

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	0.027	5.00	2.400	450	194.833	174.707	0.750
2	0.013	5.00	2.380	450	215.510	186.278	0.750
3	0.018	5.00	2.330	450	214.795	171.823	0.880
4	0.018	5.00	2.280	450	231.811	168.538	1.030
5	0.037	5.00	2.330	450	251.191	182.188	0.750
6	0.037	5.00	2.220	1200	249.537	165.030	1.295
7			2.220	450	250.355	162.027	1.320
8			2.300	450	251.246	158.768	1.480
8_OUT			1.400	1200	271.000	156.000	0.625

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	3	20.169	0.600	1.650	1.450	0.200	100.8	150	5.34	50.0
2.000	2	3	14.473	0.600	1.630	1.450	0.180	80.4	150	5.22	50.0
1.001	3	4	17.330	0.600	1.450	1.250	0.200	86.7	150	5.60	50.0
1.002	4	6	18.070	0.600	1.250	1.000	0.250	72.3	150	5.86	50.0
3.000	5	6	17.238	0.600	1.580	1.000	0.580	29.7	150	5.16	50.0
1.003	6	7	3.112	0.600	0.925	0.900	0.025	124.5	150	5.92	5.0
1.004	7	8	3.379	0.600	1.000	0.820	0.180	18.8	150	5.94	5.0
1.005	8	8_OUT	19.947	0.600	0.820	0.775	0.045	443.3	300	6.39	48.3

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	1.000	17.7	3.7	0.600	0.730	0.027	0.0
2.000	1.122	19.8	1.8	0.600	0.730	0.013	0.0
1.001	1.080	19.1	7.9	0.730	0.880	0.058	0.0
1.002	1.184	20.9	10.3	0.880	1.070	0.076	0.0
3.000	1.853	32.8	5.0	0.600	1.070	0.037	0.0
1.003	0.899	15.9	2.0	1.145	1.170	0.150	0.0
1.004	2.335	41.3	2.0	1.070	1.330	0.150	0.0
1.005	0.740	52.3	19.6	1.180	0.325	0.150	0.0

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Detailed	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)	1440	Check Discharge Volume	x

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
30	0	0	0
100	0	0	0
100	20	0	0
100	40	0	0

Node 8_OUT Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m²)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		
Applies to All storms					

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	0.200	90	0.800	180	1.400	270	0.800	360	0.200
30	0.400	120	1.000	210	1.200	300	0.600		
60	0.600	150	1.200	240	1.000	330	0.400		

Node 6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	0.925	Product Number	CTL-SHE-0064-2000-1200-2000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	1.800	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	520	Depth (m)	0.450
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	16.000		

Node 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	1.780	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	552	Depth (m)	0.450
Safety Factor	2.0	Width (m)	12.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.500		

Node 3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	1.730	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	664	Depth (m)	0.450
Safety Factor	2.0	Width (m)	12.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.500		

Node 4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	1.680	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	720	Depth (m)	0.450
Safety Factor	2.0	Width (m)	4.000	Inf Depth (m)	
Porosity	0.30	Length (m)	24.000		

Node 5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	1.730	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	600	Depth (m)	0.450
Safety Factor	2.0	Width (m)	2.800	Inf Depth (m)	
Porosity	0.30	Length (m)	23.800		

Node 5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	1.730	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	664	Depth (m)	0.450
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node 6 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	1.620	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	872	Depth (m)	0.450
Safety Factor	2.0	Width (m)	14.000	Inf Depth (m)	
Porosity	0.30	Length (m)	12.000		

Results for 30 year Critical Storm Duration. Lowest mass balance: 90.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	1	288	1.998	0.348	1.5	3.1363	0.0000	SURCHARGED
360 minute winter	2	296	1.998	0.368	1.5	6.4306	0.0000	SURCHARGED
360 minute winter	3	296	1.998	0.548	2.3	8.4455	0.0000	SURCHARGED
360 minute winter	4	296	1.997	0.747	1.5	6.0762	0.0000	FLOOD RISK
360 minute winter	5	288	1.997	0.417	2.1	9.9662	0.0000	SURCHARGED
360 minute winter	6	296	1.997	1.072	2.6	17.8054	0.0000	FLOOD RISK
240 minute winter	7	208	1.983	1.083	1.8	0.1722	0.0000	FLOOD RISK
240 minute winter	8	208	1.983	1.163	1.9	0.1849	0.0000	SURCHARGED
180 minute summer	8_OUT	180	2.175	1.400	1.5	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)
360 minute winter	1	1.000	3	1.0	0.301	0.058	0.3551	
360 minute winter	2	2.000	3	-0.8	0.164	-0.039	0.2548	
360 minute winter	3	1.001	4	1.0	0.455	0.051	0.3051	
360 minute winter	4	1.002	6	1.2	0.448	0.056	0.3181	
360 minute winter	5	3.000	6	0.7	0.500	0.021	0.3035	
360 minute winter	6	Hydro-Brake®	7	1.8				
240 minute winter	7	1.004	8	1.9	0.700	0.046	0.0595	
240 minute winter	8	1.005	8_OUT	2.3	0.051	0.044	1.4047	64.6

Results for 100 year Critical Storm Duration. Lowest mass balance: 90.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	1	320	2.096	0.446	2.1	5.5821	0.0000	SURCHARGED
360 minute winter	2	320	2.096	0.466	1.9	10.1948	0.0000	FLOOD RISK
360 minute winter	3	320	2.096	0.646	2.8	12.2155	0.0000	FLOOD RISK
360 minute winter	4	320	2.096	0.846	1.9	8.9544	0.0000	FLOOD RISK
360 minute winter	5	320	2.095	0.515	2.8	14.9882	0.0000	FLOOD RISK
360 minute winter	6	320	2.095	1.170	3.2	21.6788	0.0000	FLOOD RISK
240 minute winter	7	196	2.052	1.152	1.8	0.1832	0.0000	FLOOD RISK
240 minute winter	8	196	2.052	1.232	2.5	0.1959	0.0000	FLOOD RISK
180 minute summer	8_OUT	180	2.175	1.400	2.5	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)
360 minute winter	1	1.000	3	1.2	0.328	0.067	0.3551	
360 minute winter	2	2.000	3	-1.0	0.211	-0.049	0.2548	
360 minute winter	3	1.001	4	1.2	0.484	0.062	0.3051	
360 minute winter	4	1.002	6	1.3	0.365	0.065	0.3181	
360 minute winter	5	3.000	6	0.8	0.309	0.026	0.3035	
360 minute winter	6	Hydro-Brake®	7	1.9				
240 minute winter	7	1.004	8	2.5	0.441	0.061	0.0595	
240 minute winter	8	1.005	8_OUT	3.0	0.053	0.058	1.4047	87.9

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 90.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	1	344	2.222	0.572	2.5	8.7069	0.0000	FLOOD RISK
360 minute winter	2	344	2.221	0.591	2.2	15.0045	0.0000	FLOOD RISK
360 minute winter	3	344	2.221	0.771	3.2	15.4878	0.0000	FLOOD RISK
360 minute winter	4	344	2.221	0.971	2.6	10.0246	0.0000	FLOOD RISK
360 minute winter	5	336	2.220	0.640	3.4	19.3930	0.0000	FLOOD RISK
360 minute winter	6	336	2.220	1.295	3.8	21.8913	0.1276	FLOOD
180 minute winter	7	184	2.122	1.222	1.9	0.1943	0.0000	FLOOD RISK
180 minute winter	8	184	2.122	1.302	2.0	0.2071	0.0000	FLOOD RISK
240 minute summer	8_OUT	180	2.175	1.400	2.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	1	1.000	3	1.3	0.329	0.072	0.3551	
360 minute winter	2	2.000	3	1.1	0.200	0.056	0.2548	
360 minute winter	3	1.001	4	1.9	0.519	0.098	0.3051	
360 minute winter	4	1.002	6	1.9	0.354	0.090	0.3181	
360 minute winter	5	3.000	6	0.9	0.198	0.028	0.3035	
360 minute winter	6	Hydro-Brake®	7	2.0				
180 minute winter	7	1.004	8	2.0	0.865	0.048	0.0595	
180 minute winter	8	1.005	8_OUT	2.4	0.053	0.046	1.4047	97.3

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 90.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	1	312	2.236	0.586	2.3	9.0661	0.0000	FLOOD RISK
360 minute winter	2	240	2.237	0.607	3.6	15.3567	0.0000	FLOOD RISK
360 minute winter	3	240	2.236	0.786	4.4	15.4960	0.0000	FLOOD RISK
360 minute winter	4	240	2.232	0.982	3.7	10.0303	0.0000	FLOOD RISK
360 minute winter	5	232	2.223	0.643	5.2	19.3967	0.0000	FLOOD RISK
480 minute winter	6	296	2.220	1.295	7.8	21.8913	20.6050	FLOOD
180 minute winter	7	180	2.177	1.277	1.9	0.2031	0.0000	FLOOD RISK
180 minute winter	8	180	2.176	1.356	2.0	0.2156	0.0000	FLOOD RISK
180 minute winter	8_OUT	180	2.175	1.400	2.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	1	1.000	3	1.3	0.326	0.074	0.3551	
360 minute winter	2	2.000	3	-2.8	0.190	-0.140	0.2548	
360 minute winter	3	1.001	4	2.8	0.538	0.146	0.3051	
360 minute winter	4	1.002	6	3.7	0.264	0.176	0.3181	
360 minute winter	5	3.000	6	2.3	0.170	0.070	0.3035	
480 minute winter	6	Hydro-Brake®	7	2.0				
180 minute winter	7	1.004	8	2.0	0.690	0.049	0.0595	
180 minute winter	8	1.005	8_OUT	2.4	0.054	0.047	1.4047	109.7