Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	✓	Check Discharge Rate(s)	✓
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	✓
Winter CV	1.000	Additional Storage (m³/ha)	20.0	100 year 360 minute (m³)	

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 %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	0	0	0
30	0	0	0	100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	SPR	0.10	Betterment (%)	0
Greenfield Method	IH124	Region	1	QBar	
Positively Drained Area (ha)		Growth Factor 1 year	0.85	Q 1 year (l/s)	
SAAR (mm)		Growth Factor 30 year	1.95	Q 30 year (l/s)	
Soil Index	1	Growth Factor 100 year	2.48	Q 100 year (l/s)	

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)		Return Period (years)	100	PR	
Soil Index	1	Climate Change (%)	0	Runoff Volume (m³)	

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	10	Connection Type	Level Soffits
Additional Flow (%)	45	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	6.00	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)	Invert Level (m)
1	0.028	6.00	147.500	1200	441775.528	354714.306	1.473	146.027
2	0.000	6.00	147.500	1200	441797.776	354721.438	1.707	145.793
10	0.007	6.00	147.500	1200	441781.463	354695.934	1.667	145.833
3	0.005	6.00	147.500	1200	441803.670	354703.053	1.900	145.600
4	0.035	6.00	147.500	1200	441807.180	354692.107	2.090	145.410
11	0.031	6.00	147.500	1200	441794.813	354730.681	1.613	145.887
12	0.013	6.00	147.500	1200	441767.243	354721.842	1.903	145.597
14	0.025	6.00	147.500	1200	441797.104	354711.121	1.844	145.656
13	0.013	6.00	147.500	1200	441773.142	354703.439	2.171	145.329
5	0.014	6.00	147.500	1200	441779.516	354683.559	2.380	145.120
15	0.040	6.00	147.200	1200	441772.511	354657.907	2.613	144.587
6	0.081	6.00	147.200	1200	441765.634	354679.270	2.800	144.400
16	0.071	6.00	147.200	1200	441779.356	354653.281	2.262	144.938
17	0.053	6.00	147.200	1200	441745.534	354643.605	2.438	144.762
18	0.071	6.00	147.200	1200	441734.073	354679.070	2.699	144.501
19	0.039	6.00	147.200	1200	441722.612	354714.535	2.885	144.315
21	0.042	6.00	147.200	1200	441761.130	354654.225	2.553	144.647
22	0.040	6.00	147.200	1200	441751.161	354685.061	2.715	144.485
20	0.024	6.00	147.200	1350	441739.807	354720.181	3.125	144.075
7	0.000	6.00	147.200	1350	441751.253	354723.939	3.185	144.015
8	0.000		145.000	1350	441750.713	354737.288	1.052	143.948
9			144.480	1350	441749.640	354744.639	0.569	143.911

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	2	23.363	0.600	146.027	145.793	0.234	100.0	150	6.39	50.0
1.001	2	3	19.307	0.600	145.793	145.600	0.193	100.0	150	6.71	50.0
2.000	10	3	23.320	0.600	145.833	145.600	0.233	100.0	150	6.39	50.0
1.002	3	4	11.495	0.600	145.600	145.485	0.115	100.0	150	6.90	50.0
1.003	4	5	28.955	0.600	145.410	145.120	0.290	100.0	225	7.27	50.0
3.000	11	12	28.952	0.600	145.887	145.597	0.290	100.0	150	6.48	50.0
3.001	12	13	19.325	0.600	145.597	145.404	0.193	100.0	150	6.80	50.0
4.000	14	13	25.163	0.600	145.656	145.404	0.252	100.0	150	6.42	50.0

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	1.005	17.8	7.3	1.323	1.557	0.028	0.0	67	0.957
1.001	1.005	17.8	7.3	1.557	1.750	0.028	0.0	67	0.957
2.000	1.005	17.8	1.8	1.517	1.750	0.007	0.0	33	0.649
1.002	1.005	17.8	10.5	1.750	1.865	0.040	0.0	83	1.045
1.003	1.307	52.0	19.7	1.865	2.155	0.075	0.0	95	1.216
3.000	1.005	17.8	8.1	1.463	1.753	0.031	0.0	71	0.983
3.001	1.005	17.8	11.5	1.753	1.946	0.044	0.0	88	1.069
4.000	1.005	17.8	6.6	1.694	1.946	0.025	0.0	63	0.929

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

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)
3.002	13	5	20.877	0.600	145.329	145.120	0.209	100.0	225	7.07	50.0
1.004	5	6	14.529	0.600	145.120	144.475	0.645	22.5	225	7.36	50.0
5.000	15	6	22.443	0.600	144.587	144.475	0.112	200.0	225	6.41	50.0
1.005	6	7	46.927	0.600	144.400	144.165	0.235	200.0	300	8.06	50.0
6.000	16	17	35.179	0.600	144.938	144.762	0.176	200.0	225	6.64	50.0
6.001	17	18	37.271	0.600	144.762	144.576	0.186	200.0	225	7.31	50.0
6.002	18	19	37.271	0.600	144.501	144.315	0.186	200.0	300	7.87	50.0
6.003	19	20	18.098	0.600	144.315	144.225	0.090	200.0	300	8.14	50.0
7.000	21	22	32.407	0.600	144.647	144.485	0.162	200.0	225	6.59	50.0
7.001	22	20	36.910	0.600	144.485	144.300	0.185	200.0	225	7.25	50.0
6.004	20	7	12.047	0.600	144.075	144.015	0.060	200.0	450	8.28	50.0
1.006	7	8	13.360	0.600	144.015	143.948	0.067	200.0	450	8.44	50.0
1.007	8	9	7.429	0.600	143.948	143.911	0.037	200.0	450	8.53	50.0

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)
3.002	1.307	52.0	21.5	1.946	2.155	0.082	0.0	101	1.246
1.004	2.768	110.1	44.8	2.155	2.500	0.171	0.0	100	2.629
5.000	0.921	36.6	10.5	2.388	2.500	0.040	0.0	82	0.796
1.005	1.108	78.3	76.5	2.500	2.735	0.292	0.0	241	1.256
6.000	0.921	36.6	18.6	2.037	2.213	0.071	0.0	114	0.925
6.001	0.921	36.6	32.5	2.213	2.399	0.124	0.0	166	1.037
6.002	1.108	78.3	51.1	2.399	2.585	0.195	0.0	177	1.177
6.003	1.108	78.3	61.3	2.585	2.675	0.234	0.0	201	1.222
7.000	0.921	36.6	11.0	2.328	2.490	0.042	0.0	85	0.809
7.001	0.921	36.6	21.5	2.490	2.675	0.082	0.0	124	0.957
6.004	1.434	228.0	89.1	2.675	2.735	0.340	0.0	195	1.348
1.006	1.434	228.0	165.6	2.735	0.602	0.632	0.0	285	1.557
1.007	1.434	228.0	165.6	0.602	0.119	0.632	0.0	285	1.557

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	23.363	100.0	150	Circular_Default Sewer Type	147.500	146.027	1.323	147.500	145.793	1.557
1.001	19.307	100.0	150	Circular_Default Sewer Type	147.500	145.793	1.557	147.500	145.600	1.750
2.000	23.320	100.0	150	Circular_Default Sewer Type	147.500	145.833	1.517	147.500	145.600	1.750
1.002	11.495	100.0	150	Circular_Default Sewer Type	147.500	145.600	1.750	147.500	145.485	1.865
1.003	28.955	100.0	225	Circular_Default Sewer Type	147.500	145.410	1.865	147.500	145.120	2.155
3.000	28.952	100.0	150	Circular_Default Sewer Type	147.500	145.887	1.463	147.500	145.597	1.753
3.001	19.325	100.0	150	Circular_Default Sewer Type	147.500	145.597	1.753	147.500	145.404	1.946
4.000	25.163	100.0	150	Circular_Default Sewer Type	147.500	145.656	1.694	147.500	145.404	1.946
3.002	20.877	100.0	225	Circular_Default Sewer Type	147.500	145.329	1.946	147.500	145.120	2.155
1.004	14.529	22.5	225	Circular_Default Sewer Type	147.500	145.120	2.155	147.200	144.475	2.500

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1200	Manhole	Adoptable	2	1200	Manhole	Adoptable
1.001	2	1200	Manhole	Adoptable	3	1200	Manhole	Adoptable
2.000	10	1200	Manhole	Adoptable	3	1200	Manhole	Adoptable
1.002	3	1200	Manhole	Adoptable	4	1200	Manhole	Adoptable
1.003	4	1200	Manhole	Adoptable	5	1200	Manhole	Adoptable
3.000	11	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
3.001	12	1200	Manhole	Adoptable	13	1200	Manhole	Adoptable
4.000	14	1200	Manhole	Adoptable	13	1200	Manhole	Adoptable
3.002	13	1200	Manhole	Adoptable	5	1200	Manhole	Adoptable
1.004	5	1200	Manhole	Adoptable	6	1200	Manhole	Adoptable

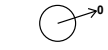
Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

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)
5.000	22.443	200.0	225	Circular_Default Sewer Type	147.200	144.587	2.388	147.200	144.475	2.500
1.005	46.927	200.0	300	Circular_Default Sewer Type	147.200	144.400	2.500	147.200	144.165	2.735
6.000	35.179	200.0	225	Circular_Default Sewer Type	147.200	144.938	2.037	147.200	144.762	2.213
6.001	37.271	200.0	225	Circular_Default Sewer Type	147.200	144.762	2.213	147.200	144.576	2.399
6.002	37.271	200.0	300	Circular_Default Sewer Type	147.200	144.501	2.399	147.200	144.315	2.585
6.003	18.098	200.0	300	Circular_Default Sewer Type	147.200	144.315	2.585	147.200	144.225	2.675
7.000	32.407	200.0	225	Circular_Default Sewer Type	147.200	144.647	2.328	147.200	144.485	2.490
7.001	36.910	200.0	225	Circular_Default Sewer Type	147.200	144.485	2.490	147.200	144.300	2.675
6.004	12.047	200.0	450	Circular_Default Sewer Type	147.200	144.075	2.675	147.200	144.015	2.735
1.006	13.360	200.0	450	Circular_Default Sewer Type	147.200	144.015	2.735	145.000	143.948	0.602
1.007	7.429	200.0	450	Circular_Default Sewer Type	145.000	143.948	0.602	144.480	143.911	0.119

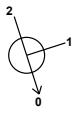
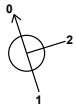
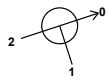
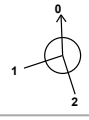
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
5.000	15	1200	Manhole	Adoptable	6	1200	Manhole	Adoptable
1.005	6	1200	Manhole	Adoptable	7	1350	Manhole	Adoptable
6.000	16	1200	Manhole	Adoptable	17	1200	Manhole	Adoptable
6.001	17	1200	Manhole	Adoptable	18	1200	Manhole	Adoptable
6.002	18	1200	Manhole	Adoptable	19	1200	Manhole	Adoptable
6.003	19	1200	Manhole	Adoptable	20	1350	Manhole	Adoptable
7.000	21	1200	Manhole	Adoptable	22	1200	Manhole	Adoptable
7.001	22	1200	Manhole	Adoptable	20	1350	Manhole	Adoptable
6.004	20	1350	Manhole	Adoptable	7	1350	Manhole	Adoptable
1.006	7	1350	Manhole	Adoptable	8	1350	Manhole	Adoptable
1.007	8	1350	Manhole	Adoptable	9	1350	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	441775.528	354714.306	147.500	1.473	1200		0	1.000	146.027	150
2	441797.776	354721.438	147.500	1.707	1200		1 0	1.000 1.001	145.793 145.793	150 150
10	441781.463	354695.934	147.500	1.667	1200		0	2.000	145.833	150
3	441803.670	354703.053	147.500	1.900	1200		1 2 0	2.000 1.001 1.002	145.600 145.600 145.600	150 150 150
4	441807.180	354692.107	147.500	2.090	1200		1 0	1.002 1.003	145.485 145.410	150 225
11	441794.813	354730.681	147.500	1.613	1200		0	3.000	145.887	150
12	441767.243	354721.842	147.500	1.903	1200		1 0	3.000 3.001	145.597 145.597	150 150

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
14	441797.104	354711.121	147.500	1.844	1200		0	4.000	145.656	150
13	441773.142	354703.439	147.500	2.171	1200		1	4.000	145.404	150
							2	3.001	145.404	150
							0	3.002	145.329	225
5	441779.516	354683.559	147.500	2.380	1200		1	3.002	145.120	225
							2	1.003	145.120	225
							0	1.004	145.120	225
15	441772.511	354657.907	147.200	2.613	1200		0	5.000	144.587	225
6	441765.634	354679.270	147.200	2.800	1200		1	5.000	144.475	225
							2	1.004	144.475	225
							0	1.005	144.400	300
16	441779.356	354653.281	147.200	2.262	1200		0	6.000	144.938	225
17	441745.534	354643.605	147.200	2.438	1200		1	6.000	144.762	225
							0	6.001	144.762	225
18	441734.073	354679.070	147.200	2.699	1200		1	6.001	144.576	225
							0	6.002	144.501	300
19	441722.612	354714.535	147.200	2.885	1200		1	6.002	144.315	300
							0	6.003	144.315	300
21	441761.130	354654.225	147.200	2.553	1200		0	7.000	144.647	225
22	441751.161	354685.061	147.200	2.715	1200		1	7.000	144.485	225
							0	7.001	144.485	225
20	441739.807	354720.181	147.200	3.125	1350		1	7.001	144.300	225
							2	6.003	144.225	300
							0	6.004	144.075	450
7	441751.253	354723.939	147.200	3.185	1350		1	6.004	144.015	450
							2	1.005	144.165	300
							0	1.006	144.015	450
8	441750.713	354737.288	145.000	1.052	1350		1	1.006	143.948	450
							0	1.007	143.948	450

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
9	441749.640	354744.639	144.480	0.569	1350	1	1.007	143.911	450



Node 7 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	144.015	Product Number	CTL-SHE-0071-3700-3100-3700
Design Depth (m)	3.100	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.7	Min Node Diameter (mm)	1200

Node 6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	144.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	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	85.0	0.0	1.000	85.0	0.0	1.001	0.0	0.0

Node 22 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	144.485
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	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	65.0	0.0	1.000	65.0	0.0	1.001	0.0	0.0

Node 18 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	144.501
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	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	66.0	0.0	1.000	66.0	0.0	1.001	0.0	0.0

Node 19 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	144.315
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	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	44.0	0.0	1.000	44.0	0.0	1.001	0.0	0.0

Node 20 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	144.075
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	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	26.0	0.0	1.000	26.0	0.0	1.001	0.0	0.0

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

Node 17 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	144.762
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	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	66.0	0.0	1.000	66.0	0.0	1.001	0.0	0.0

Node 21 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	144.647
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	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	56.0	0.0	1.000	56.0	0.0	1.001	0.0	0.0

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.61%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	146.070	0.043	3.1	0.0652	0.0000	OK
15 minute summer	2	11	145.835	0.042	3.1	0.0477	0.0000	OK
15 minute summer	10	11	145.855	0.022	0.8	0.0262	0.0000	OK
15 minute summer	3	12	145.653	0.052	4.4	0.0621	0.0000	OK
15 minute summer	4	12	145.470	0.060	8.0	0.0876	0.0000	OK
15 minute summer	11	11	145.931	0.044	3.4	0.0672	0.0000	OK
15 minute summer	12	11	145.651	0.054	4.8	0.0687	0.0000	OK
15 minute summer	14	11	145.696	0.040	2.7	0.0560	0.0000	OK
15 minute summer	13	11	145.393	0.064	8.8	0.0800	0.0000	OK
15 minute summer	5	12	145.185	0.065	18.1	0.0809	0.0000	OK
600 minute summer	15	495	144.665	0.078	1.0	0.1121	0.0000	OK
600 minute summer	6	495	144.665	0.265	7.7	22.9773	0.0000	OK
15 minute summer	16	10	145.015	0.077	7.8	0.1347	0.0000	OK
30 minute summer	17	22	144.827	0.065	13.0	4.4020	0.0000	OK
600 minute summer	18	495	144.665	0.164	4.6	11.0948	0.0000	OK
600 minute summer	19	495	144.665	0.350	5.4	15.8895	0.0000	SURCHARGED
120 minute summer	21	70	144.682	0.035	2.7	1.9934	0.0000	OK
600 minute summer	22	465	144.665	0.180	4.5	11.9550	0.0000	OK
600 minute summer	20	495	144.665	0.590	4.6	16.2740	0.0000	SURCHARGED
600 minute summer	7	495	144.665	0.650	5.0	0.9301	0.0000	SURCHARGED
15 minute winter	8	155	143.980	0.032	2.2	0.0463	0.0000	OK
15 minute summer	9	154	143.941	0.030	2.2	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)	Discharge Vol (m³)
15 minute summer	1	1.000	2	3.1	0.754	0.175	0.0962	
15 minute summer	2	1.001	3	3.1	0.660	0.173	0.0918	
15 minute summer	10	2.000	3	0.8	0.248	0.044	0.0814	
15 minute summer	3	1.002	4	4.3	0.812	0.244	0.0613	
15 minute summer	4	1.003	5	8.0	0.894	0.154	0.2587	
15 minute summer	11	3.000	12	3.4	0.682	0.191	0.1458	
15 minute summer	12	3.001	13	4.7	0.839	0.265	0.1085	
15 minute summer	14	4.000	13	2.7	0.722	0.151	0.0935	
15 minute summer	13	3.002	5	8.7	0.941	0.168	0.1946	
15 minute summer	5	1.004	6	18.2	1.996	0.165	0.1326	
600 minute summer	15	5.000	6	1.0	0.408	0.027	0.5385	
600 minute summer	6	1.005	7	5.0	0.459	0.064	3.1975	
15 minute summer	16	6.000	17	7.9	1.062	0.217	0.3091	
30 minute summer	17	6.001	18	6.6	0.698	0.179	0.3497	
600 minute summer	18	6.002	19	4.5	0.440	0.057	2.0464	
600 minute summer	19	6.003	20	4.0	0.437	0.051	1.2744	
120 minute summer	21	7.000	22	1.9	0.427	0.052	0.3174	
600 minute summer	22	7.001	20	-2.6	0.359	-0.070	1.3624	
600 minute summer	20	6.004	7	3.2	0.046	0.014	1.9088	
600 minute summer	7	1.006	8	2.2	0.450	0.010	0.0661	
15 minute winter	8	1.007	9	2.2	0.467	0.010	0.0354	31.0

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	146.118	0.091	11.4	0.1371	0.0000	OK
15 minute summer	2	11	145.881	0.088	11.4	0.0999	0.0000	OK
15 minute summer	10	11	145.874	0.041	2.9	0.0497	0.0000	OK
15 minute summer	3	12	145.723	0.123	16.4	0.1459	0.0000	OK
15 minute summer	4	11	145.537	0.127	30.2	0.1868	0.0000	OK
15 minute summer	11	11	145.980	0.093	12.6	0.1407	0.0000	OK
15 minute summer	12	11	145.730	0.133	17.9	0.1691	0.0000	OK
15 minute summer	14	11	145.740	0.084	10.2	0.1180	0.0000	OK
15 minute summer	13	11	145.468	0.139	33.0	0.1736	0.0000	OK
15 minute summer	5	11	145.263	0.143	68.7	0.1792	0.0000	OK
600 minute winter	15	585	145.151	0.564	1.6	0.8100	0.0000	SURCHARGED
600 minute winter	6	585	145.151	0.751	11.5	65.0955	0.0000	SURCHARGED
600 minute winter	16	585	145.151	0.213	2.8	0.3746	0.0000	OK
600 minute winter	17	585	145.151	0.389	5.1	26.2818	0.0000	SURCHARGED
600 minute winter	18	585	145.151	0.650	7.6	43.9771	0.0000	SURCHARGED
600 minute winter	19	585	145.151	0.836	4.8	37.9604	0.0000	SURCHARGED
600 minute winter	21	585	145.152	0.505	3.8	28.9927	0.0000	SURCHARGED
600 minute winter	22	585	145.152	0.667	6.4	44.2745	0.0000	SURCHARGED
600 minute winter	20	585	145.152	1.077	7.0	27.7198	0.0000	SURCHARGED
600 minute winter	7	600	145.151	1.136	8.1	1.6250	0.0000	SURCHARGED
600 minute winter	8	585	143.981	0.033	2.3	0.0470	0.0000	OK
600 minute winter	9	585	143.942	0.031	2.3	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)
15 minute summer	1	1.000	2	11.4	1.040	0.642	0.2561	
15 minute summer	2	1.001	3	11.5	0.874	0.646	0.2526	
15 minute summer	10	2.000	3	2.9	0.329	0.163	0.2247	
15 minute summer	3	1.002	4	16.1	1.091	0.909	0.1698	
15 minute summer	4	1.003	5	30.1	1.228	0.579	0.7224	
15 minute summer	11	3.000	12	12.6	0.911	0.710	0.4053	
15 minute summer	12	3.001	13	17.6	1.115	0.989	0.3082	
15 minute summer	14	4.000	13	10.2	1.024	0.574	0.2503	
15 minute summer	13	3.002	5	32.9	1.289	0.633	0.5469	
15 minute summer	5	1.004	6	68.9	2.712	0.626	0.4344	
600 minute winter	15	5.000	6	1.5	0.365	0.042	0.8926	
600 minute winter	6	1.005	7	8.1	0.475	0.103	3.3046	
600 minute winter	16	6.000	17	2.8	0.452	0.076	1.3843	
600 minute winter	17	6.001	18	4.8	0.575	0.131	1.4823	
600 minute winter	18	6.002	19	3.9	0.409	0.050	2.6246	
600 minute winter	19	6.003	20	-2.6	0.434	-0.033	1.2744	
600 minute winter	21	7.000	22	-2.1	0.289	-0.058	1.2889	
600 minute winter	22	7.001	20	-4.8	0.346	-0.131	1.4680	
600 minute winter	20	6.004	7	-6.0	-0.038	-0.026	1.9088	
600 minute winter	7	1.006	8	2.3	0.454	0.010	0.0677	
600 minute winter	8	1.007	9	2.3	0.470	0.010	0.0364	102.0

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.36%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	146.136	0.109	14.6	0.1642	0.0000	OK
15 minute summer	2	12	145.904	0.111	14.6	0.1259	0.0000	OK
15 minute summer	10	11	145.879	0.046	3.6	0.0556	0.0000	OK
15 minute summer	3	12	145.791	0.191	20.3	0.2259	0.0000	SURCHARGED
15 minute summer	4	11	145.559	0.149	37.8	0.2189	0.0000	OK
15 minute summer	11	12	146.071	0.184	16.1	0.2787	0.0000	SURCHARGED
15 minute summer	12	11	145.833	0.236	22.0	0.2997	0.0000	SURCHARGED
15 minute summer	14	11	145.755	0.099	13.0	0.1390	0.0000	OK
15 minute summer	13	11	145.492	0.163	40.9	0.2043	0.0000	OK
600 minute winter	5	585	145.410	0.290	8.9	0.3627	0.0000	SURCHARGED
600 minute winter	15	585	145.410	0.823	2.1	1.1831	0.0000	SURCHARGED
600 minute winter	6	600	145.411	1.011	15.1	86.7705	0.0000	SURCHARGED
600 minute winter	16	600	145.412	0.474	3.7	0.8332	0.0000	SURCHARGED
600 minute winter	17	600	145.412	0.650	6.4	43.8868	0.0000	SURCHARGED
600 minute winter	18	600	145.412	0.910	8.5	61.5995	0.0000	SURCHARGED
600 minute winter	19	600	145.411	1.096	5.0	45.5577	0.0000	SURCHARGED
600 minute winter	21	600	145.411	0.764	4.4	43.9039	0.0000	SURCHARGED
600 minute winter	22	600	145.411	0.926	7.1	61.5083	0.0000	SURCHARGED
600 minute winter	20	600	145.411	1.336	8.0	28.1309	0.0000	SURCHARGED
600 minute winter	7	600	145.411	1.396	8.9	1.9970	0.0000	SURCHARGED
600 minute winter	8	585	143.982	0.034	2.5	0.0491	0.0000	OK
600 minute winter	9	585	143.944	0.033	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)
15 minute summer	1	1.000	2	14.6	1.088	0.823	0.3166	
15 minute summer	2	1.001	3	14.2	0.907	0.799	0.3053	
15 minute summer	10	2.000	3	3.6	0.344	0.203	0.2582	
15 minute summer	3	1.002	4	20.0	1.140	1.125	0.1939	
15 minute summer	4	1.003	5	37.5	1.274	0.722	0.8643	
15 minute summer	11	3.000	12	15.3	0.959	0.860	0.5097	
15 minute summer	12	3.001	13	21.1	1.200	1.188	0.3287	
15 minute summer	14	4.000	13	13.0	1.078	0.731	0.3030	
15 minute summer	13	3.002	5	40.8	1.314	0.785	0.6535	
600 minute winter	5	1.004	6	8.9	1.167	0.081	0.5778	
600 minute winter	15	5.000	6	2.0	0.366	0.055	0.8926	
600 minute winter	6	1.005	7	8.9	0.500	0.114	3.3046	
600 minute winter	16	6.000	17	3.7	0.473	0.101	1.3991	
600 minute winter	17	6.001	18	5.3	0.575	0.145	1.4823	
600 minute winter	18	6.002	19	3.4	0.437	0.043	2.6246	
600 minute winter	19	6.003	20	2.4	0.463	0.030	1.2744	
600 minute winter	21	7.000	22	-2.4	0.273	-0.065	1.2889	
600 minute winter	22	7.001	20	-5.3	0.356	-0.145	1.4680	
600 minute winter	20	6.004	7	-6.8	0.052	-0.030	1.9088	
600 minute winter	7	1.006	8	2.5	0.467	0.011	0.0725	
600 minute winter	8	1.007	9	2.5	0.479	0.011	0.0393	109.6

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	1	272	147.225	1.198	3.1	1.8097	0.0000	FLOOD RISK
360 minute winter	2	272	147.221	1.428	3.1	1.6148	0.0000	FLOOD RISK
360 minute winter	10	272	147.221	1.388	0.9	1.6859	0.0000	FLOOD RISK
360 minute winter	3	272	147.216	1.616	4.5	1.9136	0.0000	FLOOD RISK
360 minute winter	4	272	147.211	1.801	8.4	2.6405	0.0000	FLOOD RISK
360 minute winter	11	272	147.223	1.336	3.4	2.0246	0.0000	FLOOD RISK
360 minute winter	12	272	147.216	1.619	4.8	2.0527	0.0000	FLOOD RISK
360 minute winter	14	272	147.215	1.559	2.8	2.1855	0.0000	FLOOD RISK
360 minute winter	13	272	147.211	1.882	9.0	2.3545	0.0000	FLOOD RISK
360 minute winter	5	272	147.207	2.087	18.8	2.6061	0.0000	FLOOD RISK
960 minute winter	15	645	147.200	2.613	2.0	3.7549	3.1200	FLOOD
720 minute winter	6	495	147.200	2.800	18.0	89.8305	49.1495	FLOOD
480 minute winter	16	336	147.200	2.262	6.2	3.9789	3.9935	FLOOD
600 minute winter	17	420	147.200	2.438	18.5	69.8509	6.0324	FLOOD
360 minute winter	18	272	147.200	2.699	18.5	70.5052	2.2736	FLOOD
480 minute summer	19	328	147.200	2.885	15.6	48.0639	3.8146	FLOOD
480 minute winter	21	336	147.200	2.553	14.4	59.7554	3.4250	FLOOD
600 minute summer	22	405	147.200	2.715	15.3	68.9041	3.0871	FLOOD
480 minute summer	20	328	147.200	3.125	22.8	30.9661	2.0790	FLOOD
480 minute winter	7	336	147.200	3.185	19.6	4.5577	1.3660	FLOOD
600 minute summer	8	405	143.990	0.041	3.7	0.0593	0.0000	OK
600 minute summer	9	405	143.951	0.040	3.7	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)
360 minute winter	1	1.000	2	3.1	0.751	0.174	0.4113	
360 minute winter	2	1.001	3	3.1	0.639	0.174	0.3399	
360 minute winter	10	2.000	3	0.8	0.237	0.045	0.4105	
360 minute winter	3	1.002	4	4.5	0.819	0.252	0.2024	
360 minute winter	4	1.003	5	8.4	0.936	0.161	1.1516	
360 minute winter	11	3.000	12	3.4	0.671	0.191	0.5097	
360 minute winter	12	3.001	13	4.8	0.842	0.270	0.3402	
360 minute winter	14	4.000	13	2.8	0.730	0.157	0.4430	
360 minute winter	13	3.002	5	9.0	0.970	0.173	0.8303	
360 minute winter	5	1.004	6	18.8	1.313	0.171	0.5778	
960 minute winter	15	5.000	6	1.9	0.321	0.052	0.8926	
720 minute winter	6	1.005	7	13.0	0.532	0.167	3.3046	
480 minute winter	16	6.000	17	6.0	0.547	0.163	1.3991	
600 minute winter	17	6.001	18	-13.0	0.572	-0.355	1.4823	
360 minute winter	18	6.002	19	-14.5	0.534	-0.185	2.6246	
480 minute summer	19	6.003	20	15.0	0.479	0.191	1.2744	
480 minute winter	21	7.000	22	-11.9	-0.300	-0.326	1.2889	
600 minute summer	22	7.001	20	-12.6	0.341	-0.344	1.4680	
480 minute summer	20	6.004	7	-20.8	-0.131	-0.091	1.9088	
480 minute winter	7	1.006	8	3.7	0.522	0.016	0.0955	
600 minute summer	8	1.007	9	3.7	0.531	0.016	0.0521	140.5

Water Quality (TSS)

Node	Treatment	Effectiveness	SuDS Component	Mitigation TSS	Cumulative TSS
6	Depth/Area	1.0	Pond	0.700	0.000
17	Depth/Area	1.0	Pond	0.700	0.000
18	Depth/Area	1.0	Pond	0.700	0.000
19	Depth/Area	1.0	Pond	0.700	0.000
21	Depth/Area	1.0	Pond	0.700	0.000
22	Depth/Area	1.0	Pond	0.700	0.000
20	Depth/Area	1.0	Pond	0.700	0.000

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd

Water Quality (TSS)

Node	Treatment	Effectiveness	SuDS Component	Mitigation TSS	Cumulative TSS
9					0.000

Water Quality (Metals)

Node	Treatment	Effectiveness	SuDS Component	Mitigation Metals	Cumulative Metals
6	Depth/Area	1.0	Pond	0.700	0.000
17	Depth/Area	1.0	Pond	0.700	0.000
18	Depth/Area	1.0	Pond	0.700	0.000
19	Depth/Area	1.0	Pond	0.700	0.000
21	Depth/Area	1.0	Pond	0.700	0.000
22	Depth/Area	1.0	Pond	0.700	0.000
20	Depth/Area	1.0	Pond	0.700	0.000
9					0.000

Water Quality (Hydrocarbons)

Node	Treatment	Effectiveness	SuDS Component	Mitigation Hydrocarbons	Cumulative Hydrocarbons
6	Depth/Area	1.0	Pond	0.500	0.000
17	Depth/Area	1.0	Pond	0.500	0.000
18	Depth/Area	1.0	Pond	0.500	0.000
19	Depth/Area	1.0	Pond	0.500	0.000
21	Depth/Area	1.0	Pond	0.500	0.000
22	Depth/Area	1.0	Pond	0.500	0.000
20	Depth/Area	1.0	Pond	0.500	0.000
9					0.000

Flow v18.0 Copyright © 1988-2026 Causeway Technologies Ltd