Little Court, Haverhill
Surface Water Management note 02
For CARE (Little Court) Ltd
30th July

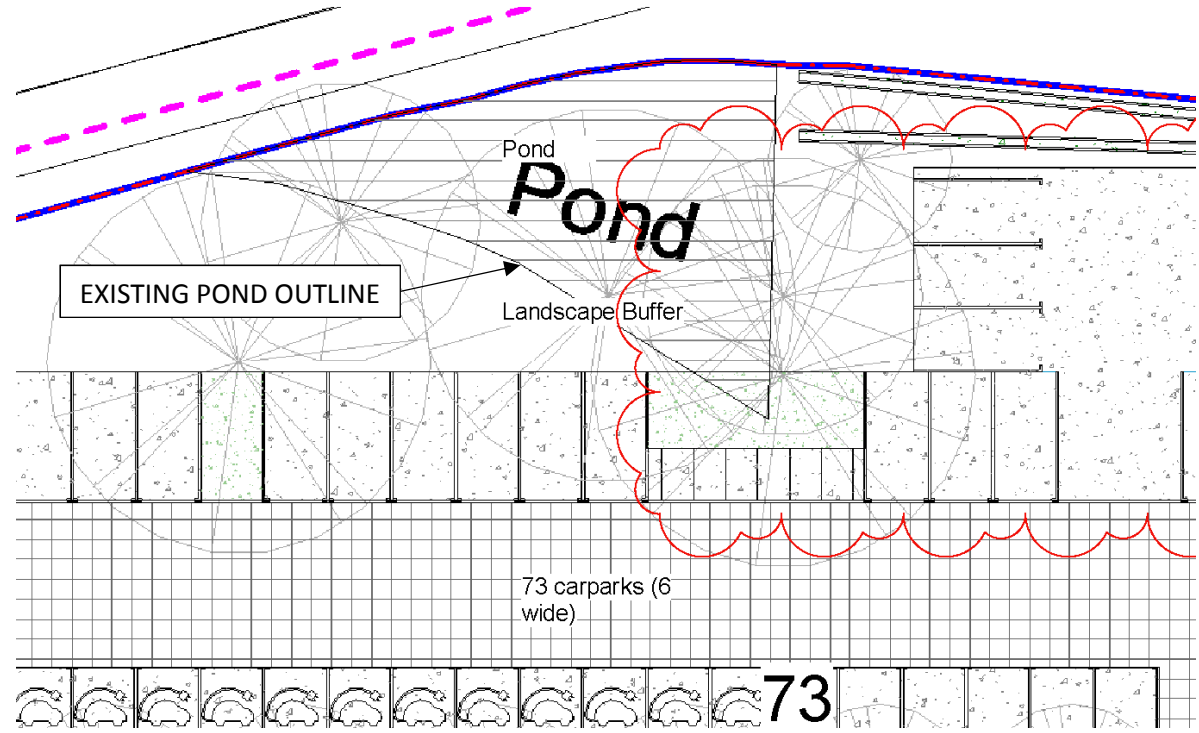
This note and accompanying drawing and calculations addresses the remaining queries raised by Suffolk County Council with regards to surface water management and the location of an existing pond (in the north of the site).

4. The proposed attenuation basin has been amended (and remodelled in the attached Causeway Flow calculations) to meet the preference expressed by SCC for 1 in 4 side slopes, with a 1.5 m wide bench 0.6 m from the invert of the basin. The peak depth of water in the basin reaches a little over 900 mm. Given the low impact of any overtopping from the basin (and its limited size) we consider it to have sufficient freeboard. However, additional freeboard can be created with the installation of a low (in the order of 150 mm to 200 mm) landscaping bund and/or wooden sleeper type structure around the basin (set back from the banks).

5. The appended calculations show that approximately 50 % of the total storage volume in the system is available during the critical 1 in 30 storm. The total storage volume during the critical event equates to 408 m^3 out of a total available volume of approximately 800 m^3. For information, assuming a conservative discharge rate of 2.0 l/s (less than the peak discharge rate of 2.8 l/s during the 1 in 30 storm), a little over 170 m^3 would be lost from the basin (2 x 3600 x 24 / 1000).

8. The invert level of the receiving ditch at the point of outfall from the basin is approximately 102.25 m AOD (circa 200 mm lower than the invert of the flow control). This has been calculated using the nearby invert level for the ditch and working back up slope based on the gradient of the ditch (approximately 1 in 47). The length of the pipe from the basin to the ditch is circa 70 m, so assuming that the ditch is not re-profiled (which is within the gift of the landowner), the gradient of the outgoing pipework would be circa 1 in 330 (although the gradient is largely irrelevant in a head driven system).

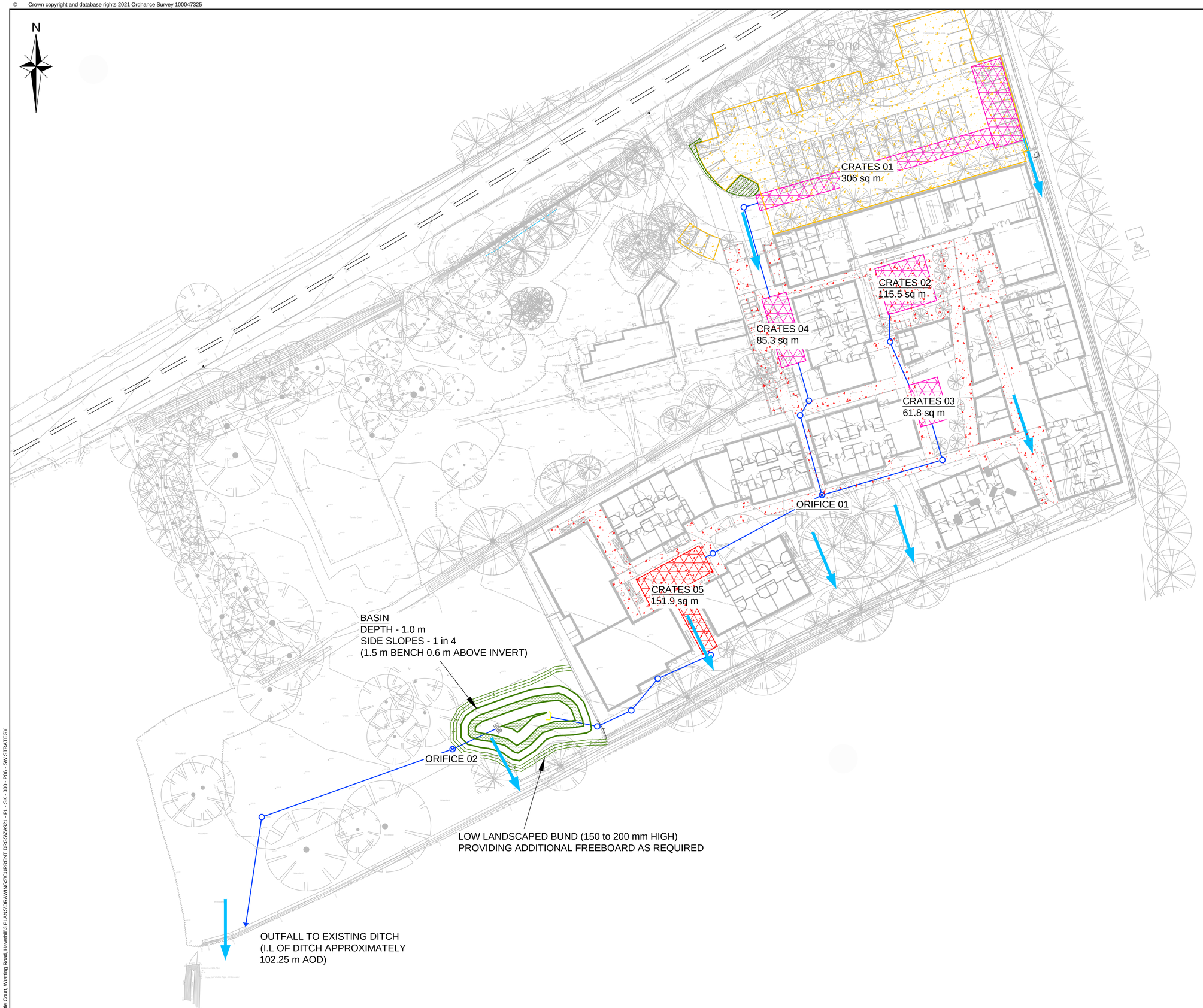
9. The proposed development does not extend into the current pond (see image overleaf showing the approximate triangular outline of the pond. Given that the pond sits at the crest of the road, with no known formal connections into it (confirmed by the client), it will tend to perform a local drainage function responding to direct rainfall rather than any flow from further afield. Access to maintain the pond should actually be improved (as it will be accessible from the adjacent hardstanding). In the unlikely event that the pond fills up to the point of overtopping then flows (if they are actually noticeable) would follow the routes identified on the previous plan (flowing along the western and eastern edges of the proposed building in the north, and through the site).



Appended information

Drawing ZA921 SK/PL/300/P06

Causeway Flow calculations



KEY

- 3 x 0.40m HIGH AQUACELL CELLULAR STORAGE CRATES
- 2 x 0.15m HIGH PERMAVOID CELLULAR STORAGE CRATES
- PERMEABLE MACADAM
- PERMEABLE RESIN BOUND AGGREGATE FINISH
- GRASSED FILTER DRAIN
- SPINE NETWORK
- ORIFICE CONTROL CHAMBER
- DEBRIS FILTER
- HEADWALL
- OVERLAND FLOW ROUTE

NOTES

REV	DESCRIPTION	DE	DR	CH	DATE
P06	ATTENUATION BASIN REVISED, BUND ADDED, IMAGES REMOVED	-	DP	-	07/2021
P05	LAYOUT UPDATED, SW SYSTEM NOTES AND OVERLAND FLOW ADDED		JH	-	07/2021
P04	CLIENT NAME UPDATED	-	DP	-	02/2021
P03	OUTFALL RELOCATED	-	DP	-	02/2021
P02	SW STRATEGY REVISED	-	DP	-	02/2021
P01	SW STRATEGY REVISED	-	DP	-	01/2021

DESIGNED BY	DRAWN BY	CHECKED BY
-	DP	-

SCALE @ A1 SIZE	DATE
D.N.S.	13/01/2021

PROJECT TITLE
LITTLE COURT, WRATTING ROAD, HAVERHILL

DRAWING TITLE
OUTLINE SURFACE WATER MANAGEMENT STRATEGY

CLIENT
CARE (LITTLE COURT) LTD

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DRAWING NUMBER	REV.
ZA921 - PL - SK - 300	P06

M:\ZA921 Little Court, Wratting Road, Haverhill\3 PLANS\DRAWINGS\CURRENT DRGS\ZA921 - PL - SK - 300 - P06 - SW STRATEGY

Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.950	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	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
BASIN	0.068	5.00	103.500	1350	1.000
CRATES 1	0.275	5.00	105.450	1350	1.910
CRATES 2	0.104	5.00	105.400	1200	1.860
CRATES 3	0.203	5.00	105.250	1200	1.750
CRATES 4	0.077	5.00	105.000	1350	1.500
CRATES 5	0.149	5.00	104.100	1350	1.200
ORIFICE 1			104.750	1350	1.350
ORIFICE 2			103.500	1350	1.015

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	CRATES 1	CRATES 4	25.000	0.600	103.540	103.500	0.040	625.0	375	5.58	50.0
2.000	CRATES 2	CRATES 3	16.000	0.600	103.540	103.500	0.040	400.0	225	5.41	50.0
2.001	CRATES 3	ORIFICE 1	35.000	0.600	103.500	103.400	0.100	350.0	300	6.11	50.0
1.001	CRATES 4	ORIFICE 1	30.000	0.600	103.500	103.400	0.100	300.0	375	6.06	50.0
1.002	ORIFICE 1	CRATES 5	28.000	0.600	103.400	102.900	0.500	56.0	375	6.30	50.0
1.003	CRATES 5	BASIN	34.000	0.600	102.900	102.500	0.400	85.0	375	6.59	50.0
1.004	BASIN	ORIFICE 2	6.000	0.600	102.500	102.485	0.015	400.0	450	6.69	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	0.717	79.2	47.2	1.535	1.125	0.275	0.0	208	0.747
2.000	0.648	25.7	17.9	1.635	1.525	0.104	0.0	138	0.699
2.001	0.834	59.0	52.7	1.450	1.050	0.307	0.0	222	0.939
1.001	1.041	114.9	60.4	1.125	0.975	0.352	0.0	193	1.053
1.002	2.425	267.8	113.1	0.975	0.825	0.659	0.0	170	2.325
1.003	1.966	217.1	138.7	0.825	0.625	0.808	0.0	218	2.079
1.004	1.010	160.7	150.4	0.550	0.565	0.876	0.0	348	1.141

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	25.000	625.0	375	CIRCULAR	105.450	103.540	1.535	105.000	103.500	1.125
2.000	16.000	400.0	225	CIRCULAR	105.400	103.540	1.635	105.250	103.500	1.525
2.001	35.000	350.0	300	CIRCULAR	105.250	103.500	1.450	104.750	103.400	1.050
1.001	30.000	300.0	375	CIRCULAR	105.000	103.500	1.125	104.750	103.400	0.975
1.002	28.000	56.0	375	CIRCULAR	104.750	103.400	0.975	104.100	102.900	0.825
1.003	34.000	85.0	375	CIRCULAR	104.100	102.900	0.825	103.500	102.500	0.625
1.004	6.000	400.0	450	CIRCULAR	103.500	102.500	0.550	103.500	102.485	0.565

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	CRATES 1	1350	Manhole	Adoptable	CRATES 4	1350	Manhole	Adoptable
2.000	CRATES 2	1200	Manhole	Adoptable	CRATES 3	1200	Manhole	Adoptable
2.001	CRATES 3	1200	Manhole	Adoptable	ORIFICE 1	1350	Manhole	Adoptable
1.001	CRATES 4	1350	Manhole	Adoptable	ORIFICE 1	1350	Manhole	Adoptable
1.002	ORIFICE 1	1350	Manhole	Adoptable	CRATES 5	1350	Manhole	Adoptable
1.003	CRATES 5	1350	Manhole	Adoptable	BASIN	1350	Manhole	Adoptable
1.004	BASIN	1350	Manhole	Adoptable	ORIFICE 2	1350	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
BASIN	103.500	1.000	1350	1	1.003	102.500	375
				0	1.004	102.500	450
CRATES 1	105.450	1.910	1350	0	1.000	103.540	375
CRATES 2	105.400	1.860	1200	0	2.000	103.540	225
CRATES 3	105.250	1.750	1200	1	2.000	103.500	225
				0	2.001	103.500	300
CRATES 4	105.000	1.500	1350	1	1.000	103.500	375
				0	1.001	103.500	375
CRATES 5	104.100	1.200	1350	1	1.002	102.900	375
				0	1.003	102.900	375
ORIFICE 1	104.750	1.350	1350	1	2.001	103.400	300
				2	1.001	103.400	375
				0	1.002	103.400	375

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
ORIFICE 2	103.500	1.015	1350	1	1.004	102.485	450

Simulation Settings

Rainfall Methodology	FEH-13	Skip Steady State	x	1 year (l/s)	
Summer CV	0.950	Drain Down Time (mins)	240	30 year (l/s)	
Winter CV	0.950	Additional Storage (m³/ha)	20.0	100 year (l/s)	
Analysis Speed	Normal	Check Discharge Rate(s)	✓	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	0	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 years	
Greenfield Method	IH124	Growth Factor 100 years	
Positively Drained Area (ha)	1.000	Betterment (%)	0
SAAR (mm)	587	QBar	2.3
Soil Index	1	Q 1 year (l/s)	
SPR	0.37	Q 30 year (l/s)	
Region	6	Q 100 year (l/s)	
Growth Factor 1 year			

Node ORIFICE 1 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.200	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.5		
Invert Level (m)	103.400	Diameter (m)	0.025		

Node ORIFICE 2 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.000	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	3.4		
Invert Level (m)	102.485	Diameter (m)	0.041		

Node BASIN Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	102.500
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	9.9	0.0	0.600	105.2	0.0	0.601	188.9	0.0	1.000	294.0	0.0

Node CRATES 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	103.540
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	306.0	0.0	1.200	306.0	0.0	1.201	0.0	0.0

Node CRATES 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	103.540
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	115.5	0.0	1.200	115.5	0.0	1.201	0.0	0.0

Node CRATES 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	103.500
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	61.8	0.0	1.200	61.8	0.0	1.201	0.0	0.0

Node CRATES 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	103.500
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	85.3	0.0	1.200	85.3	0.0	1.201	0.0	0.0

Node CRATES 5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	102.900
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	151.9	0.0	0.300	151.9	0.0	0.301	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	102.757	29.077
2 year 15 minute winter	72.110	29.077
2 year 30 minute summer	65.514	18.538
2 year 30 minute winter	45.975	18.538
2 year 60 minute summer	43.278	11.437
2 year 60 minute winter	28.753	11.437
2 year 120 minute summer	31.786	8.400
2 year 120 minute winter	21.118	8.400
2 year 180 minute summer	25.890	6.662
2 year 180 minute winter	16.829	6.662
2 year 240 minute summer	20.972	5.542
2 year 240 minute winter	13.933	5.542
2 year 360 minute summer	16.182	4.164
2 year 360 minute winter	10.518	4.164
2 year 480 minute summer	12.676	3.350
2 year 480 minute winter	8.421	3.350
2 year 600 minute summer	10.285	2.813
2 year 600 minute winter	7.027	2.813
2 year 720 minute summer	9.074	2.432
2 year 720 minute winter	6.099	2.432
2 year 960 minute summer	7.306	1.924
2 year 960 minute winter	4.840	1.924
2 year 1440 minute summer	5.164	1.384
2 year 1440 minute winter	3.471	1.384
2 year 2160 minute summer	3.622	1.001
2 year 2160 minute winter	2.495	1.001
2 year 2880 minute summer	2.990	0.801
2 year 2880 minute winter	2.009	0.801
2 year 4320 minute summer	2.290	0.599
2 year 4320 minute winter	1.508	0.599
2 year 5760 minute summer	1.932	0.495
2 year 5760 minute winter	1.251	0.495
2 year 7200 minute summer	1.691	0.431
2 year 7200 minute winter	1.092	0.431
2 year 8640 minute summer	1.525	0.389
2 year 8640 minute winter	0.984	0.389
2 year 10080 minute summer	1.406	0.359
2 year 10080 minute winter	0.907	0.359
30 year 15 minute summer	270.133	76.438
30 year 15 minute winter	189.567	76.438
30 year 30 minute summer	175.114	49.551
30 year 30 minute winter	122.887	49.551
30 year 60 minute summer	115.737	30.586
30 year 60 minute winter	76.893	30.586
30 year 120 minute summer	74.061	19.572
30 year 120 minute winter	49.204	19.572
30 year 180 minute summer	57.106	14.695
30 year 180 minute winter	37.121	14.695
30 year 240 minute summer	44.887	11.862
30 year 240 minute winter	29.822	11.862
30 year 360 minute summer	33.564	8.637
30 year 360 minute winter	21.817	8.637

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 480 minute summer	25.843	6.829
30 year 480 minute winter	17.169	6.829
30 year 600 minute summer	20.741	5.673
30 year 600 minute winter	14.171	5.673
30 year 720 minute summer	18.160	4.867
30 year 720 minute winter	12.205	4.867
30 year 960 minute summer	14.488	3.815
30 year 960 minute winter	9.597	3.815
30 year 1440 minute summer	10.101	2.707
30 year 1440 minute winter	6.789	2.707
30 year 2160 minute summer	7.008	1.937
30 year 2160 minute winter	4.828	1.937
30 year 2880 minute summer	5.746	1.540
30 year 2880 minute winter	3.862	1.540
30 year 4320 minute summer	4.352	1.138
30 year 4320 minute winter	2.866	1.138
30 year 5760 minute summer	3.644	0.933
30 year 5760 minute winter	2.359	0.933
30 year 7200 minute summer	3.172	0.809
30 year 7200 minute winter	2.048	0.809
30 year 8640 minute summer	2.848	0.727
30 year 8640 minute winter	1.838	0.727
30 year 10080 minute summer	2.617	0.668
30 year 10080 minute winter	1.689	0.668
100 year +40% CC 15 minute summer	486.461	137.652
100 year +40% CC 15 minute winter	341.376	137.652
100 year +40% CC 30 minute summer	317.599	89.870
100 year +40% CC 30 minute winter	222.877	89.870
100 year +40% CC 60 minute summer	210.932	55.743
100 year +40% CC 60 minute winter	140.138	55.743
100 year +40% CC 120 minute summer	133.502	35.281
100 year +40% CC 120 minute winter	88.695	35.281
100 year +40% CC 180 minute summer	102.896	26.479
100 year +40% CC 180 minute winter	66.885	26.479
100 year +40% CC 240 minute summer	80.964	21.397
100 year +40% CC 240 minute winter	53.791	21.397
100 year +40% CC 360 minute summer	60.676	15.614
100 year +40% CC 360 minute winter	39.441	15.614
100 year +40% CC 480 minute summer	46.769	12.360
100 year +40% CC 480 minute winter	31.072	12.360
100 year +40% CC 600 minute summer	37.531	10.266
100 year +40% CC 600 minute winter	25.644	10.266
100 year +40% CC 720 minute summer	32.836	8.800
100 year +40% CC 720 minute winter	22.068	8.800
100 year +40% CC 960 minute summer	26.116	6.877
100 year +40% CC 960 minute winter	17.299	6.877
100 year +40% CC 1440 minute summer	18.071	4.843
100 year +40% CC 1440 minute winter	12.145	4.843
100 year +40% CC 2160 minute summer	12.387	3.423
100 year +40% CC 2160 minute winter	8.535	3.423
100 year +40% CC 2880 minute summer	10.051	2.694
100 year +40% CC 2880 minute winter	6.755	2.694

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 4320 minute summer	7.486	1.957
100 year +40% CC 4320 minute winter	4.930	1.957
100 year +40% CC 5760 minute summer	6.188	1.584
100 year +40% CC 5760 minute winter	4.005	1.584
100 year +40% CC 7200 minute summer	5.335	1.361
100 year +40% CC 7200 minute winter	3.443	1.361
100 year +40% CC 8640 minute summer	4.755	1.213
100 year +40% CC 8640 minute winter	3.069	1.213
100 year +40% CC 10080 minute summer	4.344	1.108
100 year +40% CC 10080 minute winter	2.804	1.108

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	BASIN	264	102.951	0.451	8.8	21.8766	0.0000	SURCHARGED
960 minute winter	CRATES 1	945	103.800	0.260	4.0	76.8179	0.0000	OK
960 minute winter	CRATES 2	945	103.800	0.260	1.5	29.1561	0.0000	SURCHARGED
960 minute winter	CRATES 3	945	103.800	0.300	2.6	18.6721	0.0000	SURCHARGED
960 minute winter	CRATES 4	945	103.800	0.300	1.7	25.0803	0.0000	OK
120 minute summer	CRATES 5	68	102.954	0.054	12.5	8.0090	0.0000	OK
960 minute winter	ORIFICE 1	945	103.800	0.400	1.5	0.5729	0.0000	SURCHARGED
360 minute summer	ORIFICE 2	264	102.951	0.466	3.1	0.6672	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 summer	BASIN	1.004	ORIFICE 2	3.1	0.131	0.019	0.9504	
960 minute winter	CRATES 1	1.000	CRATES 4	0.6	0.133	0.008	2.2039	
960 minute winter	CRATES 2	2.000	CRATES 3	0.3	0.095	0.011	0.6363	
960 minute winter	CRATES 3	2.001	ORIFICE 1	1.5	0.139	0.025	2.4639	
960 minute winter	CRATES 4	1.001	ORIFICE 1	-0.7	0.019	-0.006	3.0741	
120 minute summer	CRATES 5	1.003	BASIN	9.9	0.233	0.046	1.9989	
960 minute winter	ORIFICE 1	Orifice	CRATES 5	0.8				
360 minute summer	ORIFICE 2	Orifice		2.3				63.0

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	BASIN	344	103.125	0.625	10.5	41.0333	0.0000	SURCHARGED
10080 minute summer	CRATES 1	6540	104.131	0.591	1.9	174.2130	0.0000	SURCHARGED
10080 minute summer	CRATES 2	6540	104.131	0.591	0.7	66.1251	0.0000	SURCHARGED
10080 minute summer	CRATES 3	6540	104.131	0.631	1.4	39.1948	0.0000	SURCHARGED
10080 minute summer	CRATES 4	6540	104.131	0.631	0.6	52.6447	0.0000	SURCHARGED
360 minute winter	CRATES 5	344	103.125	0.225	10.4	33.3507	0.0000	OK
10080 minute summer	ORIFICE 1	6540	104.131	0.731	1.1	1.0454	0.0000	SURCHARGED
240 minute winter	ORIFICE 2	240	103.125	0.639	3.5	0.9151	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	BASIN	1.004	ORIFICE 2	4.1	0.136	0.026	0.9507	
10080 minute summer	CRATES 1	1.000	CRATES 4	0.5	0.162	0.007	2.7574	
10080 minute summer	CRATES 2	2.000	CRATES 3	0.2	0.131	0.009	0.6363	
10080 minute summer	CRATES 3	2.001	ORIFICE 1	1.0	0.109	0.017	2.4647	
10080 minute summer	CRATES 4	1.001	ORIFICE 1	0.7	0.024	0.006	3.3089	
360 minute winter	CRATES 5	1.003	BASIN	7.2	0.193	0.033	3.0484	
10080 minute summer	ORIFICE 1	Orifice	CRATES 5	1.1				
240 minute winter	ORIFICE 2	Orifice		2.8				66.3

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	BASIN	464	103.416	0.916	15.8	109.6806	0.0000	FLOOD RISK
10080 minute summer	CRATES 1	6840	104.698	1.158	3.4	341.5226	0.0000	SURCHARGED
10080 minute summer	CRATES 2	6840	104.698	1.158	1.3	129.6291	0.0000	SURCHARGED
10080 minute summer	CRATES 3	6840	104.698	1.198	2.3	74.4483	0.0000	SURCHARGED
10080 minute summer	CRATES 4	6840	104.698	1.198	1.3	99.9960	0.0000	SURCHARGED
480 minute winter	CRATES 5	464	103.416	0.516	13.3	45.3823	0.0000	SURCHARGED
10080 minute summer	ORIFICE 1	6840	104.698	1.298	1.5	1.8569	0.0000	FLOOD RISK
480 minute winter	ORIFICE 2	464	103.416	0.931	3.7	1.3320	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	BASIN	1.004	ORIFICE 2	3.7	0.180	0.023	0.9507	
10080 minute summer	CRATES 1	1.000	CRATES 4	0.7	0.143	0.009	2.7574	
10080 minute summer	CRATES 2	2.000	CRATES 3	0.3	0.102	0.011	0.6363	
10080 minute summer	CRATES 3	2.001	ORIFICE 1	1.5	0.095	0.026	2.4647	
10080 minute summer	CRATES 4	1.001	ORIFICE 1	0.9	0.025	0.008	3.3089	
480 minute winter	CRATES 5	1.003	BASIN	11.2	0.191	0.051	3.7501	
10080 minute summer	ORIFICE 1	Orifice	CRATES 5	1.5				
480 minute winter	ORIFICE 2	Orifice		3.3				116.8