

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	0.750	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		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.028	5.00	50.250		-18.540	-0.057	0.750
2	0.017	5.00	50.250		9.659	6.981	0.750
3	0.009	5.00	50.250		9.705	-5.439	0.750
4	0.000		50.250	450	9.659	-0.011	0.825
5	0.000		50.250		6.347	0.035	1.000
6	0.000		50.250	450	6.301	-3.645	1.050
7	0.000		50.250	450	1.563	-3.737	1.100
8	0.009	5.00	50.750	450	26.000	-5.916	0.700
9	0.000		50.500	450	26.036	-7.325	0.500
10	0.009	5.00	50.550	450	20.615	-5.916	0.700
11	0.000		50.450	450	20.608	-7.371	0.650
12	0.000		50.250	1200	1.563	-7.463	1.175
12_OUT			50.000	450	1.517	-14.180	1.000

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	5	24.887	0.600	49.500	49.250	0.250	99.5	100	5.54	46.5
2.000	2	4	6.992	0.600	49.500	49.425	0.075	93.2	150	5.11	47.8
3.000	3	4	5.428	0.600	49.500	49.425	0.075	72.4	150	5.08	48.0
2.001	4	5	3.312	0.600	49.425	49.250	0.175	18.9	150	5.14	47.8
1.001	5	6	3.680	0.600	49.250	49.200	0.050	73.6	150	5.59	46.3
1.002	6	7	4.739	0.600	49.200	49.150	0.050	94.8	150	5.67	46.1
1.003	7	12	3.726	0.600	49.150	49.100	0.050	74.5	150	5.72	45.9
5.000	10	11	1.455	0.600	49.850	49.800	0.050	29.1	100	5.02	48.1

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	0.770	6.1	3.5	0.650	0.900	0.028	0.0	55	0.801
2.000	1.041	18.4	2.2	0.600	0.675	0.017	0.0	35	0.701
3.000	1.183	20.9	1.2	0.600	0.675	0.009	0.0	24	0.641
2.001	2.326	41.1	3.4	0.675	0.850	0.026	0.0	29	1.409
1.001	1.173	20.7	6.8	0.850	0.900	0.054	0.0	59	1.050
1.002	1.032	18.2	6.7	0.900	0.950	0.054	0.0	63	0.955
1.003	1.166	20.6	6.7	0.950	1.000	0.054	0.0	59	1.044
5.000	1.436	11.3	1.2	0.600	0.550	0.009	0.0	21	0.918

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)
4.000	8	9	1.409	0.600	50.050	50.000	0.050	28.2	100	5.02	48.2
4.001	9	11	5.428	0.600	50.000	49.925	0.075	72.4	100	5.12	47.8
4.002	11	12	19.045	0.600	49.800	49.125	0.675	28.2	100	5.33	47.1
1.004	12	12_OUT	6.717	0.600	49.075	49.000	0.075	89.6	150	5.83	45.6

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)
4.000	1.459	11.5	1.2	0.600	0.400	0.009	0.0	21	0.933
4.001	0.906	7.1	1.2	0.400	0.425	0.009	0.0	28	0.671
4.002	1.458	11.5	2.3	0.550	1.025	0.018	0.0	30	1.133
1.004	1.062	18.8	8.9	1.025	0.850	0.072	0.0	73	1.050

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	✓	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node 1 Design Modifiers (Hydrograph)

Overrides Design Area	x	Depression Storage Depth (mm)	15
Overrides Design Additional Inflow	x	Evapo-transpiration (mm/day)	1
Depression Storage Area (m²)	180		

Applies to All storms

Node 2 Time-Area Diagram

Overrides Design Area	✓	Depression Storage Depth (mm)	25
Overrides Design Additional Inflow	x	Evapo-transpiration (mm/day)	0
Depression Storage Area (m²)	166		

Applies to All storms

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-1	0.004	1-2	0.004	2-3	0.003	3-4	0.003	4-5	0.003

Node 3 Time-Area Diagram

Overrides Design Area	✓	Depression Storage Area (m²)	90	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	25		

Applies to All storms

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-1	0.002	1-2	0.002	2-3	0.002	3-4	0.002	4-5	0.001

Node 12 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.550	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	49.075	Diameter (m)	0.025		

Node 5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	49.250
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	65.0	0.0	0.400	65.0	0.0	0.401	0.0	0.0

Node 8 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	50.650
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.75	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	5.7	0.0	0.100	9.0	0.0	0.101	0.0	0.0

Node 8 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	50.150
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	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	5.7	0.0	0.200	5.7	0.0	0.201	0.0	0.0

Node 8 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	50.150	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)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	5.000		

Node 10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	50.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.75	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	5.7	0.0	0.100	9.0	0.0	0.101	0.0	0.0

Node 10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	50.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	75

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	5.7	0.0	0.200	5.7	0.0	0.201	0.0	0.0

Node 10 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	50.000	Slope (1:X)	300.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	60	Depth (m)	0.400
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	5.000		

Results for 2 year Critical Storm Duration. Lowest mass balance: 96.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	1	128	49.536	0.036	1.3	0.0272	0.0000	OK
960 minute summer	2	570	49.512	0.012	0.2	0.0053	0.0000	OK
600 minute winter	3	420	49.508	0.008	0.1	0.0018	0.0000	OK
720 minute winter	4	465	49.434	0.009	0.3	0.0015	0.0000	OK
720 minute winter	5	495	49.293	0.043	1.4	2.6304	0.0000	OK
720 minute winter	6	510	49.302	0.102	2.5	0.0162	0.0000	OK
720 minute winter	7	480	49.301	0.151	2.0	0.0240	0.0000	SURCHARGED
15 minute winter	8	10	50.074	0.024	1.2	0.0100	0.0000	OK
15 minute winter	9	10	50.028	0.028	1.2	0.0045	0.0000	OK
15 minute winter	10	10	49.874	0.024	1.2	0.0100	0.0000	OK
15 minute winter	11	11	49.830	0.030	2.3	0.0048	0.0000	OK
720 minute winter	12	480	49.302	0.227	1.5	0.2569	0.0000	SURCHARGED
15 minute summer	12_OUT	1	49.000	0.000	0.5	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)	Discharge Vol (m³)
240 minute summer	1	1.000	5	1.2	1.084	0.195	0.0329	
960 minute summer	2	2.000	4	0.2	0.416	0.011	0.0037	
600 minute winter	3	3.000	4	0.1	0.289	0.005	0.0020	
720 minute winter	4	2.001	5	0.3	0.265	0.007	0.0074	
720 minute winter	5	1.001	6	2.5	0.387	0.118	0.0310	
720 minute winter	6	1.002	7	2.0	0.359	0.108	0.0719	
720 minute winter	7	1.003	12	1.3	0.341	0.065	0.0656	
15 minute winter	8	4.000	9	1.2	0.726	0.103	0.0023	
15 minute winter	9	4.001	11	1.1	0.650	0.162	0.0096	
15 minute winter	10	5.000	11	1.2	0.687	0.105	0.0025	
15 minute winter	11	4.002	12	2.3	0.890	0.201	0.0937	
720 minute winter	12	Orifice	12_OUT	0.6				13.8

Results for 30 year Critical Storm Duration. Lowest mass balance: 96.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	1	20	49.603	0.103	6.3	0.0771	0.0000	SURCHARGED
180 minute winter	2	112	49.525	0.025	1.0	0.0112	0.0000	OK
180 minute winter	3	116	49.516	0.016	0.5	0.0039	0.0000	OK
720 minute winter	4	555	49.468	0.043	0.9	0.0068	0.0000	OK
720 minute winter	5	510	49.468	0.218	1.8	13.4733	0.0000	SURCHARGED
720 minute winter	6	510	49.468	0.268	1.3	0.0426	0.0000	SURCHARGED
720 minute winter	7	510	49.468	0.318	0.8	0.0506	0.0000	SURCHARGED
15 minute winter	8	10	50.088	0.038	2.6	0.0160	0.0000	OK
15 minute winter	9	10	50.044	0.044	2.6	0.0070	0.0000	OK
15 minute winter	10	10	49.889	0.039	2.6	0.0162	0.0000	OK
15 minute winter	11	10	49.847	0.047	5.1	0.0074	0.0000	OK
720 minute winter	12	510	49.468	0.393	0.8	0.4444	0.0000	SURCHARGED
15 minute summer	12_OUT	1	49.000	0.000	0.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	1	1.000	5	5.8	1.281	0.955	0.1170	
180 minute winter	2	2.000	4	1.0	0.636	0.054	0.0113	
180 minute winter	3	3.000	4	0.5	0.434	0.024	0.0063	
720 minute winter	4	2.001	5	1.0	0.201	0.025	0.0360	
720 minute winter	5	1.001	6	-1.3	0.364	-0.064	0.0648	
720 minute winter	6	1.002	7	-1.3	0.134	-0.071	0.0834	
720 minute winter	7	1.003	12	-0.8	-0.044	-0.038	0.0656	
15 minute winter	8	4.000	9	2.6	0.848	0.225	0.0043	
15 minute winter	9	4.001	11	2.6	0.799	0.359	0.0174	
15 minute winter	10	5.000	11	2.6	0.810	0.229	0.0047	
15 minute winter	11	4.002	12	5.1	0.888	0.445	0.1088	
720 minute winter	12	Orifice	12_OUT	0.8				31.7

Results for 100 year Critical Storm Duration. Lowest mass balance: 96.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	1	20	49.796	0.296	8.8	0.2215	0.0000	SURCHARGED
720 minute winter	2	525	49.568	0.068	0.7	0.0306	0.0000	OK
720 minute winter	3	510	49.568	0.068	0.5	0.0163	0.0000	OK
720 minute winter	4	525	49.567	0.142	1.1	0.0226	0.0000	OK
720 minute winter	5	525	49.567	0.317	3.6	19.5857	0.0000	SURCHARGED
720 minute winter	6	525	49.567	0.367	0.8	0.0584	0.0000	SURCHARGED
720 minute winter	7	525	49.567	0.417	0.8	0.0663	0.0000	SURCHARGED
15 minute winter	8	10	50.096	0.046	3.4	0.0190	0.0000	OK
15 minute winter	9	10	50.052	0.052	3.4	0.0082	0.0000	OK
15 minute winter	10	10	49.896	0.046	3.4	0.0193	0.0000	OK
15 minute winter	11	10	49.855	0.055	6.7	0.0087	0.0000	OK
720 minute winter	12	525	49.567	0.492	0.9	0.5563	0.0000	SURCHARGED
15 minute summer	12_OUT	1	49.000	0.000	0.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	1	1.000	5	7.5	1.182	1.245	0.1772	
720 minute winter	2	2.000	4	0.8	0.550	0.045	0.0873	
720 minute winter	3	3.000	4	0.8	0.410	0.036	0.0679	
720 minute winter	4	2.001	5	2.5	0.209	0.061	0.0577	
720 minute winter	5	1.001	6	0.8	0.410	0.039	0.0648	
720 minute winter	6	1.002	7	0.8	0.293	0.045	0.0834	
720 minute winter	7	1.003	12	0.8	0.047	0.041	0.0656	
15 minute winter	8	4.000	9	3.4	0.889	0.294	0.0053	
15 minute winter	9	4.001	11	3.3	0.850	0.466	0.0212	
15 minute winter	10	5.000	11	3.4	0.849	0.298	0.0058	
15 minute winter	11	4.002	12	6.6	0.958	0.577	0.1162	
720 minute winter	12	Orifice	12_OUT	0.9				36.2

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 96.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	1	20	50.223	0.723	13.6	0.5402	0.0000	FLOOD RISK
720 minute winter	2	525	50.180	0.680	1.0	0.3078	0.0000	FLOOD RISK
720 minute winter	3	525	50.179	0.679	1.0	0.1631	0.0000	FLOOD RISK
720 minute winter	4	525	50.179	0.754	2.0	0.1198	0.0000	FLOOD RISK
720 minute winter	5	525	50.180	0.930	4.0	24.7309	0.0000	FLOOD RISK
720 minute winter	6	525	50.178	0.978	1.8	0.1555	0.0000	FLOOD RISK
720 minute winter	7	525	50.178	1.028	1.7	0.1635	0.0000	FLOOD RISK
720 minute winter	8	525	50.179	0.129	0.5	0.2586	0.0000	SURCHARGED
720 minute winter	9	525	50.179	0.179	0.5	0.0285	0.0000	SURCHARGED
720 minute winter	10	525	50.179	0.329	0.8	1.7228	0.0000	SURCHARGED
720 minute winter	11	525	50.179	0.379	1.0	0.0602	0.0000	FLOOD RISK
720 minute winter	12	525	50.178	1.103	1.6	1.2475	0.0000	FLOOD RISK
15 minute summer	12_OUT	1	49.000	0.000	0.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	1	1.000	5	10.8	1.499	1.784	0.1947	
720 minute winter	2	2.000	4	1.7	0.594	0.092	0.1231	
720 minute winter	3	3.000	4	1.2	0.435	0.058	0.0956	
720 minute winter	4	2.001	5	2.3	0.215	0.057	0.0583	
720 minute winter	5	1.001	6	1.8	0.359	0.087	0.0648	
720 minute winter	6	1.002	7	1.7	0.292	0.094	0.0834	
720 minute winter	7	1.003	12	1.6	0.091	0.078	0.0656	
720 minute winter	8	4.000	9	0.5	0.585	0.044	0.0110	
720 minute winter	9	4.001	11	0.5	0.514	0.070	0.0425	
720 minute winter	10	5.000	11	0.5	0.548	0.044	0.0114	
720 minute winter	11	4.002	12	1.0	0.552	0.087	0.1490	
720 minute winter	12	Orifice	12_OUT	1.4				47.4