001	22	153.2	2.571	0.644	0.7790
15 minute summer	22	5.002	23	152.2	2.408	0.918	1.1618
15 minute summer	23	5.003	24	151.4	2.393	0.688	0.6792
15 minute summer	24	5.004	8	148.0	2.318	0.955	1.4941
15 minute summer	8	1.007	9	540.8	2.692	0.263	4.0337
960 minute winter	9	1.008	10	41.1	0.758	0.073	4.2485
960 minute winter	10	1.009	11	40.9	0.793	0.087	5.9341
960 minute winter	11	1.010	12	5.9	0.265	0.021	5.2265
960 minute winter	12	1.011	13	6.7	0.185	0.020	2.4114
960 minute winter	13	Hydro-Brake®	14	5.2			