

Appendix B

Email Correspondence from Causeway Drainage support &
Revised Calculations for 1.89 l/s discharge

Lindsay Cunningham

From: Causeway Support [REDACTED]
Sent: 17 December 2025 17:35
To: Lindsay Cunningham
Subject: Causeway Support - Causeway Flow - Rounding up error - Ref: 00342740 [ref:!00D4K01miCD.!500P30ZpWrP:ref]

This sender is trusted.

Hi Lindsay

Thanks for getting in touch.

Unfortunately this is just the way Flow has been designed where the design flow is rounded up to nearest 1 decimal place. I will paste a link below to a design ideas portal where you can suggest enhancement ideas you'd like to see in the future such as this one.

[Design Ideas Portal](#)

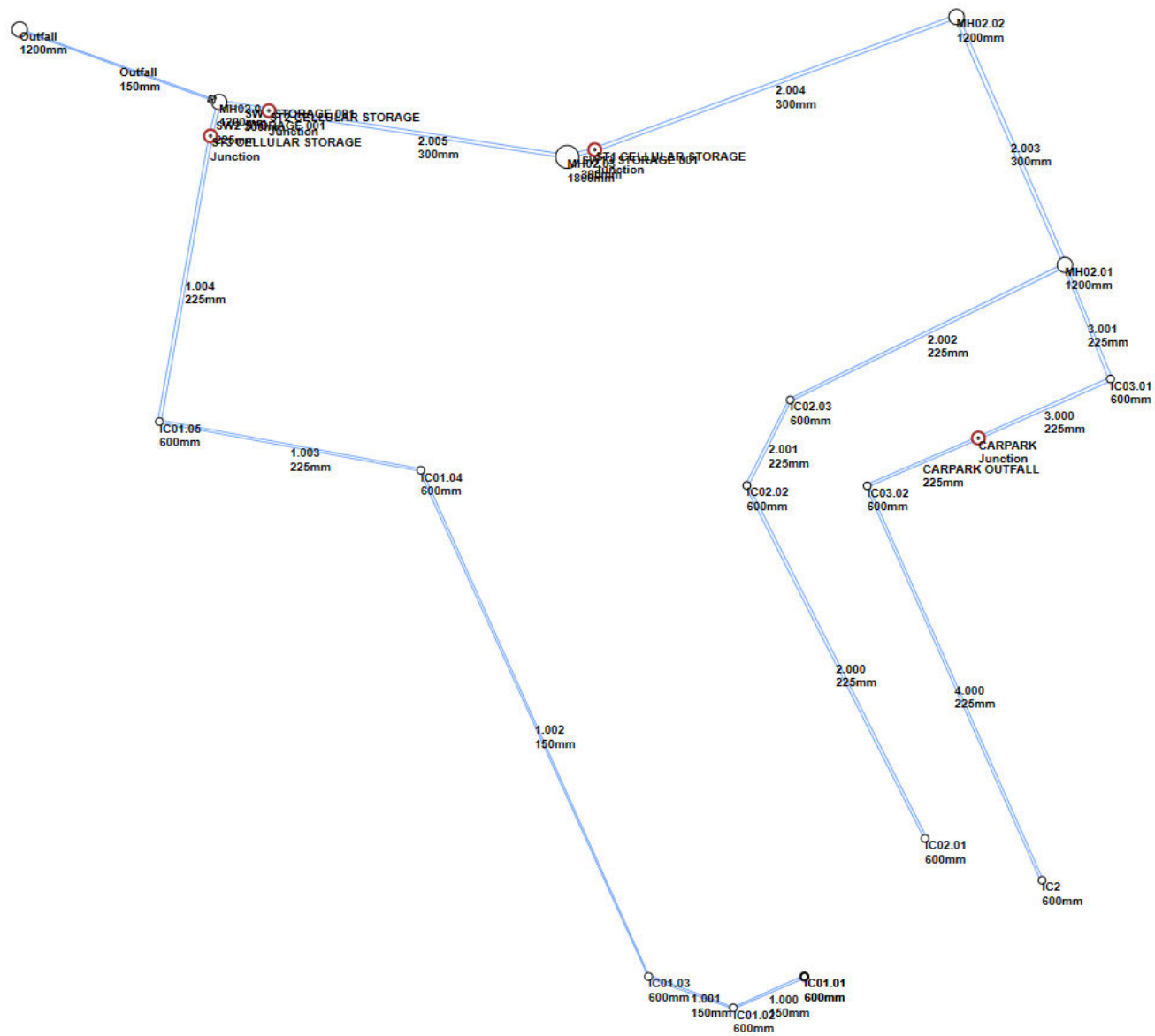
Regards,
Woody Shaher
Technical Support Engineer

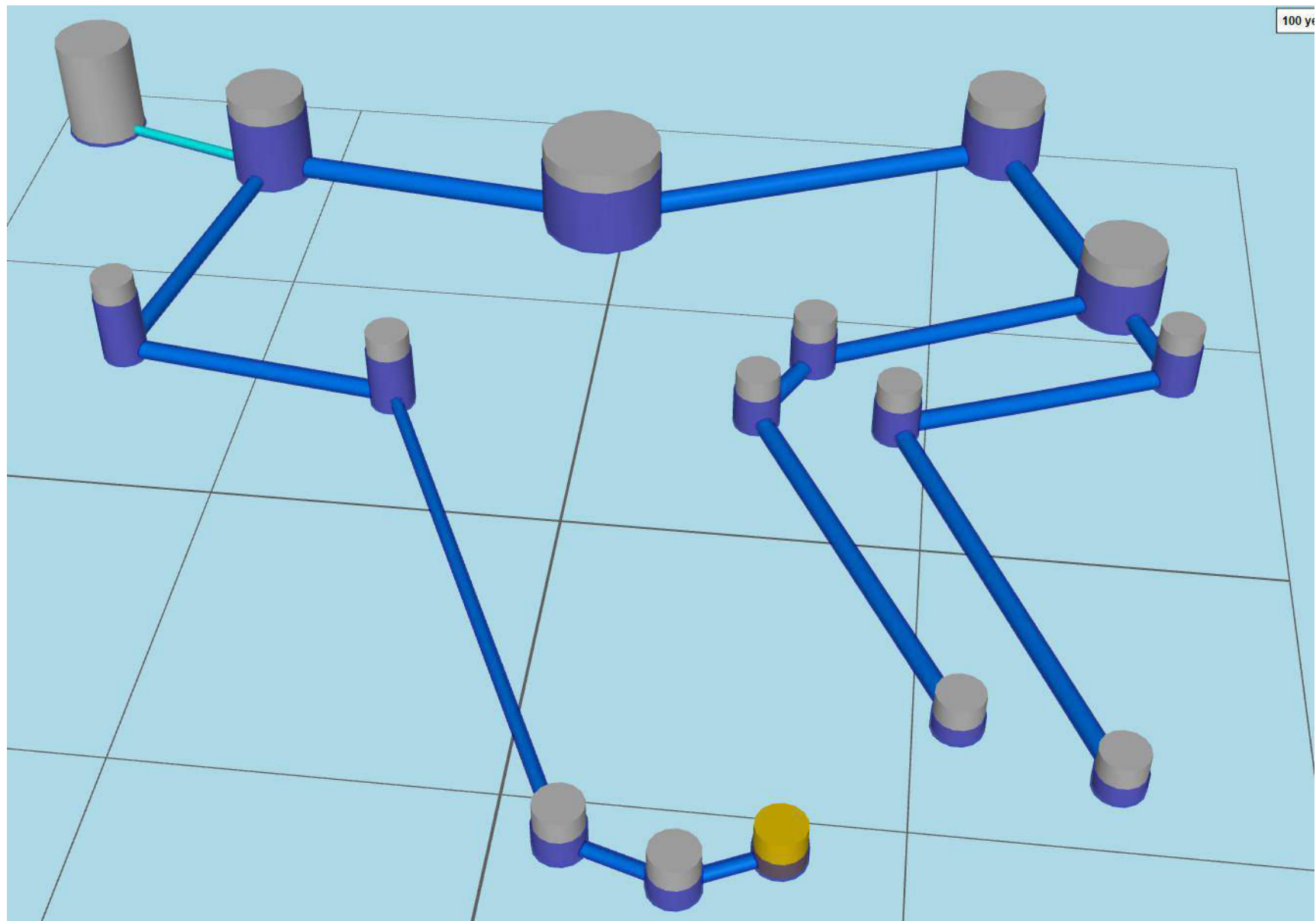


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ref:!00D4K01miCD.!500P30ZpWrP:ref



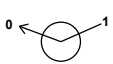
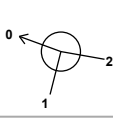


Pipeline Schedule

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	6.015	100.0	150	Circular	6.050	5.500	0.400	6.050	5.440	0.460
1.001	7.009	100.0	150	Circular	6.050	5.440	0.460	6.050	5.370	0.530
1.002	43.227	100.0	150	Circular	6.050	5.370	0.530	6.050	4.938	0.962
1.003	20.604	125.0	225	Circular	6.050	4.863	0.962	6.050	4.698	1.127
1.004	22.607	200.0	225	Circular	6.050	4.698	1.127	6.050	4.585	1.240
2.000	30.782	100.0	225	Circular	6.050	5.500	0.325	6.050	5.192	0.633
3.001	9.569	180.0	225	Circular	6.050	5.047	0.778	6.050	4.994	0.831
2.001	7.464	150.0	225	Circular	6.050	5.192	0.633	6.050	5.142	0.683
2.002	23.754	180.0	225	Circular	6.050	5.142	0.683	6.050	5.010	0.815
2.003	21.081	200.0	300	Circular	6.050	4.919	0.831	6.050	4.814	0.936
2.004	29.881	240.0	300	Circular	6.050	4.814	0.936	6.050	4.689	1.061
2.005	23.396	240.0	300	Circular	6.050	4.680	1.070	6.050	4.583	1.167
4.000	33.596	116.0	225	Circular	6.050	5.475	0.350	6.050	5.185	0.640
3.000	11.222	150.0	225	Circular	6.050	5.122	0.703	6.050	5.047	0.778
Outfall	16.463	115.0	150	Circular	6.050	4.567	1.333	6.050	4.424	1.476
SW1 STORAGE 001	3.913	240.0	300	Circular	6.050	4.583	1.167	6.050	4.567	1.183
SW13 STORAGE 001	2.206	240.0	300	Circular	6.050	4.689	1.061	6.050	4.680	1.070
SW2 STORAGE 001	2.732	200.0	225	Circular	6.050	4.585	1.240	6.050	4.571	1.254
CARPARK OUTFALL	9.381	150.0	225	Circular	6.050	5.185	0.640	6.050	5.122	0.703

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	IC01.01	600	Manhole	Adoptable	IC01.02	600	Manhole	Adoptable
1.001	IC01.02	600	Manhole	Adoptable	IC01.03	600	Manhole	Adoptable
1.002	IC01.03	600	Manhole	Adoptable	IC01.04	600	Manhole	Adoptable
1.003	IC01.04	600	Manhole	Adoptable	IC01.05	600	Manhole	Adoptable
1.004	IC01.05	600	Manhole	Adoptable	ST3 CELLULAR STORAGE		Junction	
2.000	IC02.01	600	Manhole	Adoptable	IC02.02	600	Manhole	Adoptable
3.001	IC03.01	600	Manhole	Adoptable	MH02.01	1200	Manhole	Adoptable
2.001	IC02.02	600	Manhole	Adoptable	IC02.03	600	Manhole	Adoptable
2.002	IC02.03	600	Manhole	Adoptable	MH02.01	1200	Manhole	Adoptable
2.003	MH02.01	1200	Manhole	Adoptable	MH02.02	1200	Manhole	Adoptable
2.004	MH02.02	1200	Manhole	Adoptable	ST1 CELLULAR STORAGE		Junction	
2.005	MH02.03	1800	Manhole	Adoptable	ST2 CELLULAR STORAGE		Junction	
4.000	IC2	600	Manhole	Adoptable	IC03.02	600	Manhole	Adoptable
3.000	CARPARK		Junction		IC03.01	600	Manhole	Adoptable
Outfall	MH02.04	1200	Manhole	Adoptable	Outfall	1200	Manhole	Adoptable
SW1 STORAGE 001	ST2 CELLULAR STORAGE		Junction		MH02.04	1200	Manhole	Adoptable
SW13 STORAGE 001	ST1 CELLULAR STORAGE		Junction		MH02.03	1800	Manhole	Adoptable
SW2 STORAGE 001	ST3 CELLULAR STORAGE		Junction		MH02.04	1200	Manhole	Adoptable
CARPARK OUTFALL	IC03.02	600	Manhole	Adoptable	CARPARK		Junction	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
IC01.01	489416.234	98874.676	6.050	0.550	600				
						0	1.000	5.500	150
IC01.02	489410.733	98872.244	6.050	0.610	600		1	1.000	5.440
						0	1.001	5.440	150
IC01.03	489404.164	98874.687	6.050	0.680	600		1	1.001	5.370
						0	1.002	5.370	150
IC01.04	489386.516	98914.147	6.050	1.187	600		1	1.002	4.938
						0	1.003	4.863	225
IC01.05	489366.264	98917.938	6.050	1.352	600		1	1.003	4.698
						0	1.004	4.698	225
MH02.04	489370.891	98942.845	6.050	1.483	1200		1	SW2 STORAGE 001	4.571
						2	SW1 STORAGE 001	4.567	300
						0	Outfall	4.567	150
IC02.01	489425.590	98885.449	6.050	0.550	600				
						0	2.000	5.500	225
IC02.02	489411.777	98912.958	6.050	0.858	600		1	2.000	5.192
						0	2.001	5.192	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
IC03.02	489421.113	98912.929	6.050	0.865	600	1 0	4.000	5.185	225
IC02.03	489415.139	98919.622	6.050	0.908	600	1 0	CARPARK OUTFALL 2.001	5.185 5.142	225 225
MH02.01	489436.432	98930.151	6.050	1.131	1200	0 1 2	2.002 2.002 3.001	5.142 5.010 4.994	225 225 225
MH02.02	489428.026	98949.484	6.050	1.236	1200	0 1	2.003 2.003	4.919 4.814	300 300
MH02.03	489397.862	98938.570	6.050	1.370	1800	0 1	2.004 SW13 STORAGE 001	4.814 4.680	300 300
IC03.01	489439.958	98921.255	6.050	1.003	600	0 1	2.005 3.000	4.680 5.047	300 225
IC2	489434.658	98882.184	6.050	0.575	600	0 1	3.001 4.000	5.047 5.475	225 225
Outfall	489355.430	98948.500	6.050	1.626	1200	0 1	Outfall	4.424	150
ST1 CELLULAR STORAGE	489399.996	98939.130	6.050	1.361		0 1	2.004 SW13 STORAGE 001	4.689 4.689	300 300
ST3 CELLULAR STORAGE	489370.222	98940.196	6.050	1.465		0 1	1.004 SW2 STORAGE 001	4.585 4.585	225 225
ST2 CELLULAR STORAGE	489374.744	98942.165	6.050	1.467		0 1	2.005 SW1 STORAGE 001	4.583 4.583	300 300
CARPARK	489429.724	98916.651	6.050	0.928		0 1	CARPARK OUTFALL 3.000	5.122 5.122	225 225

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0	Check Discharge Volume	x
Summer CV	1.000	Skip Steady State	x	Starting Level (m)			

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 %)
100	45	0	0

Node MH02.04 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	4.567	Product Number	CTL-SHE-0064-1800-1000-1800
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	1.8	Min Node Diameter (mm)	1200

Node ST1 CELLULAR STORAGE Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	4.689
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	51.8	0.0	0.610	51.8	0.0	0.611	0.0	0.0

Node ST3 CELLULAR STORAGE Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	4.585
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	35.0	0.0	0.610	35.0	0.0	0.611	0.0	0.0

Node ST2 CELLULAR STORAGE Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	4.583
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	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	77.8	0.0	0.610	77.8	0.0	0.611	0.0	0.0

Node CARPARK Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	26.000	Depth (m)
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	5.122	Length (m)	25.000	Inf Depth (m)
Safety Factor	2.0	Time to half empty (mins)		Slope (1:X)	250.0	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 98.62%

Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	IC01.01		472	5.750	0.250	0.6	0.0708	0.0000	FLOOD RISK
480 minute winter	IC01.02		472	5.750	0.310	1.1	0.0878	0.0000	FLOOD RISK
480 minute winter	IC01.03		472	5.750	0.380	1.7	0.1075	0.0000	SURCHARGED
480 minute winter	IC01.04		480	5.751	0.888	4.3	0.2513	0.0000	FLOOD RISK
480 minute winter	IC01.05		464	5.750	1.052	5.5	0.2977	0.0000	SURCHARGED
480 minute winter	MH02.04		480	5.750	1.183	8.0	1.3384	0.0000	FLOOD RISK
480 minute winter	IC02.01		472	5.752	0.252	0.5	0.0713	0.0000	FLOOD RISK
480 minute winter	IC02.02		472	5.751	0.559	3.1	0.1583	0.0000	FLOOD RISK
480 minute winter	IC03.02		472	5.751	0.566	5.2	0.1603	0.0000	FLOOD RISK
480 minute winter	IC02.03		464	5.752	0.610	4.7	0.1725	0.0000	FLOOD RISK
480 minute winter	MH02.01		472	5.751	0.832	14.4	0.9415	0.0000	FLOOD RISK
480 minute winter	MH02.02		472	5.752	0.938	11.0	1.0610	0.0000	FLOOD RISK
480 minute winter	MH02.03		472	5.751	1.071	8.9	2.7261	0.0000	FLOOD RISK
480 minute winter	IC03.01		472	5.751	0.704	15.1	0.1993	0.0000	FLOOD RISK
480 minute winter	IC2		472	5.751	0.276	0.9	0.0782	0.0000	FLOOD RISK
480 minute winter	Outfall		472	4.458	0.034	1.9	0.0000	0.0000	OK
480 minute winter	ST1 CELLULAR STORAGE		472	5.756	1.067	10.7	30.0427	0.0000	FLOOD RISK
480 minute winter	ST3 CELLULAR STORAGE		472	5.752	1.167	5.4	20.2991	0.0000	FLOOD RISK
480 minute winter	ST2 CELLULAR STORAGE		472	5.752	1.169	8.8	45.1221	0.0000	FLOOD RISK
480 minute winter	CARPARK		472	5.751	0.629	19.7	112.9630	0.0000	FLOOD RISK

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	IC01.01	1.000	IC01.02	0.6	0.369	0.034	0.1059	
480 minute winter	IC01.02	1.001	IC01.03	1.1	0.475	0.062	0.1234	
480 minute winter	IC01.03	1.002	IC01.04	1.7	0.572	0.096	0.7610	
480 minute winter	IC01.04	1.003	IC01.05	4.2	0.383	0.090	0.8194	
480 minute winter	IC01.05	1.004	ST3 CELLULAR STORAGE	5.4	0.530	0.147	0.8991	
480 minute winter	MH02.04	Outfall	Outfall	1.9	0.621	0.116	0.0508	70.2
480 minute winter	IC02.01	2.000	IC02.02	0.5	0.176	0.010	1.2242	
480 minute winter	IC02.02	2.001	IC02.03	3.0	0.499	0.071	0.2969	
480 minute winter	IC03.02	CARPARK OUTFALL	CARPARK	5.2	0.715	0.122	0.3731	
480 minute winter	IC02.03	2.002	MH02.01	4.7	0.622	0.121	0.9447	
480 minute winter	MH02.01	2.003	MH02.02	10.2	0.641	0.130	1.4845	
480 minute winter	MH02.02	2.004	ST1 CELLULAR STORAGE	10.7	0.623	0.150	2.1042	
480 minute winter	MH02.03	2.005	ST2 CELLULAR STORAGE	6.9	0.553	0.097	1.6475	
480 minute winter	IC03.01	3.001	MH02.01	-14.3	0.639	-0.372	0.3806	
480 minute winter	IC2	4.000	IC03.02	0.9	0.210	0.019	1.3361	
480 minute winter	ST1 CELLULAR STORAGE	SW13 STORAGE 001	MH02.03	-8.7	0.433	-0.122	0.1553	
480 minute winter	ST3 CELLULAR STORAGE	SW2 STORAGE 001	MH02.04	5.4	0.179	0.148	0.1087	
480 minute winter	ST2 CELLULAR STORAGE	SW1 STORAGE 001	MH02.04	-6.6	-0.183	-0.092	0.2756	
480 minute winter	CARPARK	3.000	IC03.01	-15.1	0.617	-0.356	0.4463	



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