

Design Settings

Rainfall Methodology	FEH-22	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)	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)	0.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
S1	0.043	5.00	38.950	1200	1.500
S2	0.010	5.00	38.840	1200	1.490
SOAKAWAY			38.900	300	1.600
DUMMY	0.000	5.00	38.900	100	0.400
CARPARK 1	0.039		38.900	100	0.450
SIC2	0.000	5.00	38.900	100	0.400
CARPARK 2	0.023		38.900	100	0.450
SIC3	0.000	5.00	38.750	100	0.400
CARPARK 3	0.044		38.750	100	0.450
SIC4	0.000	5.00	39.100	100	0.400
CARPARK 4	0.108		39.100	100	0.450
SIC5	0.000	5.00	39.300	100	0.400
CARPARK 5	0.154		39.300	100	0.450

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	S1	S2	28.000	0.600	37.450	37.350	0.100	280.0	300	5.50	0.0
1.001	S2	SOAKAWAY	14.000	0.600	37.350	37.300	0.050	280.0	300	5.75	0.0
2.000	DUMMY	CARPARK 1	5.000	0.600	38.500	38.450	0.050	100.0	150	5.08	0.0
3.000	SIC2	CARPARK 2	5.000	0.600	38.500	38.450	0.050	100.0	150	5.08	0.0
4.000	SIC3	CARPARK 3	5.000	0.600	38.350	38.300	0.050	100.0	150	5.08	0.0
5.000	SIC4	CARPARK 4	5.000	0.600	38.700	38.650	0.050	100.0	150	5.08	0.0
6.000	SIC5	CARPARK 5	5.000	0.600	38.900	38.850	0.050	100.0	150	5.08	0.0

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	0.934	66.0	0.0	1.200	1.190	0.043	0.0	0	0.000
1.001	0.934	66.0	0.0	1.190	1.300	0.053	0.0	0	0.000
2.000	1.005	17.8	0.0	0.250	0.300	0.000	0.0	0	0.000
3.000	1.005	17.8	0.0	0.250	0.300	0.000	0.0	0	0.000
4.000	1.005	17.8	0.0	0.250	0.300	0.000	0.0	0	0.000
5.000	1.005	17.8	0.0	0.250	0.300	0.000	0.0	0	0.000
6.000	1.005	17.8	0.0	0.250	0.300	0.000	0.0	0	0.000

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	28.000	280.0	300	Circular	38.950	37.450	1.200	38.840	37.350	1.190
1.001	14.000	280.0	300	Circular	38.840	37.350	1.190	38.900	37.300	1.300
2.000	5.000	100.0	150	Circular	38.900	38.500	0.250	38.900	38.450	0.300
3.000	5.000	100.0	150	Circular	38.900	38.500	0.250	38.900	38.450	0.300
4.000	5.000	100.0	150	Circular	38.750	38.350	0.250	38.750	38.300	0.300
5.000	5.000	100.0	150	Circular	39.100	38.700	0.250	39.100	38.650	0.300
6.000	5.000	100.0	150	Circular	39.300	38.900	0.250	39.300	38.850	0.300

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	1200	Manhole	Adoptable	S2	1200	Manhole	Adoptable
1.001	S2	1200	Manhole	Adoptable	SOAKAWAY	300	Manhole	Adoptable
2.000	DUMMY	100	Manhole	Adoptable	CARPARK 1	100	Manhole	Adoptable
3.000	SIC2	100	Manhole	Adoptable	CARPARK 2	100	Manhole	Adoptable
4.000	SIC3	100	Manhole	Adoptable	CARPARK 3	100	Manhole	Adoptable
5.000	SIC4	100	Manhole	Adoptable	CARPARK 4	100	Manhole	Adoptable
6.000	SIC5	100	Manhole	Adoptable	CARPARK 5	100	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S1	38.950	1.500	1200		0	1.000	37.450	300
S2	38.840	1.490	1200		1	1.000	37.350	300
					0	1.001	37.350	300
SOAKAWAY	38.900	1.600	300		1	1.001	37.300	300
DUMMY	38.900	0.400	100					
					0	2.000	38.500	150
CARPARK 1	38.900	0.450	100		1	2.000	38.450	150
SIC2	38.900	0.400	100					
					0	3.000	38.500	150
CARPARK 2	38.900	0.450	100		1	3.000	38.450	150

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
SIC3	38.750	0.400	100					
				0	4.000	38.350	150	
CARPARK 3	38.750	0.450	100		1	4.000	38.300	150
SIC4	39.100	0.400	100					
				0	5.000	38.700	150	
CARPARK 4	39.100	0.450	100		1	5.000	38.650	150
SIC5	39.300	0.400	100					
				0	6.000	38.900	150	
CARPARK 5	39.300	0.450	100		1	6.000	38.850	150

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	10080	Check Discharge Volume	x

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 %)
2	0	0	0
30	35	0	0
100	40	0	0

Node SOAKAWAY Online Head/Flow Control

Flap Valve x | Replaces Downstream Link ✓ | Invert Level (m) 37.300

Head (m) 0.001
Flow (l/s) 0.000

Node CARPARK 2 Online Head/Flow Control

Flap Valve x | Replaces Downstream Link ✓ | Invert Level (m) 38.450

Head Flow
(m) (l/s)
0.001 0.000

Node CARPARK 3 Online Head/Flow Control

Flap Valve x | Replaces Downstream Link ✓ | Invert Level (m) 38.300

Head Flow
(m) (l/s)
0.001 0.000

Node SOAKAWAY Lined Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00360	Invert Level (m)	36.200	Pit Length (m)	2.400
Side Inf Coefficient (m/hr)	0.00650	Time to half empty (mins)	9360	Depth (m)	
Safety Factor	2.0	Ring Diameter (m)	2.100	Inf Depth (m)	
Porosity	1.00	Pit Width (m)	2.400	Number Required	3

Node CARPARK 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00650	Invert Level (m)	38.450	Slope (1:X)	5000.0
Side Inf Coefficient (m/hr)	0.00650	Time to half empty (mins)	409	Depth (m)	
Safety Factor	2.0	Width (m)	15.000	Inf Depth (m)	
Porosity	0.30	Length (m)	26.000		

Node CARPARK 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00650	Invert Level (m)	38.400	Slope (1:X)	5000.0
Side Inf Coefficient (m/hr)	0.00650	Time to half empty (mins)	1808	Depth (m)	
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	24.000		

Node CARPARK 3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00650	Invert Level (m)	38.150	Slope (1:X)	5000.0
Side Inf Coefficient (m/hr)	0.00650	Time to half empty (mins)	2168	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	19.000		

Node CARPARK 4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00650	Invert Level (m)	38.600	Slope (1:X)	5000.0
Side Inf Coefficient (m/hr)	0.00650	Time to half empty (mins)	542	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	57.000		

Node CARPARK 5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00650	Invert Level (m)	38.700	Slope (1:X)	5000.0
Side Inf Coefficient (m/hr)	0.00650	Time to half empty (mins)	804	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	69.000		

Other (defaults)

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

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m³)	
Full Bore Velocity	✓		

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	37.508	0.058	5.6	0.0658	0.0000	OK
15 minute winter	S2	11	37.416	0.066	6.8	0.0752	0.0000	OK
10080 minute winter	SOAKAWAY	6660	37.060	-0.240	0.1	14.8679	0.0000	OK
15 minute summer	DUMMY	1	38.500	0.000	0.0	0.0000	0.0000	OK
240 minute winter	CARPARK 1	184	38.496	0.046	1.3	4.8882	0.0000	OK
15 minute summer	SIC2	1	38.500	0.000	0.0	0.0000	0.0000	OK
600 minute winter	CARPARK 2	435	38.496	0.046	0.4	3.3727	0.0000	OK
15 minute summer	SIC3	1	38.350	0.000	0.0	0.0000	0.0000	OK
480 minute winter	CARPARK 3	440	38.270	-0.030	0.9	6.7326	0.0000	OK
15 minute summer	SIC4	1	38.700	0.000	0.0	0.0000	0.0000	OK
360 minute winter	CARPARK 4	288	38.696	0.046	2.7	15.3532	0.0000	OK
15 minute summer	SIC5	1	38.900	0.000	0.0	0.0000	0.0000	OK
360 minute winter	CARPARK 5	336	38.817	-0.033	3.8	22.7808	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S2	5.5	0.532	0.084	0.2933	
15 minute winter	S2	1.001	SOAKAWAY	6.7	0.614	0.101	0.1529	
10080 minute winter	SOAKAWAY	Head/Flow		0.0				0.0
10080 minute winter	SOAKAWAY	Infiltration		0.0				
15 minute summer	DUMMY	2.000	CARPARK 1	0.0	0.000	0.000	0.0036	
240 minute winter	CARPARK 1	Infiltration		0.3				
15 minute summer	SIC2	3.000	CARPARK 2	0.0	0.000	0.000	0.0000	
600 minute winter	CARPARK 2	Head/Flow		0.0				0.0
600 minute winter	CARPARK 2	Infiltration		0.1				
15 minute summer	SIC3	4.000	CARPARK 3	0.0	0.000	0.000	0.0000	
480 minute winter	CARPARK 3	Head/Flow		0.0				0.0
480 minute winter	CARPARK 3	Infiltration		0.2				
15 minute summer	SIC4	5.000	CARPARK 4	0.0	0.000	0.000	0.0000	
360 minute winter	CARPARK 4	Infiltration		0.5				
15 minute summer	SIC5	6.000	CARPARK 5	0.0	0.000	0.000	0.0000	
360 minute winter	CARPARK 5	Infiltration		0.6				

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
5760 minute winter	S1	5340	38.376	0.926	0.3	1.0472	0.0000	SURCHARGED
5760 minute winter	S2	5340	38.376	1.026	0.4	1.1603	0.0000	SURCHARGED
5760 minute winter	SOAKAWAY	5340	38.376	1.076	0.4	37.6758	0.0000	OK

240 minute winter	DUMMY	236	38.615	0.115	0.0	0.0009	0.0000	OK
240 minute winter	CARPARK 1	236	38.615	0.165	3.9	18.4650	0.0000	OK

720 minute winter	SIC2	690	38.732	0.232	0.0	0.0019	0.0000	FLOOD RISK
720 minute winter	CARPARK 2	690	38.732	0.282	0.9	11.8659	0.0000	OK

480 minute winter	SIC3	472	38.576	0.226	0.1	0.0018	0.0000	FLOOD RISK
480 minute winter	CARPARK 3	472	38.576	0.276	2.5	24.1672	0.0000	OK

480 minute winter	SIC4	472	38.943	0.243	0.0	0.0019	0.0000	FLOOD RISK
480 minute winter	CARPARK 4	472	38.943	0.293	6.2	57.4901	0.0000	OK

480 minute winter	SIC5	472	39.117	0.217	0.1	0.0017	0.0000	FLOOD RISK
480 minute winter	CARPARK 5	472	39.117	0.267	8.8	84.9176	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)
5760 minute winter	S1	1.000	S2	0.3	0.215	0.005	1.9717	
5760 minute winter	S2	1.001	SOAKAWAY	0.4	0.279	0.006	0.9859	
5760 minute winter	SOAKAWAY	Head/Flow		0.0				0.0
5760 minute winter	SOAKAWAY	Infiltration		0.1				
240 minute winter	DUMMY	2.000	CARPARK 1	0.0	-0.011	-0.002	0.0804	
240 minute winter	CARPARK 1	Infiltration		0.4				
720 minute winter	SIC2	3.000	CARPARK 2	0.0	-0.009	-0.002	0.0880	
720 minute winter	CARPARK 2	Head/Flow		0.0				0.0
720 minute winter	CARPARK 2	Infiltration		0.1				
480 minute winter	SIC3	4.000	CARPARK 3	-0.1	-0.014	-0.003	0.0880	
480 minute winter	CARPARK 3	Head/Flow		0.0				0.0
480 minute winter	CARPARK 3	Infiltration		0.2				
480 minute winter	SIC4	5.000	CARPARK 4	0.0	-0.012	-0.003	0.0880	
480 minute winter	CARPARK 4	Infiltration		0.6				
480 minute winter	SIC5	6.000	CARPARK 5	-0.1	-0.016	-0.003	0.0880	
480 minute winter	CARPARK 5	Infiltration		0.7				

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
7200 minute winter	S1	6660	38.840	1.390	0.3	1.5721	0.0000	FLOOD RISK
7200 minute winter	S2	6660	38.840	1.490	0.4	1.6852	0.1799	FLOOD
7200 minute winter	SOAKAWAY	6720	38.840	1.540	0.4	45.7287	0.0000	OK
360 minute winter	DUMMY	352	38.674	0.174	0.0	0.0014	0.0000	FLOOD RISK
360 minute winter	CARPARK 1	352	38.674	0.224	3.7	25.2096	0.0000	OK
480 minute winter	SIC2	472	38.857	0.357	0.1	0.0029	0.0000	FLOOD RISK
480 minute winter	CARPARK 2	472	38.857	0.407	1.7	16.3611	0.0000	OK
480 minute winter	SIC3	472	38.724	0.374	0.1	0.0030	0.0000	FLOOD RISK
480 minute winter	CARPARK 3	472	38.724	0.424	3.3	32.6125	0.0000	OK
480 minute winter	SIC4	472	39.061	0.361	0.1	0.0029	0.0000	FLOOD RISK
480 minute winter	CARPARK 4	472	39.061	0.411	8.0	77.7613	0.0000	OK
600 minute winter	SIC5	585	39.256	0.356	0.1	0.0028	0.0000	FLOOD RISK
600 minute winter	CARPARK 5	585	39.256	0.406	9.4	113.6357	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)
7200 minute winter	S1	1.000	S2	0.3	0.215	0.005	1.9717	
7200 minute winter	S2	1.001	SOAKAWAY	0.4	0.279	0.006	0.9859	
7200 minute winter	SOAKAWAY	Head/Flow		0.0				0.0
7200 minute winter	SOAKAWAY	Infiltration		0.1				
360 minute winter	DUMMY	2.000	CARPARK 1	0.0	-0.008	0.002	0.0880	
360 minute winter	CARPARK 1	Infiltration		0.4				
480 minute winter	SIC2	3.000	CARPARK 2	-0.1	-0.011	-0.003	0.0880	
480 minute winter	CARPARK 2	Head/Flow		0.0				0.0
480 minute winter	CARPARK 2	Infiltration		0.1				
480 minute winter	SIC3	4.000	CARPARK 3	-0.1	-0.018	-0.004	0.0880	
480 minute winter	CARPARK 3	Head/Flow		0.0				0.0
480 minute winter	CARPARK 3	Infiltration		0.2				
480 minute winter	SIC4	5.000	CARPARK 4	-0.1	-0.011	-0.003	0.0880	
480 minute winter	CARPARK 4	Infiltration		0.6				
600 minute winter	SIC5	6.000	CARPARK 5	-0.1	-0.008	-0.003	0.0880	
600 minute winter	CARPARK 5	Infiltration		0.7				