APPENDIX B – DESIGN CERTIFICATE

THE UNIVERSITY OF SYDNEY

BONACCI

Campus Infrastructure & Services

CIS STANDARD – PROJECT DESIGN CERTIFICATION FORM (CIS-PROJ-F001)

Project Name	Engineering & Technology Precinct (ETP) - Stage 1		
Project Code	USYDCON/2016/184	**Sub Project No**	N/A
Project Manager	CIS – Drew Bagnall	**Phone Contact**	02 8627 5269
Project Description	Partial demolition of the existing J03 building and new construction to redevelop the J03 building into a Micro Engineering Research and Teaching Facility		
Project Locations – Building Code/ Level / Room Number	J03 Electrical Engineering Building		
Consultant Contact Name	John Williams	**Consultant Position**	Director
Consultant Contact Qualifications	BE (Hons), CP Eng, NPER, Member of Engineers Australia		
Consultant Company Name	Bonacci Group (NSW) Pty Ltd		
Consultant Company Address	L6, 37 York St, Sydney, NSW 2000		
Consultant Phone Contact	(02) 8247 8400	**Consultant Email**	jwilliams@bonaccigroup.com
Discipline Service	☐ Architectural ☐ Mechanical ☐ Fire ☐ Other. Please specify:	☒ Civil ☐ Electrical ☐ Hydraulic ☐	
Project Phase	☐ Design & Development ☐ Construction	☒ 70% Detailed Design ☐ Tender	

CERTIFICATION *Initialed*

We certify that the current design documentation prepared by us:

☐ Complies with relevant codes and legislation, including: _____
- ☐ Building Code of Australia _____
- ☐ Disability Discrimination Act _____
- ☐ Work Health & Safety Regulations _____

☐ Complies with the University of Sydney Design Standards _____
- ☐ If not, we have completed and attach the *Request for Dispensation from CIS Standards* form n/a

☐ Is a design solution suitable for the University's requirements as described in the Design Brief _____

☐ Is fully coordinated with the work of other Consultants on the Consultant Team; and n/a

☐ Is designed and coordinated and suitable for design and construct tendering (where applicable) _____

☐ Is fully designed and coordinated and suitable for construct only tendering (where applicable) _____

Campus Infrastructure & Services

CIS STANDARD – PROJECT DESIGN CERTIFICATION FORM (CIS-PROJ-F001)

Bonacci Group (NSW) Pty Ltd has been engaged by Laing O'Rourke Australia Construction Pty Ltd for the civil design, documentation and certification for the above mentioned project. We confirm that the following Civil Documents and related details, as outlined on the attached drawing register, have been produced and designed by Bonacci in relation to the Project.

Design Statement

The civil elements of the new build have been designed by Bonacci Group in accordance with the following;

New Build Structures

Building Code of Australia.

Limited to Australian Standards:

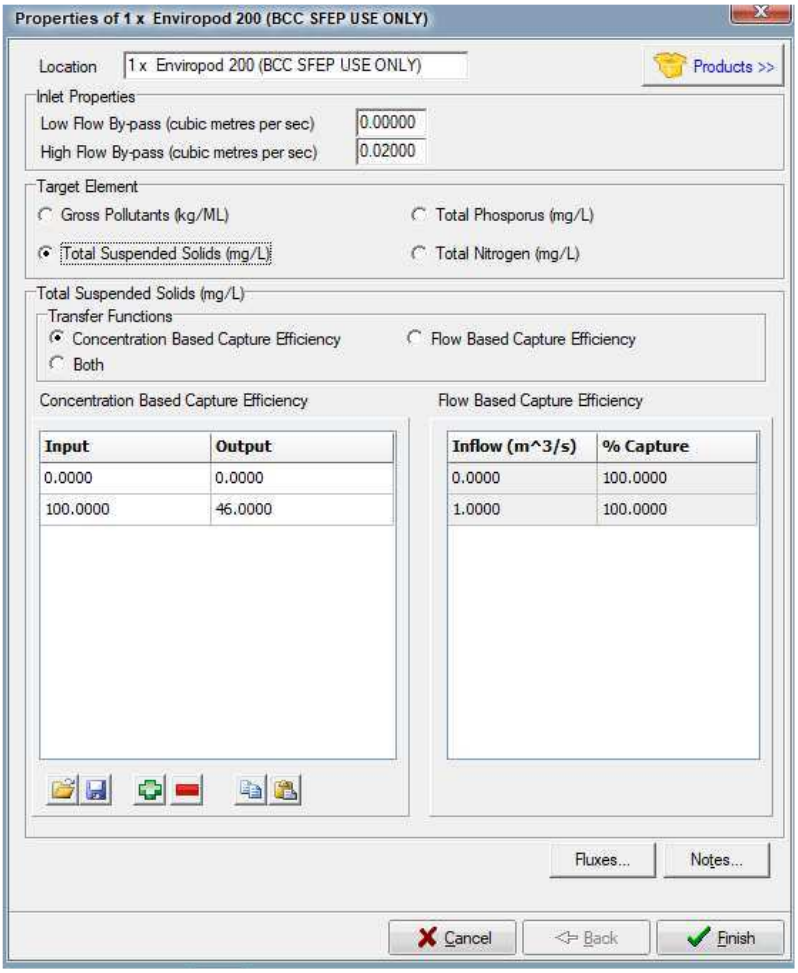
AS3500.3	- Plumbing and Drainage – Stormwater Drainage
AR&R 2016	- Australian Rainfall and Runoff
DCP 2012	- City of Sydney Council – Development Control Plans

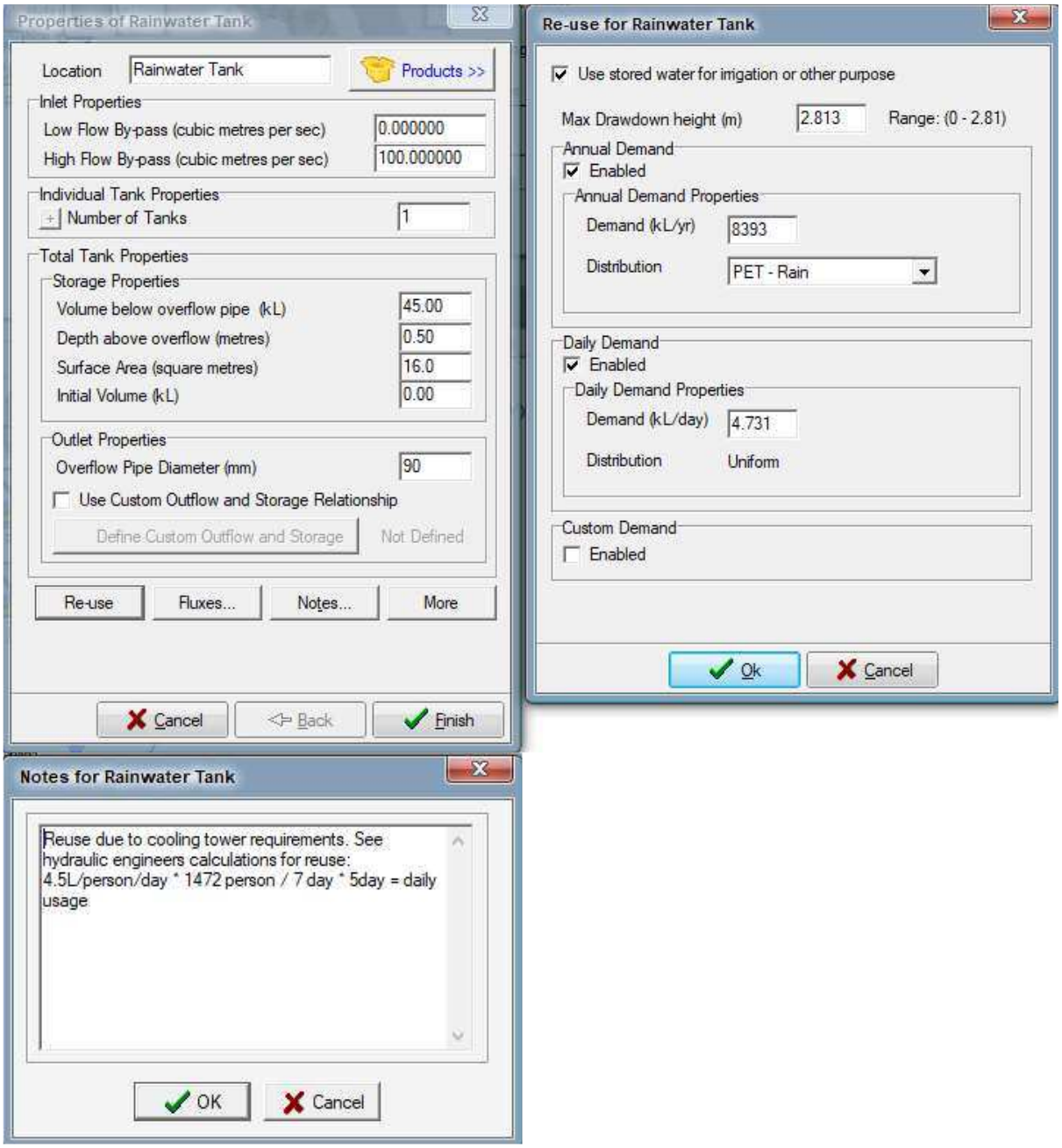
The impact of the proposed works on the floodwater levels downstream of the development site are within City of Sydney Council guidelines.

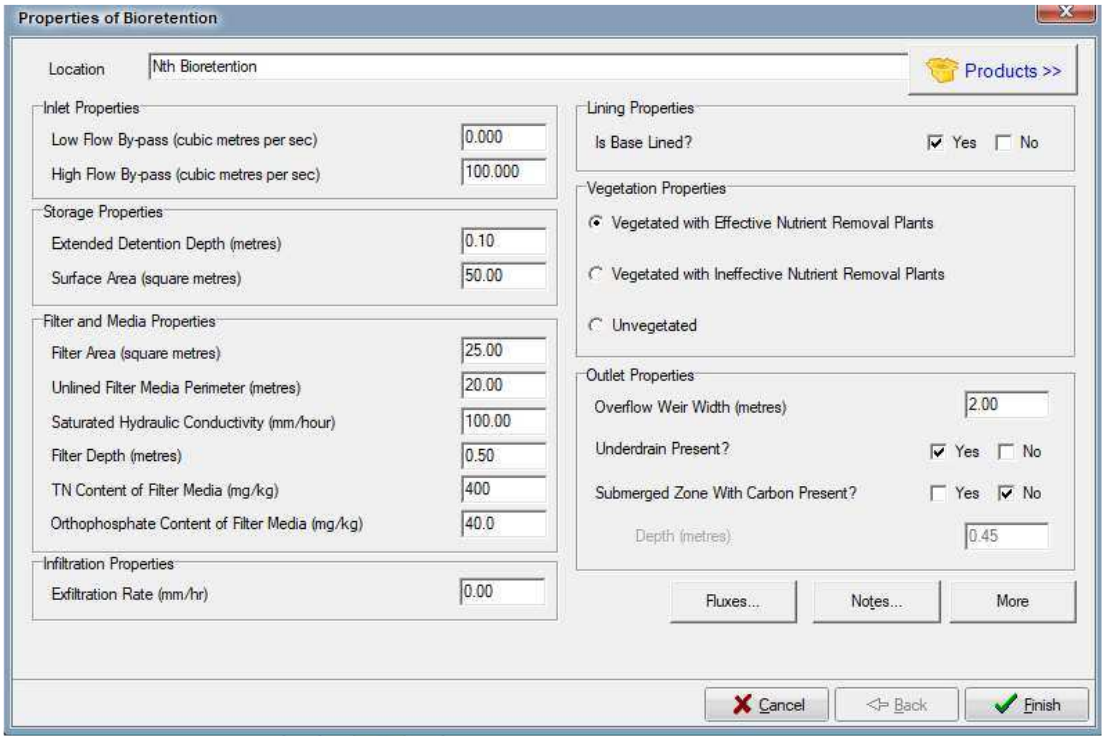
The impact of the proposed works on the Sydney Water and Council stormwater infrastructure downstream of the development site are within Sydney Water and City of Sydney Council guidelines.

Consultant - Bonacci Group Pty Ltd **Position -** Director **Date** 03/07/2018

APPENDIX C – MUSIC PARAMETERS




Properties of Rainwater Tank
Location
Rainwater Tank
Products >>
Inlet Properties
Low Flow By-pass (cubic metres per sec)
0.000000
High Flow By-pass (cubic metres per sec)
100.000000
Individual Tank Properties
Number of Tanks
1
Total Tank Properties
Storage Properties
Volume below overflow pipe (kL)
45.00
Depth above overflow (metres)
0.50
Surface Area (square metres)
16.0
Initial Volume (kL)
0.00
Outlet Properties
Overflow Pipe Diameter (mm)
90
Use Custom Outflow and Storage Relationship
Define Custom Outflow and Storage
Not Defined
Re-use
Fluxes...
Notes...
More
Cancel
Back
Finish
Re-use for Rainwater Tank
Use stored water for irrigation or other purpose
Max Drawdown height (m)
2.813
Range: (0 - 2.81)
Annual Demand
Enabled
Annual Demand Properties
Demand (kL/yr)
8393
Distribution
PET - Rain
Daily Demand
Enabled
Daily Demand Properties
Demand (kL/day)
4.731
Distribution
Uniform
Custom Demand
Enabled
Ok
Cancel
Notes for Rainwater Tank
Reuse due to cooling tower requirements. See hydraulic engineers calculations for reuse:
4.5L/person/day * 1472 person / 7 day * 5day = daily usage
OK
Cancel


Properties of Bioretention
Location
Nth Bioretention
Products >>
Inlet Properties
Low Flow By-pass (cubic metres per sec)
0.000
High Flow By-pass (cubic metres per sec)
100.000
Storage Properties
Extended Detention Depth (metres)
0.10
Surface Area (square metres)
50.00
Filter and Media Properties
Filter Area (square metres)
25.00
Unlined Filter Media Perimeter (metres)
20.00
Saturated Hydraulic Conductivity (mm/hour)
100.00
Filter Depth (metres)
0.50
TN Content of Filter Media (mg/kg)
400
Orthophosphate Content of Filter Media (mg/kg)
40.0
Infiltration Properties
Exfiltration Rate (mm/hr)
0.00
Lining Properties
Is Base Lined?
Yes
No
Vegetation Properties
Vegetated with Effective Nutrient Removal Plants
Vegetated with Ineffective Nutrient Removal Plants
Unvegetated
Outlet Properties
Overflow Weir Width (metres)
2.00
Underdrain Present?
Yes
No
Submerged Zone With Carbon Present?
Yes
No
Depth (metres)
0.45
Fluxes...
Notes...
More
Cancel
Back
Finish

APPENDIX D – DRAINS RESULTS

1% AEP Design:

DRAINS results prepared from Version 2018.06

PIT / NODE DETAILS

Name	Max HGL	Max Pond	Version 8 Max Surface	Max
Pond	Min	Overflow	Constraint	
		HGL	Flow	Arriving
	Volume	Freeboard	(cu.m/s)	
			(cu.m/s)	
	(cu.m)	(m)		
GD	19.53		0.033	
		0.87	0.000	Inlet Capacity
B1	19.43		0.000	
		0.87		None
B2	15.93		0.000	
		4.17		None
B3	15.63		0.000	
		4.07		None
B4	15.44		0.000	
		0.91		None
B5	15.36		0.000	
		0.99		None
B6	15.30		0.000	
		1.20		None
B7	15.20	16.54	0.012	
	0.3	1.30	0.000	Inlet Capacity
N16617	15.11		0.000	
Pit13910	19.10	19.69	0.031	
	5.6	0.55	0.000	Inlet Capacity
N19394	16.08		0.019	
roof	21.96		0.118	
C1	21.14		0.000	
		0.71	0.000	None
c2	19.84		0.000	
		0.71		None
N21684	16.66		0.000	

SUB-CATCHMENT DETAILS

Name	Max	Paved	Grassed	
	Paved	Grassed	Supp.	Due to Storm
	Flow Q	Max Q	Max	Q
	Tc	Tc	Tc	
	(cu.m/s)	(cu.m/s)	(cu.m/s)	
	(min)	(min)	(min)	
GD	0.026	0.013	0.014	
	5.00	5.00	5.00	1% AEP, 10 min burst, Storm 1
Cat5635	0.011	0.011	0.000	
	5.00	5.00	5.00	1% AEP, 5 min burst, Storm 1
Cat4892	0.059	0.033	0.027	
	5.00	5.00	5.00	1% AEP, 10 min burst, Storm 1
Cat5382	0.025	0.016	0.009	
	5.00	5.00	5.00	1% AEP, 5 min burst, Storm 1
TRAPPED LOW PT		0.009	0.009	
	0.000	5.00	5.00	
	5.00	1% AEP, 5 min burst, Storm 1		
ROOF	0.018	0.018	0.000	
	5.00	5.00	5.00	1% AEP, 5 min burst, Storm 1
ROOF	0.107	0.107	0.000	
	5.00	5.00	5.00	1% AEP, 5 min burst, Storm 1
TO BASIN		0.109	0.074	
	0.034	5.00	5.00	
	5.00	1% AEP, 5 min burst, Storm 1		

PIPE DETAILS

Name	Max Q	Max V	Max	U/S
	Max D/S	Due to Storm		
	(cu.m/s)	(m/s)	HGL (m)	HGL (m)

P Roof	0.026	1.12	19.530
	19.433	1% AEP, 10 min burst, Storm 1	
P13942	0.026	1.15	19.433
	19.280	1% AEP, 10 min burst, Storm 1	
Pipe13954		0.077	1.02
	15.929	15.629	1% AEP, 10 min burst, Storm 4
P13956	0.073	0.90	15.629
	15.438	1% AEP, 10 min burst, Storm 7	
P13960	0.085	0.82	15.438
	15.364	1% AEP, 10 min burst, Storm 7	
P13963	0.086	0.83	15.363
	15.295	1% AEP, 10 min burst, Storm 7	
P13966	0.099	0.94	15.294
	15.196	1% AEP, 10 min burst, Storm 7	
Pipe14015		0.106	1.28
	15.191	15.106	1% AEP, 10 min burst, Storm 7
Pipe14021		0.053	1.42
	19.328	19.208	1% AEP, 10 min burst, Storm 7
P16215	0.017	0.88	19.096
	15.438	1% AEP, 10 min burst, Storm 4	
Pipe16306		0.018	2.23
	16.083	15.295	1% AEP, 5 min burst, Storm 1
Pipe18094		0.107	3.81
	21.965	21.137	1% AEP, 5 min burst, Storm 1
Pipe18095		0.114	1.78
	21.106	19.837	1% AEP, 5 min burst, Storm 1
Pipe18096		0.107	3.75
	19.781	18.127	1% AEP, 5 min burst, Storm 1
P18119	0.086	1.53	17.433
	16.659	1% AEP, 15 min burst, Storm 8	

CHANNEL DETAILS

Name	Max Q	Max V Due to Storm
	(cu.m/s)	(m/s)

OVERFLOW ROUTE DETAILS

Name	Max Q	U/S Safe Q	Max Max D	Q Max DxV	D/S Max
Width	Max V	Due to Storm			
OF3595	0	0	1.479		
	0	0	0		0
OF3431	0	0	1.479		
	0	0	0		0
OF3923	0	0	1.479		
	0	0	0		0
OF4173	0	0	1.479		
	0	0	0		0

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max	Q
	Max Q	Max Q		
			Total	Low
Level	High Level			
BIOBASIN		20.03	4.3	
	0.053	0.053	0.000	
Basin1395		17.82	52.3	
	0.086	0.086	0.000	

Run Log for 181003 run at 20:02:06 on 8/10/2018
No water upwelling from any pit. Freeboard was adequate at all pits.
Flows were safe in all overflow routes.

0.2EY AEP Design:

DRAINS results prepared from Version 2018.06

PIT / NODE DETAILS

Name	Max HGL	Max Pond	Version 8 Max Surface	Max
Pond	Min	Overflow	Constraint	

	Volume	HGL Freeboard	Flow (cu.m/s) (cu.m/s)	Arriving
	(cu.m)	(m)		
GD	19.49		0.020	
		0.91	0.000	None
B1	19.40		0.000	
		0.90		None
B2	15.87		0.000	
		4.23		None
B3	15.57		0.000	
		4.13		None
B4	15.35		0.000	
		1.00		None
B5	15.28		0.000	
		1.07		None
B6	15.21		0.000	
		1.29		None
B7	15.12	16.53	0.008	
	0.2	1.38	0.000	Inlet Capacity
N16617	15.04		0.000	
Pit13910	19.07	19.68	0.019	
	3.4	0.58	0.000	Inlet Capacity
N19394	16.07		0.012	
roof	21.94		0.074	
C1	21.04		0.000	
		0.81	0.000	None
c2	19.74		0.000	
		0.81		None
N21684	16.65		0.000	

SUB-CATCHMENT DETAILS

Name	Max Paved Flow Q (cu.m/s)	Paved Grassed Max Q (cu.m/s)	Grassed Supp. Max Tc (cu.m/s)	Due to Storm Q
	Tc (min)	Tc (min)	Tc (min)	
GD	0.014	0.007	0.007	
	5.00	5.00	5.00	0.2EY AEP, 10 min burst, Storm 8
Cat5635	0.006	0.006	0.000	
	5.00	5.00	5.00	0.2EY AEP, 5 min burst, Storm 1
Cat4892	0.031	0.017	0.014	
	5.00	5.00	5.00	0.2EY AEP, 10 min burst, Storm 8
Cat5382	0.013	0.008	0.005	
	5.00	5.00	5.00	0.2EY AEP, 10 min burst, Storm 8
TRAPPED LOW PT		0.005	0.005	
	0.000	5.00	5.00	
	5.00	0.2EY AEP, 5 min burst, Storm 1		
ROOF	0.010	0.010	0.000	
	5.00	5.00	5.00	0.2EY AEP, 5 min burst, Storm 1
ROOF	0.061	0.061	0.000	
	5.00	5.00	5.00	0.2EY AEP, 5 min burst, Storm 1
TO BASIN		0.057	0.037	
	0.020	5.00	5.00	
	5.00	0.2EY AEP, 10 min burst, Storm 8		

PIPE DETAILS

Name	Max Q Max D/S (cu.m/s)	Max V Due to Storm (m/s)	Max HGL (m)	U/S HGL (m)
P Roof	0.014	1.04	19.489	
	19.397	0.2EY AEP, 10 min burst, Storm 8		
P13942	0.014	1.04	19.395	
	19.246	0.2EY AEP, 10 min burst, Storm 8		
Pipe13954		0.042	0.92	
	15.869	15.568	0.2EY AEP, 10 min burst, Storm 4	
P13956	0.038	0.75	15.568	
	15.351	0.2EY AEP, 10 min burst, Storm 4		
P13960	0.046	0.78	15.351	
	15.275	0.2EY AEP, 30 min burst, Storm 9		

P13963	0.046	0.76	15.275
	15.208	0.2EY AEP, 30 min burst, Storm 9	
P13966	0.052	0.82	15.208
	15.116	0.2EY AEP, 30 min burst, Storm 9	
Pipe14015		0.056	1.07
	15.116	15.044	0.2EY AEP, 30 min burst, Storm 9
Pipe14021		0.029	1.17
	19.280	19.163	0.2EY AEP, 10 min burst, Storm 8
P16215	0.009	0.74	19.070
	15.351	0.2EY AEP, 30 min burst, Storm 10	
Pipe16306		0.010	1.88
	16.073	15.208	0.2EY AEP, 5 min burst, Storm 1
Pipe18094		0.061	3.23
	21.939	21.042	0.2EY AEP, 5 min burst, Storm 1
Pipe18095		0.058	1.27
	21.037	19.736	0.2EY AEP, 5 min burst, Storm 1
Pipe18096		0.061	3.26
	19.721	18.093	0.2EY AEP, 5 min burst, Storm 1
P18119	0.079	1.50	17.338
	16.651	0.2EY AEP, 10 min burst, Storm 3	

CHANNEL DETAILS

Name	Max Q	Max V Due to Storm
	(cu.m/s)	(m/s)

OVERFLOW ROUTE DETAILS

Name	Max Q U/S Safe Q	Max D	Max DxV	Q	D/S Max
Width	Max V	Due to Storm			
OF3595	0	0	0.908		
	0	0	0		0
OF3431	0	0	0.908		
	0	0	0		0
OF3923	0	0	0.908		
	0	0	0		0
OF4173	0	0	0.908		
	0	0	0		0

DETENTION BASIN DETAILS

Name	Max WL Max Q	MaxVol Max Q	Max Total	Q Low
Level	High Level			
BIOBASIN		20.00	3.5	
	0.029	0.029	0.000	
Basin1395		17.68	9.0	
	0.079	0.079	0.000	

Run Log for 181003 run at 20:03:02 on 8/10/2018
No water upwelling from any pit. Freeboard was adequate at all pits.
Flows were safe in all overflow routes.