Manchester Business Park

DISCHARGE OF CONDITION 35

Drainage Technical Note

DOCUMENT CONTROL SHEET

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Client: Ask Real Estate

Project: Manchester Business Park

Document No: 30456-BGL-XX-XX-TN-D-00003

Title: Discharge of Condition 35

Status: P01

Date: 23/07/2026

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Checked By: Jack Williams, Civils Director, CEng MICE MCIHT

Document Revision Record

Version Number	Date	Revision Details
P01	23/07/2026	First Issue

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Introduction

Planning permission for the development of the site was granted by Manchester City Council in December 2025, planning application ref. 144691/FO/2025. This included the approval of a drainage strategy set out in Renaissance 'Drainage Strategy' ref. MBP-REN-00-ZZ-RP-C-00002 dated December 2025. Following the grant of the planning permission, the detailed design and layout of the development has been progressed to discharge the relevant planning conditions, alongside the detailed design for the surface water drainage. This note and accompanying documents have been produced to provide the final surface water drainage details to support the discharge of condition 35.

Condition 35

Prior to the commencement of the development hereby approved, a surface water drainage scheme in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards, shall be submitted for approval in writing by the City Council, as Local Planning Authority.

The development shall be constructed and completed in accordance with the approved details prior to the first occupation/use of the development.

Reason: To promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution pursuant to national policies within the NPPF and NPPG and Core Strategy policies EN8 and EN14.to be installed.

Surface Water Drainage Scheme

The surface water drainage strategy has been produced in accordance with the approved Drainage Strategy report, national and local policy. A summary of the key drainage principles from the approved strategy, of which have been adhered to, are as follows;

- Infiltration was not considered to be a feasible method for discharge of the surface water due to the expected ground conditions. Further investigation has been undertaken as part of the Phase 2 assessment of which BRE digest 365 soakaway testing has been carried out. The fastest infiltration rate achieved was -1.66x10^{-7} m/sec. Due to the significantly poor infiltration rates of the site, it can be confirmed that soakaway drainage is not a suitable method of discharge for this site.
- The proposed method of discharge is to direct all runoff towards the 300mm surface water sewer, in line with the approved design. A survey has been undertaken to locate this sewer which proves a buried chamber is located towards the northwest of the site.
- Surface water flows shall be restricted to greenfield runoff rates (QBAR) which is calculated as 13.6 l/s for the developed area.
- A climate change allowance of 45% has been allowed for in the hydraulic design of the system, the system has been designed as such that no surface flooding occurs for all storm events up to and including the 1:100 year +45% climate change.
- Attenuation shall be provided in the form of permeable paving systems in the car parking areas and underground geo-cellular attenuation tanks. Sufficient attenuation is provided onsite to attenuate for all storms up to and including the 1:100 year +40% climate change allowance.
- The SuDS techniques which have been assessed as suitable in the approved drainage strategy have been implemented on the scheme. The drainage strategy includes appropriate proprietary systems, trees, pervious paving and attenuation storage within tanks and the piped network.

- Surface water runoff from the development results in a low-medium pollution hazard. Inline with CIRIA C753, suitable measures have been implemented to mitigate the risk of pollution form the developments runoff, there are as follows;

- All runoff from the car parking bays has a low risk and will pass through permeable paving, a bypass separator and a smartceptor prior to outfall.

- All runoff from the service yard areas has a low risk and will pass through permeable paving, a bypass separator and a smartceptor prior to outfall.

-All runoff from the roof areas has a low risk and will pass through a bypass separator and the smartceptor prior to outfall.

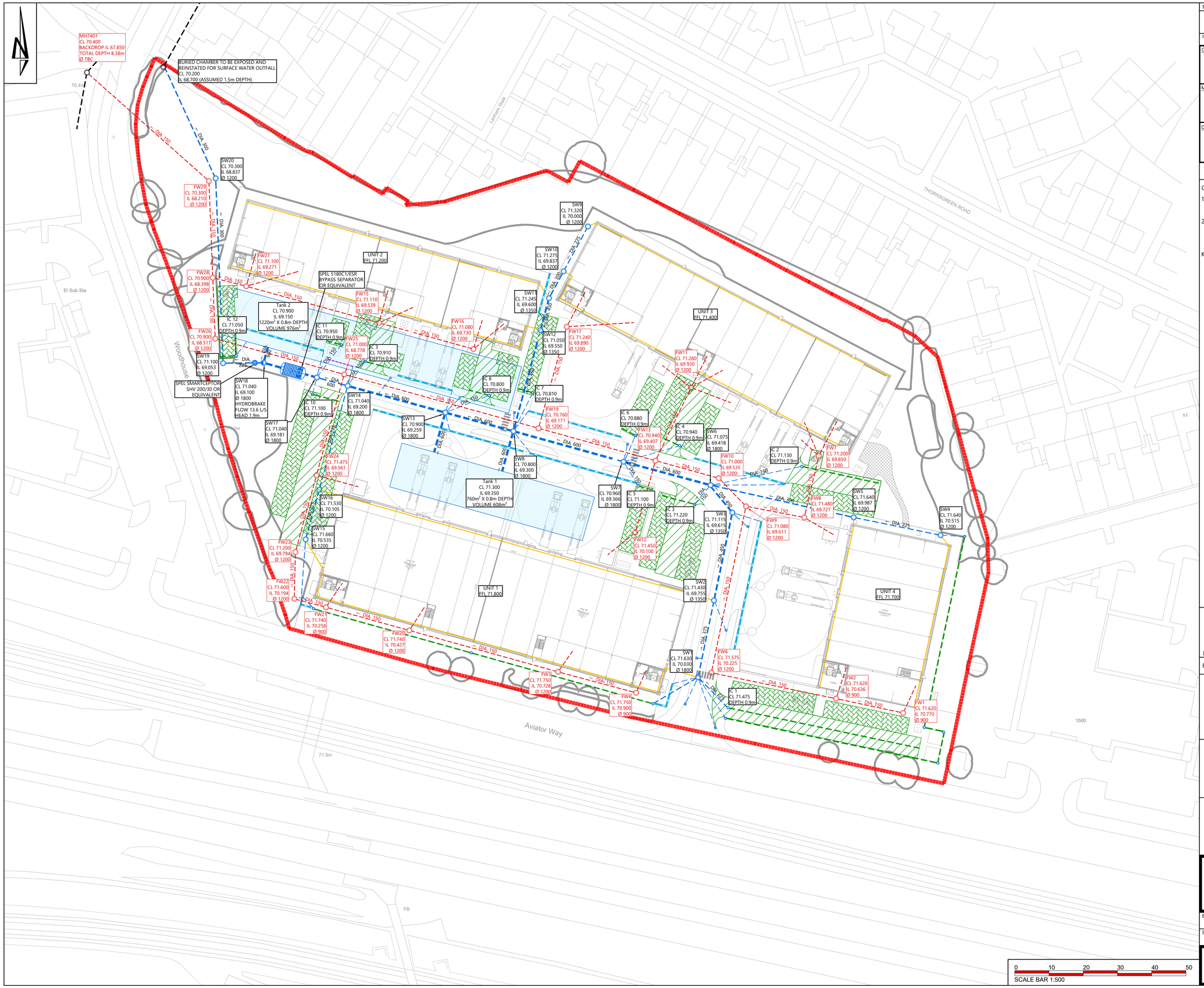
- Silt will be prevented from entering the system by the use of channels with silt traps and catch pits where required.

Prior to outfall all runoff shall pass through multiple stages of treatment before leaving the site, ensuring sufficient treatment is provided in line with CIRIA C753 guidance.

- Maintenance for the drainage network shall be carried out in accordance with the approved SuDS maintenance and management plan included within the approved drainage strategy.

The revised drainage strategy with accompanying hydraulic calculations are included within the appendices of this document.

APPENDIX A – BELOW GROUND DRAINAGE GENERAL ARRANGEMENT



THIS DRAWING IS THE COPYRIGHT OF BURROWS GRAHAM LIMITED.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING

CONSTRUCTION

MAINTENANCE

DEMOLITION

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT

GENERAL NOTES:

1. This drawing shall be read in conjunction with all the relevant architects, engineers' and service engineers drawings & specifications.
2. All units in millimeters U.O.N. on the drawing. Do not scale off the drawing.

KEY:

- Surface Water drainage
- Siphonic Roof Drainage (by others)
- Channel Drain
- Kerb Drain
- Foul Water Drainage
- Existing Drainage
- Watercourse Diversion (to be confirmed)
- Filter Drain with 600dia inspection chambers (IC)
- Permeable Paving
- Underground Attenuation Tank

REV	DATE	BY	DESCRIPTION	CHKD
P01	23.07.2026	BP	Issued for Information	JW

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CLIENT

ask

PROJECT

MANCHESTER BUSINESS PARK

DRAWING TITLE

BELOW GROUND DRAINAGE GENERAL ARRANGEMENT

BGL PROJECT NUMBER	DRAWING STATUS	OFFICE	
30546	PRELIMINARY	NORTH	
SCALE @ A1	DATE	DRAWN BY	CHECKED BY
1:500	23.07.2026	BP	JW

DRAWING No

30546-BGL-XX-XX-DR-C-00001

REV

P01

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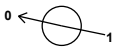
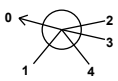
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APPENDIX B – HYDRAULIC CALCULATIONS

Design Settings

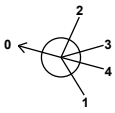
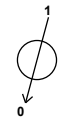
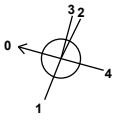
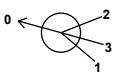
Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	45	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	0.900
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
CP1	382678.158	385538.769	71.475	0.350			0 1.000	71.125	225
1	382669.361	385547.702	71.630	1.600	1350		1 1.000	70.255	225
							0 1.001	70.030	375
2	382673.976	385570.110	71.430	1.675	1350		1 1.001	69.830	375
							0 1.002	69.755	450
3	382679.336	385595.772	71.115	1.500	1350		1 1.002	69.615	450
							0 1.003	69.615	450
4	382740.154	385589.159	71.640	1.125	1200		0 2.000	70.515	225
5	382714.768	385594.367	71.640	1.653	1200		1 2.000	70.362	225
							0 2.001	69.987	300
CP2	382699.652	385609.225	71.130	0.350			0 3.000	70.780	150
CP3	382668.335	385598.196	71.220	0.350			0 4.000	70.870	150
6	382672.974	385603.790	71.075	1.657	1350		1 4.000	69.868	150
							2 3.000	69.868	150
							3 2.001	69.718	300
							4 1.003	69.568	450
							0 1.004	69.418	600
CP4	382663.978	385615.296	70.940	0.350			0 5.000	70.590	150

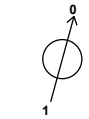
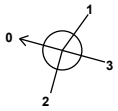
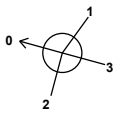
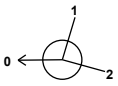
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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
CP6	382651.045	385618.291	70.880	0.350		 0	6.000	70.530	150
CP5	382651.926	385603.540	71.100	0.350		 0	7.000	70.750	150
7	382647.564	385610.629	70.960	1.594	1500	 1	7.000	69.816	150
						2	6.000	69.816	150
						3	5.000	69.816	150
						4	1.004	69.366	600
						0	1.005	69.366	600
9	382637.179	385679.327	71.320	1.320	1200	 0	8.000	70.000	225
10	382630.065	385666.229	71.275	1.438	1200	 1	8.000	69.912	225
						0	8.001	69.837	300
11	382625.804	385658.383	71.245	1.645	1350	 1	8.001	69.750	300
						0	8.002	69.600	450
12	382623.294	385649.058	71.050	1.500	1350	 1	8.002	69.550	450
						0	8.003	69.550	450
CP7	382620.994	385630.804	70.810	0.350		 0	9.000	70.460	150
8	382615.395	385619.459	70.800	1.500	1500	 1	10.000	69.300	600
						2	9.000	69.750	150
						3	8.003	69.450	450
						4	1.005	69.300	600
						0	1.006	69.300	600
CP8	382608.294	385629.998	70.800	0.350		 0	11.000	70.450	150
13	382595.515	385624.974	70.900	1.641	1500	 1	12.000	69.259	600
						2	11.000	69.709	150
						3	1.006	69.259	600
						0	1.007	69.259	600
Tank 1	382612.040	385611.006	71.300	1.950		 0-1	10.000	69.350	600
						0-2	12.000	69.350	600

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
15	382554.716	385587.921	71.660	1.125	1200				
						0	13.000	70.535	225
16	382558.690	385602.446	71.530	1.425	1200		1	13.000	70.405	225
							0	13.001	70.105	225
14	382566.990	385632.778	71.040	1.840	1500		1	14.000	69.650	150
							2	13.001	69.575	225
							3	1.007	69.200	600
							0	1.008	69.200	600
CP10	382556.711	385630.340	71.100	0.350					
						0	15.000	70.750	150
17	382558.014	385635.234	71.040	1.859	1800		1	16.000	69.631	150
							2	15.000	69.631	150
							3	1.008	69.181	600
							0	1.009	69.181	600
CP12	382534.416	385641.596	71.050	0.350					
						0	17.000	70.700	150
Tank 2	382546.498	385653.080	70.900	1.750			1	17.000	69.600	150
							0	17.001	69.150	600
18	382542.446	385639.531	71.040	1.940	1800		1	17.001	69.100	600
							2	1.009	69.100	600
							0	1.010	69.100	225
19	382530.613	385639.404	71.100	2.047	1800		1	1.010	69.053	225
							0	1.011	69.053	225
20	382528.461	385693.391	70.300	1.463	1800		1	1.011	68.837	225
OUTFALL	382512.530	385722.191	70.200		1200				
CP9	382572.120	385639.904	70.910	0.350					
						0	14.000	70.560	150
CP11	382565.024	385644.911	70.950	0.350					
						0	16.000	70.600	150

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Simulation Settings

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

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 %)
1	0	0	0
30	40	0	0
100	45	0	0

Node 18 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.010	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0154-1360-1900-1360
Invert Level (m)	69.100	Min Outlet Diameter (m)	0.225
Design Depth (m)	1.900	Min Node Diameter (mm)	1500
Design Flow (l/s)	13.6		

Node Tank 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	69.150
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.90	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	1220.0	0.0	0.800	1220.0	0.0	0.801	0.0	0.0

Node CP1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	71.125	Slope (1:X)	40.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	7	Depth (m)	0.250
Safety Factor	2.0	Width (m)	11.000	Inf Depth (m)	
Porosity	0.30	Length (m)	57.000		

Node CP3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.870	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	6	Depth (m)	0.250
Safety Factor	2.0	Width (m)	16.000	Inf Depth (m)	
Porosity	0.30	Length (m)	22.750		

Node CP2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.780	Slope (1:X)	30.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	6	Depth (m)	0.250
Safety Factor	2.0	Width (m)	11.000	Inf Depth (m)	
Porosity	0.30	Length (m)	27.000		

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Node CP4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.590	Slope (1:X)	48.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	6	Depth (m)	0.250
Safety Factor	2.0	Width (m)	15.500	Inf Depth (m)	
Porosity	0.30	Length (m)	19.500		

Node CP6 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.530	Slope (1:X)	48.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	6	Depth (m)	0.250
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	17.500		

Node CP5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.750	Slope (1:X)	38.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.250
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	20.500		

Node CP7 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.460	Slope (1:X)	49.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	6	Depth (m)	0.250
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	23.000		

Node CP8 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.450	Slope (1:X)	41.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	6	Depth (m)	0.250
Safety Factor	2.0	Width (m)	16.000	Inf Depth (m)	
Porosity	0.30	Length (m)	14.000		

Node CP10 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.750	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	7	Depth (m)	0.250
Safety Factor	2.0	Width (m)	16.500	Inf Depth (m)	
Porosity	0.30	Length (m)	39.000		

Node CP9 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.560	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	6	Depth (m)	0.250
Safety Factor	2.0	Width (m)	16.000	Inf Depth (m)	
Porosity	0.30	Length (m)	11.000		

Node CP11 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.600	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	3	Depth (m)	0.250
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	7.500		

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Node Tank 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	69.350
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	760.0	0.0	0.800	760.0	0.0	0.801	0.0	0.0

Node CP12 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.700	Slope (1:X)	60.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	3	Depth (m)	0.250
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	1.00	Length (m)	20.000		

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Results for 1 year Critical Storm Duration. Lowest mass balance: 90.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	CP1	10	71.170	0.045	9.5	0.2684	0.0000	OK
15 minute winter	1	10	70.125	0.095	25.0	0.3228	0.0000	OK
15 minute winter	2	10	69.875	0.120	36.0	0.3374	0.0000	OK
15 minute winter	3	11	69.777	0.162	52.0	0.5872	0.0000	OK
15 minute winter	4	10	70.590	0.075	9.5	0.2102	0.0000	OK
15 minute winter	5	11	70.077	0.090	16.8	0.1853	0.0000	OK
15 minute winter	CP2	10	70.816	0.036	4.3	0.1117	0.0000	OK
15 minute winter	CP3	11	70.902	0.032	4.2	0.1787	0.0000	OK
15 minute winter	6	11	69.661	0.243	84.4	0.5815	0.0000	OK
15 minute winter	CP4	11	70.624	0.034	4.1	0.1614	0.0000	OK
15 minute winter	CP6	10	70.553	0.023	1.8	0.0401	0.0000	OK
15 minute summer	CP5	1	70.750	0.000	0.0	0.0000	0.0000	OK
15 minute winter	7	11	69.621	0.255	104.2	0.9332	0.0000	OK
15 minute winter	9	10	70.091	0.091	12.7	0.2757	0.0000	OK
15 minute winter	10	10	69.944	0.107	25.2	0.3082	0.0000	OK
15 minute winter	11	10	69.735	0.135	34.2	0.3474	0.0000	OK
15 minute winter	12	11	69.703	0.153	43.1	0.4090	0.0000	OK
15 minute winter	CP7	10	70.487	0.027	2.5	0.0560	0.0000	OK
15 minute winter	8	11	69.541	0.241	158.8	0.7741	0.0000	OK
15 minute winter	CP8	11	70.479	0.029	2.8	0.1087	0.0000	OK
15 minute winter	13	11	69.479	0.220	112.9	0.8797	0.0000	OK
30 minute winter	Tank 1	28	69.407	0.057	75.6	43.0471	0.0000	OK
15 minute winter	15	10	70.604	0.069	9.4	0.1937	0.0000	OK
15 minute winter	16	11	70.183	0.078	17.0	0.1733	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	CP1	1.000	1	9.2	1.668	0.085	0.1106	
15 minute winter	1	1.001	2	24.5	1.161	0.131	0.4842	
15 minute winter	2	1.002	3	35.9	0.846	0.152	1.1166	
15 minute winter	3	1.003	6	52.0	1.082	0.238	0.4924	
15 minute winter	4	2.000	5	9.2	0.810	0.230	0.2935	
15 minute winter	5	2.001	6	16.6	0.957	0.189	0.7438	
15 minute winter	CP2	3.000	6	4.2	1.269	0.128	0.0896	
15 minute winter	CP3	4.000	6	4.0	1.444	0.100	0.0553	
15 minute winter	6	1.004	7	84.2	0.762	0.277	2.9083	
15 minute winter	CP4	5.000	7	3.9	1.308	0.111	0.0597	
15 minute winter	CP6	6.000	7	1.7	1.004	0.052	0.0347	
15 minute summer	CP5	7.000	7	0.0	0.000	0.000	0.0000	
15 minute winter	7	1.005	8	102.9	0.950	0.338	3.6703	
15 minute winter	9	8.000	10	12.4	0.864	0.311	0.2141	
15 minute winter	10	8.001	11	24.8	1.189	0.226	0.1868	
15 minute winter	11	8.002	12	33.8	0.781	0.145	0.4229	
15 minute winter	12	8.003	8	43.2	0.955	0.235	1.3858	
15 minute winter	CP7	9.000	8	2.4	1.099	0.071	0.0436	
15 minute winter	8	1.006	13	92.8	0.931	0.304	2.0575	
15 minute winter	CP8	11.000	13	2.7	1.160	0.079	0.0469	
15 minute winter	13	1.007	14	68.4	0.691	0.224	3.0243	
15 minute winter	Tank 1	10.000	8	-66.2	-1.458	-0.193	1.0830	
15 minute winter	Tank 1	12.000	13	-43.6	-1.065	-0.098	1.0478	
15 minute winter	15	13.000	16	9.2	0.916	0.190	0.1512	
15 minute winter	16	13.001	14	16.7	1.398	0.248	0.3766	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 90.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	14	11	69.450	0.250	89.6	0.4914	0.0000	OK
15 minute winter	CP10	11	70.795	0.045	8.5	0.3386	0.0000	OK
15 minute winter	17	11	69.409	0.228	105.5	0.7572	0.0000	OK
15 minute winter	CP12	11	70.718	0.018	1.4	0.0507	0.0000	OK
480 minute winter	Tank 2	368	69.316	0.166	21.2	182.0990	0.0000	OK
15 minute winter	18	11	69.363	0.263	105.5	0.6698	0.0000	SURCHARGED
15 minute winter	19	12	69.148	0.095	11.8	0.2409	0.0000	OK
15 minute winter	20	12	68.926	0.089	11.7	0.0000	0.0000	OK
	OUTFALL							
15 minute winter	CP9	11	70.587	0.027	2.8	0.1524	0.0000	OK
15 minute winter	CP11	11	70.616	0.016	1.2	0.0244	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	14	1.008	17	89.2	0.863	0.328	1.2526	
15 minute winter	CP10	15.000	17	8.2	1.841	0.193	0.0888	
15 minute winter	17	1.009	18	105.5	0.978	0.217	1.7509	
15 minute winter	CP12	17.000	Tank 2	1.3	1.153	0.029	0.0193	
15 minute winter	Tank 2	17.001	18	-93.9	-1.920	-0.230	0.8504	
15 minute winter	18	Hydro-Brake®	19	11.8				
15 minute winter	19	1.011	20	11.7	0.773	0.359	0.8212	65.4
15 minute winter	CP9	14.000	14	2.7	1.240	0.070	0.0431	
15 minute winter	CP11	16.000	17	1.2	1.195	0.024	0.0120	

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Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 90.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	CP1	10	71.228	0.103	47.2	0.6848	0.0000	OK
15 minute winter	1	11	70.582	0.552	125.7	1.8737	0.0000	SURCHARGED
15 minute winter	2	11	70.467	0.712	173.7	1.9979	0.0000	SURCHARGED
15 minute winter	3	11	70.359	0.744	251.3	2.6946	0.0000	SURCHARGED
15 minute winter	4	11	70.765	0.250	47.1	0.7014	0.0000	SURCHARGED
15 minute winter	5	11	70.510	0.523	82.8	1.0811	0.0000	SURCHARGED
15 minute winter	CP2	10	70.868	0.088	21.6	0.3314	0.0000	OK
15 minute winter	CP3	11	70.945	0.075	20.8	0.7159	0.0000	OK
15 minute winter	6	11	70.231	0.813	412.0	1.9480	0.0000	SURCHARGED
15 minute winter	CP4	11	70.670	0.080	20.2	0.6255	0.0000	OK
15 minute winter	CP6	10	70.583	0.053	9.1	0.1288	0.0000	OK
15 minute summer	CP5	1	70.750	0.000	0.0	0.0000	0.0000	OK
15 minute winter	7	11	70.081	0.715	511.5	2.6117	0.0000	SURCHARGED
15 minute winter	9	11	70.494	0.494	63.3	1.5048	0.0000	SURCHARGED
15 minute winter	10	11	70.223	0.386	121.7	1.1151	0.0000	SURCHARGED
15 minute winter	11	11	70.040	0.440	165.4	1.1302	0.0000	OK
15 minute winter	12	11	69.991	0.441	209.4	1.1770	0.0000	OK
15 minute winter	CP7	10	70.524	0.064	12.4	0.1744	0.0000	OK
15 minute winter	8	11	69.806	0.506	785.6	1.6252	0.0000	OK
15 minute winter	CP8	11	70.517	0.067	14.1	0.4345	0.0000	OK
480 minute winter	13	464	69.767	0.508	67.1	2.0285	0.0000	OK
480 minute winter	Tank 1	464	69.767	0.417	35.6	316.8442	0.0000	OK
15 minute winter	15	11	70.768	0.233	46.8	0.6491	0.0000	SURCHARGED
15 minute winter	16	11	70.632	0.527	84.0	1.1715	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	CP1	1.000	1	47.0	2.525	0.432	0.5742	
15 minute winter	1	1.001	2	119.4	1.474	0.639	2.5234	
15 minute winter	2	1.002	3	173.7	1.096	0.737	4.1538	
15 minute winter	3	1.003	6	251.6	1.588	1.152	1.6217	
15 minute winter	4	2.000	5	45.4	1.165	1.139	0.9521	
15 minute winter	5	2.001	6	82.1	1.166	0.935	3.0170	
15 minute winter	CP2	3.000	6	21.2	1.788	0.649	0.3858	
15 minute winter	CP3	4.000	6	19.9	2.007	0.498	0.2639	
15 minute winter	6	1.004	7	412.5	1.465	1.357	7.4121	
15 minute winter	CP4	5.000	7	19.4	1.817	0.553	0.2710	
15 minute winter	CP6	6.000	7	9.0	1.454	0.266	0.2314	
15 minute summer	CP5	7.000	7	0.0	0.000	0.000	0.1761	
15 minute winter	7	1.005	8	512.3	1.834	1.684	8.9263	
15 minute winter	9	8.000	10	60.6	1.525	1.523	0.5928	
15 minute winter	10	8.001	11	121.0	1.719	1.103	0.6257	
15 minute winter	11	8.002	12	165.7	1.051	0.714	1.5220	
15 minute winter	12	8.003	8	210.2	1.417	1.144	4.4742	
15 minute winter	CP7	9.000	8	12.1	1.731	0.360	0.1400	
15 minute winter	8	1.006	13	325.4	1.375	1.067	4.8643	
15 minute winter	CP8	11.000	13	13.6	1.815	0.395	0.1497	
30 minute winter	13	1.007	14	250.9	1.057	0.821	7.0799	
15 minute winter	Tank 1	10.000	8	-461.6	-2.834	-1.348	3.8804	
15 minute winter	Tank 1	12.000	13	-286.7	-2.102	-0.644	4.2710	
15 minute winter	15	13.000	16	45.0	1.298	0.933	0.5988	
15 minute winter	16	13.001	14	79.9	2.010	1.182	1.2380	

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Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 90.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	14	464	69.767	0.567	74.5	1.1161	0.0000	OK
15 minute winter	CP10	11	70.872	0.122	42.0	1.4494	0.0000	OK
480 minute winter	17	464	69.767	0.586	82.4	1.9488	0.0000	OK
15 minute winter	CP12	11	70.739	0.039	6.9	0.2018	0.0000	OK
480 minute winter	Tank 2	464	69.767	0.617	68.9	677.1012	0.0000	SURCHARGED
480 minute winter	18	464	69.767	0.667	81.7	1.6966	0.0000	SURCHARGED
1440 minute winter	19	1260	69.156	0.103	13.6	0.2618	0.0000	OK
1440 minute winter	20	1260	68.933	0.096	13.6	0.0000	0.0000	OK
	OUTFALL							
15 minute winter	CP9	11	70.622	0.062	14.1	0.6680	0.0000	OK
15 minute winter	CP11	10	70.635	0.035	6.1	0.0843	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	14	1.008	17	276.8	1.247	1.018	2.6638	
15 minute winter	CP10	15.000	17	39.9	2.662	0.944	0.3000	
15 minute winter	17	1.009	18	321.6	1.520	0.661	3.4322	
15 minute winter	CP12	17.000	Tank 2	6.6	1.856	0.145	0.0597	
15 minute winter	Tank 2	17.001	18	-308.9	-2.993	-0.757	2.4999	
1440 minute winter	18	Hydro-Brake®	19	13.6				
1440 minute winter	19	1.011	20	13.6	0.804	0.415	0.9118	1080.9
15 minute winter	CP9	14.000	14	13.4	1.950	0.351	0.1372	
15 minute winter	CP11	16.000	17	6.0	1.919	0.118	0.0375	

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 90.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	CP1	12	71.465	0.340	67.6	3.1991	0.0000	FLOOD RISK
15 minute winter	1	11	71.245	1.215	162.1	4.1225	0.0000	SURCHARGED
15 minute winter	2	11	71.062	1.307	233.0	3.6659	0.0000	SURCHARGED
15 minute winter	3	11	70.875	1.260	342.1	4.5664	0.0000	FLOOD RISK
15 minute winter	4	11	71.553	1.038	67.6	2.9087	0.0000	FLOOD RISK
15 minute winter	5	11	71.145	1.158	110.9	2.3917	0.0000	SURCHARGED
15 minute winter	CP2	12	71.071	0.291	30.9	1.9006	0.0000	FLOOD RISK
15 minute winter	CP3	12	70.991	0.121	29.7	1.6803	0.0000	OK
15 minute winter	6	11	70.644	1.226	546.6	2.9385	0.0000	SURCHARGED
15 minute winter	CP4	12	70.717	0.127	28.9	1.4007	0.0000	OK
15 minute winter	CP6	10	70.594	0.064	13.1	0.1751	0.0000	OK
15 minute summer	CP5	1	70.750	0.000	0.0	0.0000	0.0000	OK
15 minute winter	7	11	70.383	1.017	684.4	3.7140	0.0000	SURCHARGED
15 minute winter	9	11	71.240	1.240	90.7	3.7746	0.0000	FLOOD RISK
15 minute winter	10	11	70.722	0.885	169.1	2.5598	0.0000	SURCHARGED
15 minute winter	11	11	70.360	0.760	232.0	1.9526	0.0000	SURCHARGED
15 minute winter	12	11	70.255	0.705	294.9	1.8827	0.0000	SURCHARGED
15 minute winter	CP7	10	70.537	0.077	17.7	0.2299	0.0000	OK
600 minute winter	8	570	70.159	0.859	99.8	2.7597	0.0000	SURCHARGED
15 minute winter	CP8	11	70.533	0.083	20.2	0.6324	0.0000	OK
600 minute winter	13	555	70.153	0.894	71.2	3.5718	0.0000	SURCHARGED
600 minute winter	Tank 1	585	70.150	0.800	47.6	608.1961	0.0000	SURCHARGED
15 minute winter	15	11	71.530	0.995	67.1	2.7783	0.0000	FLOOD RISK
15 minute winter	16	11	71.283	1.178	110.0	2.6171	0.0000	FLOOD RISK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	CP1	1.000	1	70.2	2.610	0.644	0.7954	
15 minute winter	1	1.001	2	154.3	1.472	0.825	2.5234	
15 minute winter	2	1.002	3	228.4	1.441	0.969	4.1538	
15 minute winter	3	1.003	6	339.2	2.141	1.553	1.6217	
15 minute winter	4	2.000	5	60.8	1.530	1.528	1.0307	
15 minute winter	5	2.001	6	109.4	1.554	1.245	3.0170	
15 minute winter	CP2	3.000	6	27.1	1.799	0.828	0.4793	
15 minute winter	CP3	4.000	6	26.4	2.018	0.659	0.3280	
15 minute winter	6	1.004	7	546.2	1.939	1.796	7.4121	
15 minute winter	CP4	5.000	7	25.2	1.826	0.716	0.3345	
15 minute winter	CP6	6.000	7	12.9	1.469	0.382	0.2482	
15 minute summer	CP5	7.000	7	0.0	0.000	0.000	0.1761	
15 minute winter	7	1.005	8	683.8	2.428	2.247	9.3965	
15 minute winter	9	8.000	10	83.5	2.099	2.096	0.5928	
15 minute winter	10	8.001	11	168.8	2.398	1.540	0.6287	
15 minute winter	11	8.002	12	232.1	1.465	1.000	1.5301	
15 minute winter	12	8.003	8	294.9	1.861	1.604	4.8539	
15 minute winter	CP7	9.000	8	17.4	1.739	0.518	0.2664	
15 minute winter	8	1.006	13	418.7	1.521	1.373	5.7736	
15 minute winter	CP8	11.000	13	19.4	1.981	0.565	0.2282	
30 minute winter	13	1.007	14	356.6	1.266	1.167	8.3300	
15 minute winter	Tank 1	10.000	8	-648.7	-3.093	-1.894	5.3980	
15 minute winter	Tank 1	12.000	13	-387.0	-2.330	-0.869	5.8767	
15 minute winter	15	13.000	16	58.3	1.466	1.208	0.5989	
15 minute winter	16	13.001	14	106.2	2.670	1.570	1.2380	

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 90.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	14	236	70.211	1.011	179.6	1.9906	0.0000	SURCHARGED
15 minute winter	CP10	12	70.996	0.246	60.2	4.6417	0.0000	FLOOD RISK
240 minute winter	17	236	70.159	0.978	200.0	3.2534	0.0000	SURCHARGED
15 minute winter	CP12	11	70.746	0.046	9.9	0.2831	0.0000	OK
360 minute winter	Tank 2	320	70.252	1.102	134.8	878.9490	0.0000	SURCHARGED
600 minute winter	18	555	70.166	1.066	84.0	2.7139	0.0000	SURCHARGED
60 minute summer	19	227	69.156	0.103	13.6	0.2618	0.0000	OK
60 minute summer	20	228	68.933	0.096	13.6	0.0000	0.0000	OK
	OUTFALL							
15 minute winter	CP9	11	70.635	0.075	20.2	0.9476	0.0000	OK
15 minute winter	CP11	10	70.643	0.043	8.8	0.1145	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	14	1.008	17	395.9	1.425	1.456	3.3041	
30 minute summer	CP10	15.000	17	43.9	2.646	1.038	0.3474	
30 minute winter	17	1.009	18	443.6	1.772	0.912	4.4191	
15 minute winter	CP12	17.000	Tank 2	9.5	2.057	0.207	0.0772	
30 minute winter	Tank 2	17.001	18	-430.0	-2.919	-1.054	3.9483	
30 minute winter	18	Hydro-Brake®	19	13.6				
60 minute summer	19	1.011	20	13.6	0.804	0.415	0.9118	236.0
15 minute winter	CP9	14.000	14	19.3	2.022	0.505	0.2493	
15 minute winter	CP11	16.000	17	8.9	2.069	0.174	0.0770	

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