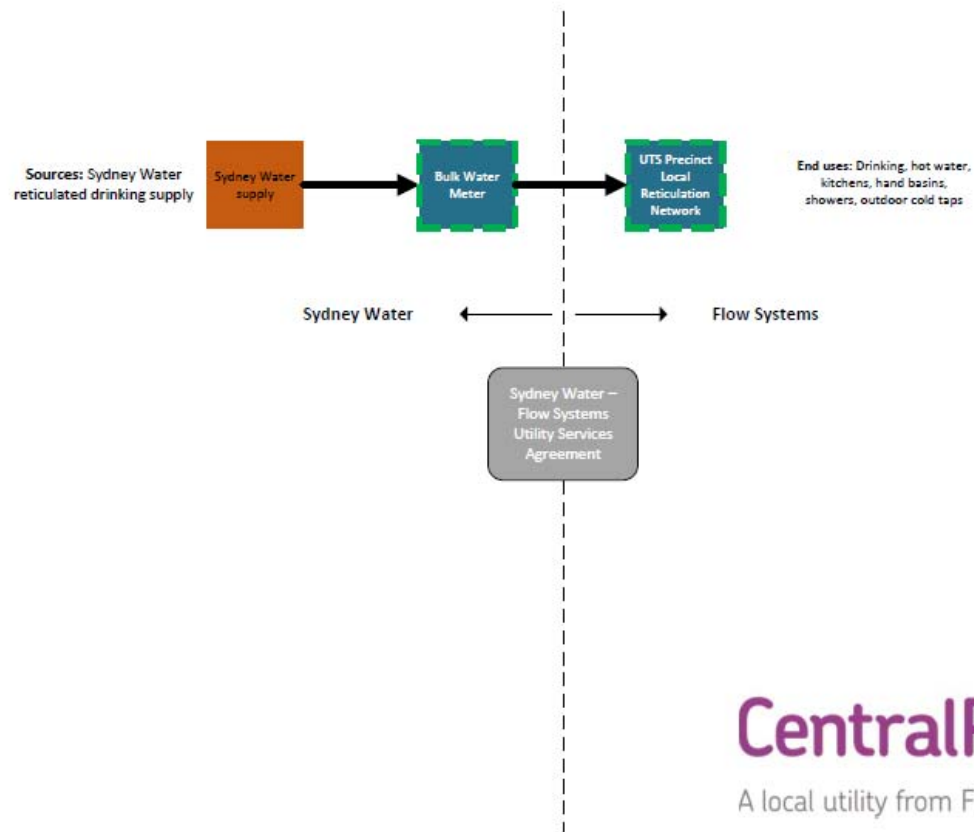


**Quality Control Points (QCP)
for Water Quality**

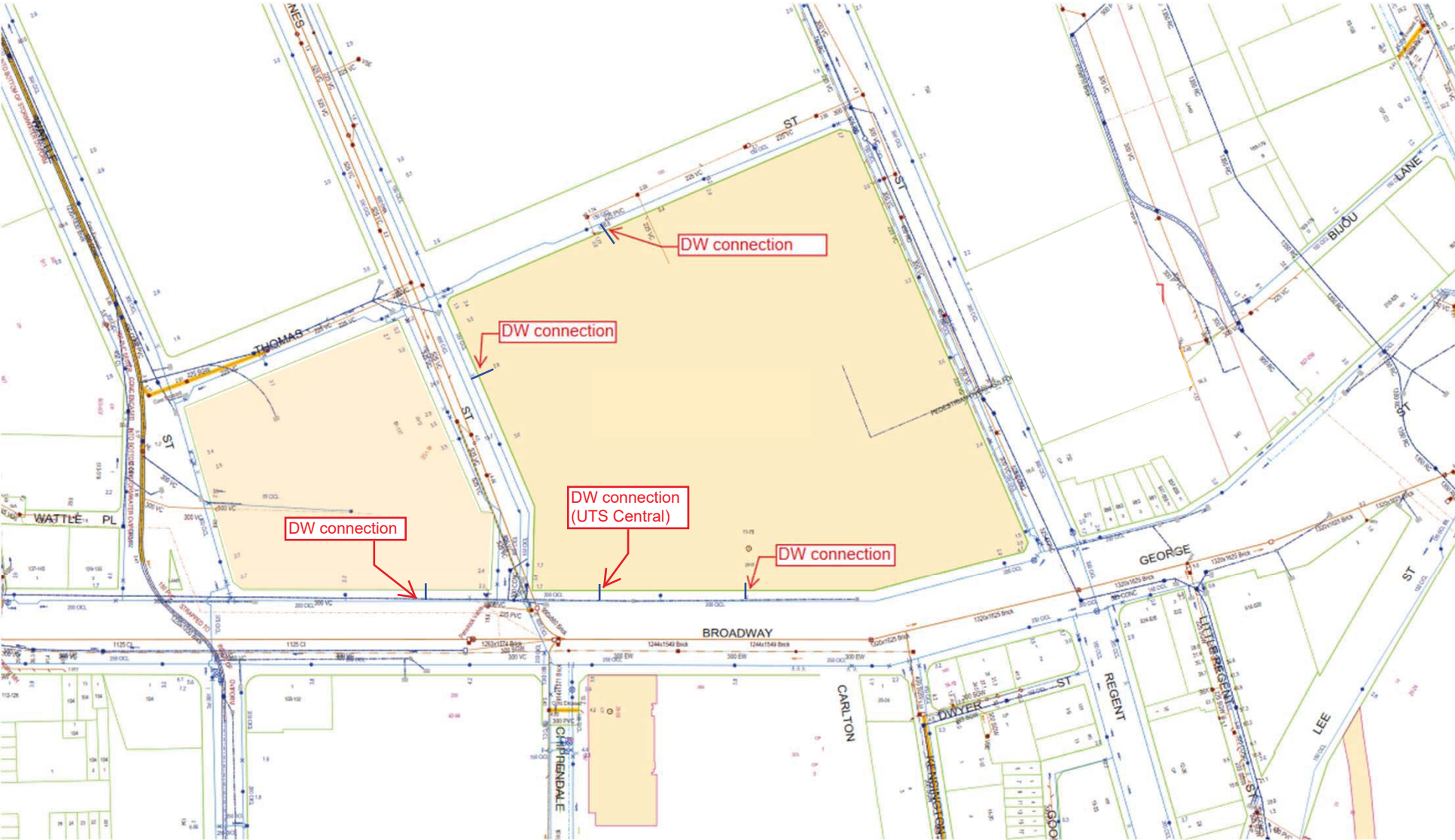
- Bulk water meter
- Pressure
- Drinking Water Distribution
- Turbidity
- pH
- Free Chlorine



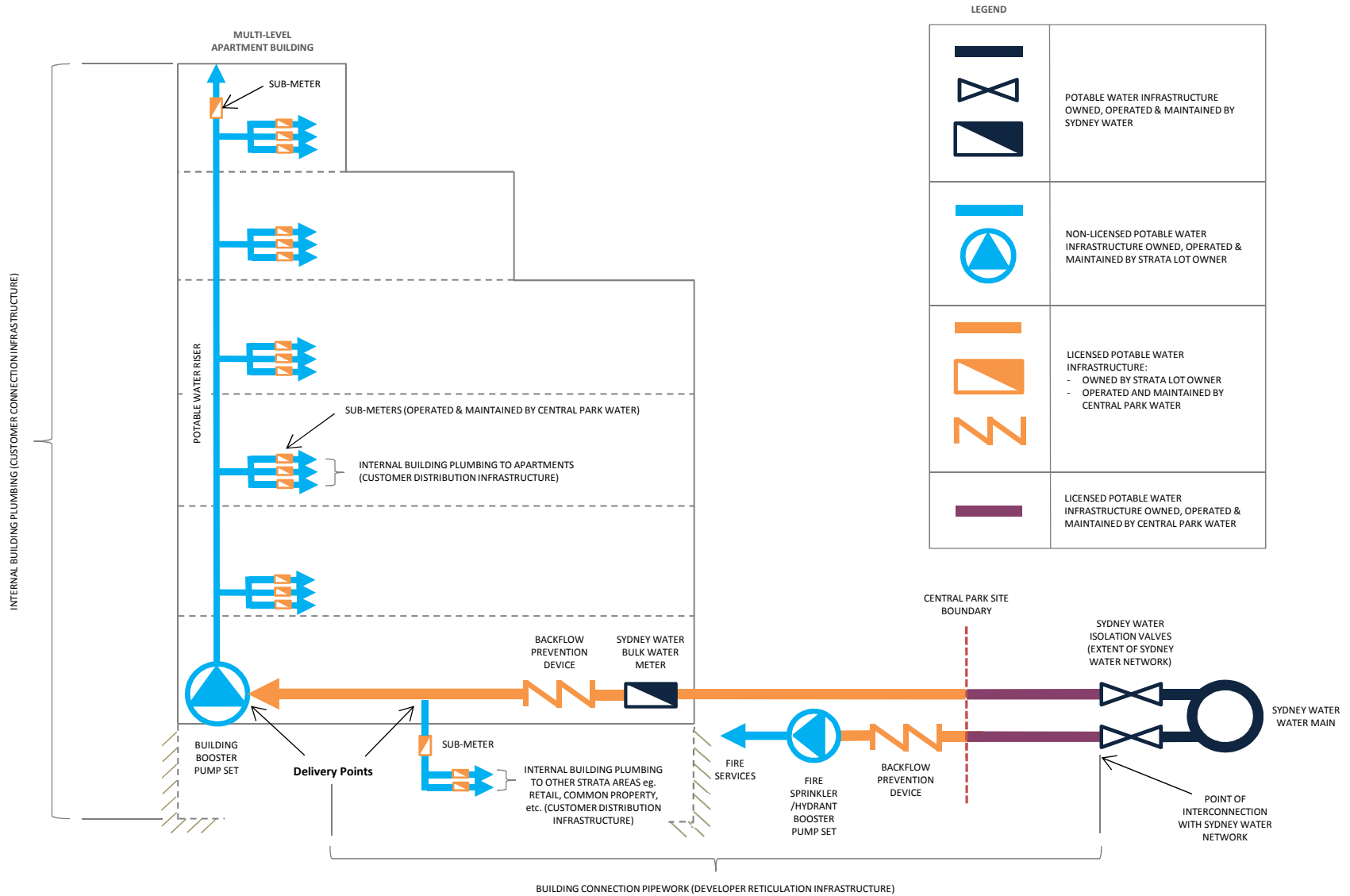
CentralPark + Plus

A local utility from Flow

DRINKING WATER NETWORK MASTERPLAN



POTABLE WATER INFRASTRUCTURE – TYPICAL OWNERSHIP & O+M RESPONSIBILITY SCHEMATIC



Case Number: **162116**

23 May 2017

UNIVERSITY OF TECHNOLOGY
C/- Calibre Consulting (NSW) Pty Ltd

NOTICE OF REQUIREMENTS
for
SECTION 73 SUBDIVIDER/DEVELOPER COMPLIANCE CERTIFICATE
(Sydney Water Act 1994, Part 6, Division 9)

Developer: UNIVERSITY OF TECHNOLOGY
Your reference: 15-002874
Development: Lot 2012 DP 1183894 (No. 11-79) Broadway, Ultimo
Development Description: Construction and use of an education building including: site preparation works, including demolition of existing Building 2 to ground level and associated tree removal, construction of a new 15 storey building 2, including a part five storey podium and one level of plant, above an existing two level basement, construction of a four storey extension of podium of Building 1 along Broadway, public domain improvements works, landscaping works, staged construction of the two buildings and extension and augmentation of physical infrastructure/utilities
Consent Ref: SSD 7382 by Department of Planning and Environment dated 23 September 2016
Your application date: 11 April 2017

Dear Applicant,

Sydney Water has assessed your application for a Section 73 Compliance Certificate (the Certificate) for the development shown above. Before Sydney Water can issue the Certificate, you must meet all the requirements set out in this notice and summarised in the following document *What You Must Do To Get A Section 73 Certificate*.

You have until 23 May 2018 to meet those requirements and receive the Certificate. If you have not received the Certificate by then you will have to reapply (and pay another application fee) and Sydney Water will issue you with a new notice. We may have extra requirements and charges may change in the new notice.

The Water Servicing Coordinator (Coordinator) will be your point of contact with Sydney Water. They can answer most questions you might have on our developer process and charges.

You can also find out about this process by visiting www.sydneywater.com.au > Plumbing, building & developing > Developing > Land Development. (If you want to find out the status of your application, simply select 'Developer Application Progress' and enter you case number

(shown above) and email address. A response will be sent automatically to you.

What You Must Do To Get A Section 73 Certificate

Summary

This is a summary of Sydney Water's requirements. The detailed list begins on the next page.

You must do the following things:

1. Have your building plans approved because what you are building may be over or near our pipes and we need to check your property building plans. Your Coordinator can tell you more about this and help with the approval.

Other things you need to do: Not required for your Section 73 Certificate.

At the end of this Notice are some other things that you may need to do. They are NOT a requirement to be met before the Certificate can issue but may well be a requirement of Sydney Water in the future because of the impact of your development on our assets. You must read them before you go any further.

DETAILED REQUIREMENTS

1. Approval of your Building Plans

You must have your building plans approved **before the Certificate can be issued. Building construction work MUST NOT commence until Sydney Water has granted approval.** Approval is needed because construction/building works may affect Sydney Water's assets (e.g. water, sewer and stormwater mains).

Where a Sydney Water stormwater channel, pipe or culvert is located within ten (10) metres of your development site it must be referred to Sydney Water for further assessment.

Your Coordinator can tell you about the approval process including:

- Your provision, if required, of a "Services Protection Report" (also known as a "pegout"). This is needed to check whether the building and engineering plans show accurately where Sydney Water's assets are located in relation to your proposed building work. Your Coordinator will then either approve the plans or make requirements to protect those assets before approving the plans;
- Possible requirements;
- Costs; and
- Timeframes.
- You can also find information about this process (including technical specifications) if you either:
 - Visit www.sydneywater.com.au > Plumbing, building & developing > Building > Building over or next to assets. Here you can find Sydney Water's *Technical guidelines - Building over and adjacent to pipe assets*; or
 - Call 13 20 92.

Notes:

- **The Certificate will not be issued until the plans have been approved and, if required, Sydney Water's assets are altered or deviated;**
- **You can only remove, deviate or replace any of Sydney Water's pipes using temporary pipework if you have written approval from Sydney Water's Urban Growth Business. You must engage your Coordinator to arrange this approval; and**
- **You must obtain our written approval before you do any work on Sydney Water's systems. Sydney Water will take action to have work stopped on the site if you do not have that approval. We will apply Section 44 of the *Sydney Water Act 1994*.**

OTHER THINGS YOU NEED TO DO

Shown below are other things you need to do that are NOT a requirement for the Certificate. They may well be a requirement of Sydney Water in the future because of the impact of your development on our assets. You must read them before you go any further.

Water, Sewer and Stormwater Information

- a) **Water**

Your development must have a frontage to a water main that is the right size and can be used for connection.

Sydney Water has assessed your application and found that:

- The proposed development can utilise existing drinking water connections

b) **Sewer**

Your development must have a sewer main that is the right size and can be used for connection.

Sydney Water has assessed your application and found that:

- The proposed development can utilise existing wastewater connections

c) **Stormwater**

- There are no specific Sydney Water stormwater requirements for the proposed development at this location.

Disused Sewerage Service Sealing

Please do not forget that you must pay to disconnect all disused private sewerage services and seal them at the point of connection to a Sydney Water sewer main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Soffit Requirements

Please be aware that floor levels must be able to meet Sydney Water's soffit requirements for property connection and drainage.

Fire Fighting

Definition of fire fighting systems is the responsibility of the developer and is not part of the Section 73 process. It is recommended that a consultant should advise the developer regarding the fire fighting flow of the development and the ability of Sydney Water's system to provide that flow in an emergency. Sydney Water's Operating Licence directs that Sydney Water's mains are only required to provide domestic supply at a minimum pressure of 15 m head.

A report supplying modelled pressures called the Statement of Available pressure can be purchased through Sydney Water Tap inTM and may be of some assistance when defining the fire fighting system. The Statement of Available pressure, may advise flow limits that relate to system capacity or diameter of the main and pressure limits according to pressure management initiatives. If mains are required for fire fighting purposes, the mains shall be arranged through the water main extension process and not the Section 73 process.

Large Water Service Connection

A water main is available to provide your development with a domestic supply. The size of your development means that you will need a connection larger than the standard domestic 20 mm size.

To get approval for your connection, you will need to lodge an application with Sydney Water Tap inTM. You, or your Hydraulic Consultant, may need to supply the following:

- A plan of the hydraulic layout;
- A list of all the fixtures/fittings within the property;
- A copy of the fireflow pressure inquiry issued by Sydney Water;
- A pump application form (if a pump is required);
- All pump details (if a pump is required).

You will have to pay an application fee.

Sydney Water does not consider whether a water main is adequate for fire fighting purposes for your development. We cannot guarantee that this water supply will meet your Council's fire fighting requirements. The Council and your Hydraulic Consultant can help.

Disused Water Service Sealing

You must pay to disconnect all disused private water services and seal them at the point of connection to a Sydney Water water main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed plumber. The licensed plumber must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Other fees and requirements

The requirements in this Notice relate to your Certificate application only. Sydney Water may be involved with other aspects of your development and there may be other fees or requirements. These include:

- plumbing and drainage inspection costs;
- the installation of backflow prevention devices;
- trade waste requirements;
- large water connections and
- Council firefighting requirements. (It will help you to know what the firefighting requirements are for your development as soon as possible. Your Hydraulic Consultant can help you here).

END

Purpose

The purpose of undertaking the preliminary risk assessment was to:

- Identify potential risks that may impact the safe and reliable operation of the facility (and associated components), specifically focused on risks associated with the following:
 - Potential impacts to public health and/or water quality
 - Environmental impacts including noise, odour and general environmental impacts
 - Operational reliability and process performance
 - Financial viability
 - Customer service
- Identify early, potential risk mitigation/control measures that can be incorporated into the design, construction and operation of the facility to sufficiently mitigate these risks
- Facilitate further dialogue with all key stakeholders to ensure all key risks associated with the project are identified and effectively controlled.

Methodology

A risk assessment was conducted for provision of the following services:

- Sewage
- Recycled water
- Drinking water

The assessment approach adopted for conducting the sewage and recycled water preliminary risk assessments was consistent with the recommendations in the Australian Guidelines for Water Recycling (AGWR). The assessment criteria are provided in Attachment A.

The assessment approach adopted for conducting the drinking water preliminary risk assessment was consistent with the recommendations in the Australian Drinking Water Guidelines (ADWG). The assessment criteria are provided in Attachment B.

Business risks, or risks leading to a loss of service or complaints, were assessed using the Flow assessment criteria provided in Attachment C.

The preliminary risk assessment process included the following activities:

- **Risk Identification** – The identification of a range of risks related to the project (what might happen?)
- **Risk Categorisation** – The categorization of the risks into various types to aid understanding and to provide context.
- **Risk Assessment** – Determination of the likelihood and consequence of the unmitigated/uncontrolled risk (what is the likelihood and impact/consequence?)
- **Managing the Risk/Risk Mitigation** – the identification of appropriate controls to be further developed and implemented as appropriate should the project be approved to process (what can be done to stop it happening?)
- **Post Mitigation Risk Assessment** – the reassessment of the risk following implementation of appropriate controls to ensure that the risk is sufficiently mitigated (how effective do we anticipate the controls to be?)

Controls

Controls modify the likelihood or the impact of the risk (i.e. both the likelihood and consequence of a risk).

- Preventive controls apply at the beginning of a risk's life, at or near the root causes(s). As a device, they often act as a barrier to "nip it (the risk) in the bud". They primarily reduce the likelihood of the risk occurring. Examples are system passwords, locked doors, machinery maintenance etc.
- Detective controls usually apply somewhere in the middle of the risk's life. Detective controls rely on the analysis of information in order to detect that a risk is "in motion". Detective controls that are "early" in the risk's life usually modify likelihood and those that are "late" in the life, usually modify impact. Examples are online monitoring, inspections, complaints and incident monitoring etc.
- Reactive controls (sometimes also called Responsive or Corrective), apply towards the end of a risk's life when the impact is imminent or being felt. They are focused on modifying impact. Examples are plant shutdown, drinking water top up, incident and emergency response processes.

Risk rating before and after controls

The risk rating after controls is a risk assessment with controls in place. As explained above, controls can modify both the likelihood and consequence of a risk.

The qualitative descriptions for consequence or impact contained in the recommendations of the AGWR and ADWG (refer to Attachments A and B), use a combination of the scale of the impact and the size of population or ecosystem affected. If the controls can reduce the scale of the impact or size of the population or ecosystem affected, then the overall risk rating can be reduced.

Examples include:

Drinking water - The risk of a low disinfection residual will lead to lower disinfection, but there will still be a level of disinfection, thereby reducing the scale of the impact and the size of the population affected.

Sewage – The risk of sewage overflow is mitigated by rapid response and isolation reducing the quantity of sewage released, and/or the flows to sensitive receiving environments being diverted, and therefore the scale and size of the ecosystems affected.

Recycled water - The risk of process failure is mitigated by a multi-barrier treatment approach and plant shutdown if critical control points are exceeded.

Outcomes

Sewage Risk Assessment

In undertaking the preliminary risk assessment, risks were identified across the following areas:

Area	Descriptions
The Catchment	Risks associated with the catchment area including consideration of items such as contamination, volume changes, public health incidents, storage requirements, illegal discharge to sewers etc.
The Sewer Network	Risks associate with the network itself including blockages, pipe or equipment failure, loss of power etc.
Management	General operation management issues risks that may impact operational reliability or supply surety.

Risks have been summarise at Attachment D as the detailed preliminary risk assessment contains information that is commercial in confidence.

Recycled Water Risk Assessment

In undertaking the preliminary risk assessment, risks were identified across the following areas:

Area	Descriptions
Local Water Centre	Consideration of the potential risk associated with the operation of the treatment facility including tank and/or equipment failure, odour, noise, process risks, capacity, power failure, telemetry, vandalism, operator error, flooding etc.
Recycled Water Reticulation and Use	Risks associated with the storage and distribution of recycled water to users and considered areas such as equipment failure, demand, unauthorized usage, water quality, security, power failure etc.
Management	General operation management issues risks that may impact operational reliability or supply surety.

Risks have been summarise at Attachment E as the detailed preliminary risk assessment contains information that is commercial in confidence.

Drinking Water Risk Assessment

In undertaking the preliminary risk assessment, risks were identified across the following areas:

Area	Descriptions
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Preliminary Risk Assessment Summary for Central Park

Supply	Consideration of the potential risk associated with the supply of drinking water from a public water authority
Potable Water Reticulation and Use	Risks associated with the storage and distribution of drinking water to users and considered areas such as equipment failure, demand, unauthorized usage, water quality, security, power failure etc.
Management	General operation management issues risks that may impact operational reliability or supply surety.

Risks have been summarise at Attachment F as the detailed preliminary risk assessment contains information that is commercial in confidence.

Attachment A Qualitative Risk Assessment Criteria as per the AGWR

Risk Matrix - Australian Guidelines for Water Recycling

Likelihood	A Almost certain	Low	Moderate	High	Very High	Very High
	B Likely	Low	Moderate	High	Very High	Very High
	C Possible	Low	Moderate	High	Very High	Very High
	D Unlikely	Low	Low	Moderate	High	Very High
	E Rare	Low	Low	Low	High	High
		Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Consequence						

Likelihood (qualitative measures)

Level	Descriptor	Example description
A	Almost certain	Is expected to occur, with probability of multiple occurrences within a year.
B	Likely	Will probably occur within a 1-5 year period.
C	Possible	Might occur or should be expected to occur within 5-10 year period.
D	Unlikley	Could occur within 20 years or in unusual circumstances.
E	Rare	May occur in exceptional circumstances; may occur once in 100 years.

Consequence or impact (qualitative measures)

Level	Descriptor	Example description
1	Insignificant	Insignificant impact or not detectable.
2	Minor	Health - minor impact for small population Environment - potentially harmful to local ecosystem with local impacts contained to site.
3	Moderate	Health - minor impact for large population Environment - potentially harmful to regional ecosystem with local impacts primarily contained on site.
4	Major	Health - major impact for small population Environment - potentially lethal to local ecosystem. Predominantly local, but potential for off-site impacts.
5	Catastrophic	Health - major impact for large population Environment - potentially lethal to regional ecosystem or threatened specias. Widespread on-site and off-site impacts.

Note:

1. The levels used for "Likelihood" have been changed to be the same as the ADWG i.e. A = Almost certain. In the AGWR A = Rare.

Attachment B Qualitative Risk Assessment Criteria as per the ADWG

Risk Matrix - Australian Drinking Water Guidelines

Likelihood	A Almost certain		Moderate	High	Very High	Very High	Very High
	B Likely		Moderate	High	High	Very High	Very High
	C Possible		Low	Moderate	High	Very High	Very High
	D Unlikely		Low	Low	Moderate	High	Very High
	E Rare		Low	Low	Moderate	High	High
			Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Consequence							

Likelihood (qualitative measures)

Level	Descriptor	Example description
A	Almost certain	Is expected to occur in most circumstances.
B	Likely	Will probably occur in most circumstances.
C	Possible	Might occur or should occur at some time.
D	Unlikely	Could occur at some time.
E	Rare	May occur only in exceptional circumstances.

Consequence or impact (qualitative measures)

Level	Descriptor	Example description
1	Insignificant	Insignificant impact, little disruption to normal operation, low increase in normal operation costs.
2	Minor	Minor impact for small population, some manageable operation design interruption, some increase in operating costs.
3	Moderate	Minor impact for large population, significant modification to normal operation but manageable, operation costs increased, increased monitoring.
4	Major	Major impact for small population, systems significantly compromised and abnormal operation if at all, high level of monitoring required.
5	Catastrophic	Major impact for large population, complete failure of system.



Preliminary Risk Assessment Summary for Central Park

Attachment C Flow's Qualitative Risk Assessment Criteria

Risk Matrix - Flow Systems

Likelihood	A Almost certain		Low	Medium	High	Very High	Very High
	B Likely		Low	Medium	High	Very High	Very High
	C Possible		Minimal	Low	Medium	High	Very High
	D Unlikely		Minimal	Minimal	Low	Medium	High
	E Rare		Minimal	Minimal	Low	Medium	High
			Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
			Consequence				

Attachment C Flow's Qualitative Risk Assessment Criteria *cont.*

Likelihood (qualitative measures)

Level	Descriptor	Example description (Flow)
A	Almost certain	Expected to occur in most circumstances. Greater than 90% chance of occurrence. More than once per year.
B	Likely	Will probably occur in most circumstances. 65%-90% chance of occurrence Once in 1-2 years
C	Possible	Might occur or should occur at some time. 35%-65% chance of occurrence Once in 2-5 years
D	Unlikley	Could occur in unusual circumstances. 10%-35% chance of occurrence. Once in 5- 20 years.
E	Rare	May occur only in exceptional circumstances. Less than 10% chance of occurrence. Once in 20 years

Consequence or impact (qualitative measures)

Level	Descriptor	Example description
1	Insignificant	No material financial consequence to Flow Cost <\$10k 1-2 customers impacted. Little disruption to normal operation, low increase in normal operation costs.
2	Minor	Some financial consequences to Flow Cost \$10k-100k. 2-10 customers or a whole street impacted. May require notification but no other extraordinary activities. Some manageable operation disruption, some increase in operating costs.
3	Moderate	Considerable financial consequences to Flow. Cost \$100k-\$250k. Subdivision of community or whole development stage impacted. Significant negative consequences requiring additional actions to rectify. Negative client / customer reaction but temporary. Significant modification to normal operation but manageable, operation costs increased, increased monitoring.
4	Major	Material financial consequences to Flow Cost \$250k-\$1 million. Whole community impacted. High likelihood of adverse client/ customer reaction (e.g. lawsuits). May lose some clients / customers permanently. Systems significantly compromised and abnormal operation if at all, high level of monitoring required.
5	Catastrophic	Such significant financial consequences to Flow that its ability to operate is threatened. Cost > \$1 million. More than one community impacted. Adverse client / customer reaction (e.g. lawsuits). Permanent loss of multiple clients / customers. Flow's key point of contact with IPART in the short term. Complete failure of systems.

Attachment D – Preliminary Risk Assessment Summary – Sewage

Risk ID	Component	Potential Risk	Pre-mitigation Risk	Controls	Post-mitigation Risk (or residual risk)
SW 1.1	Whole of system	Failure of overarching sewer management plan	High	<ul style="list-style-type: none"> Additional controls as listed for each individual risk below. Preventive: <ul style="list-style-type: none"> Business Management System (BMS) independently verified to the International Standards ISO 9001 for quality management, ISO 14001 for environmental management and ISO 45001 for safety management Regular audits by auditors from the regulator's (IPART) independent panel of auditors. Regular internal process and compliance audits are a component of the Flow BMS. Review of resource requirements as part of Flow's business planning and budgeting process. Annual review of BMS and water quality management plans. Regulator oversight and enforcement action. Skilled and trained operators. Competency based training system. Detective: <ul style="list-style-type: none"> Consumer complaints Operator inspections Reactive: <ul style="list-style-type: none"> Incident & Emergency Management Plan and associated processes to ensure a rapid and effective incident response and to prevent incident escalation. Incident Notification Protocol with NSW Health to ensure risks to public health are controlled quickly Qualified contractors engaged to provide rapid response to faults and emergencies including sewage overflows. Pollution incident notification as per POEO Act requirements Water Industry Competition Act's Operator of Last Resort provisions and step in rights 	Low
SDW 1.1	Delivery of developer works	Delays in construction and delivery of infrastructure by developer	Very High	<ul style="list-style-type: none"> Compliance Certificate only issued when developer completes works If works delayed, developer pays bond to Flow and Flow will deliver infrastructure ISO 9001 certified project management processes including project meetings, program updates, and reporting. Generators if delay related to connection to power. Other reactive contingency measures dependent on service i.e. : sewage tankering, drinking water tankering, deployment of extra pumps 	Low
SDW 1.2	Delivery of Local Water Centre	Delays in construction and delivery of Local Water Centre by Flow	Very High	<ul style="list-style-type: none"> ISO 9001 certified project management processes to ensure timely delivery of infrastructure Early identification of contingency measures through modelling. Sewage tankering Provision of drinking water through recycled water network. 	Low
SC 1.3 SC 1.4	Collection system (Sewer main)	Sewage escape from sewer main due to third party damage	Very High	<ul style="list-style-type: none"> Dial Before You Dig (DBYD) Pressure monitoring and alarms of network 	Low

				<ul style="list-style-type: none"> Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation. 	
SL 1.6 SL 1.10	Local Water Centre (Flow Balance Tank)	Overflow from tank	High	<ul style="list-style-type: none"> Design, production, installation and testing by qualified contractors and quality assurance to AS3735 Water Retaining Structures. Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation. 	Low
SL 1.8 SL 1.9 SL 1.10	Local Water Centre (Flow Balance Tank)	Operational failure	High	<ul style="list-style-type: none"> Flow Balance Tank in secure environment without public access Standard equipment type so spares easily available on short lead times Duty / standby of equipment Inlet and product water buffer storage Spares of critical equipment on site Monitoring and controls Proactive maintenance regime Experienced operators Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation. Tankering company on emergency callout contract. Generator back-up Additional network storage in on-lot wastewater collection tanks 	Low
SL 1.11	Local Water Centre	Inability to service customers	Very High	<ul style="list-style-type: none"> Standard equipment type so spares easily available on short lead times Duty / standby of equipment Inlet and product water buffer storage Spares of critical equipment on site Monitoring and controls Proactive maintenance regime Experienced operators Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation. Tankering company on emergency callout contract Generator back-up Additional network storage in on-lot wastewater collection tanks 	Low

Attachment E – Preliminary Risk Assessment Summary – Recycled Water

Risk ID	Component	Potential Risk	Pre-mitigation Risk (or)	Controls	Post-mitigation Risk (or residual risk)
RW 1.1	Whole of system	Failure of overarching recycled water quality plan	Very High	<ul style="list-style-type: none"> Additional controls as listed for each individual risk below. Preventive: <ul style="list-style-type: none"> Business Management System (BMS) independently verified to the International Standards ISO 9001 for quality management, ISO 14001 for environmental management and ISO 45001 for safety management Regular audits by auditors from the regulator's (IPART) independent panel of auditors. Regular internal process and compliance audits are a component of the Flow BMS. Review of resource requirements as part of Flow's business planning and budgeting process. Annual review of BMS and water quality management plans. Regulator oversight and enforcement action. Skilled and trained operators. Competency based training system. Detective: <ul style="list-style-type: none"> Consumer complaints Operator inspections Reactive: <ul style="list-style-type: none"> Incident & Emergency Management Plan and associated processes to ensure a rapid and effective incident response and to prevent incident escalation. Incident Notification Protocol with NSW Health to ensure risks to public health are controlled quickly Qualified contractors engaged to provide rapid response to faults and emergencies including sewage overflows. Pollution incident notification as per POEO Act requirements Water Industry Competition Act's Operator of Last Resort provisions and step in rights 	Low
RDW 1.1	Delivery of developer works	Delays in construction and delivery of infrastructure by developer	Very High	<ul style="list-style-type: none"> Compliance Certificate only issued when developer completes works If works delayed, developer pays bond to Flow and Flow will deliver infrastructure ISO 9001 certified project management processes including project meetings, program updates, and reporting. Generators if delay related to connection to power. Other reactive contingency measures dependent on service i.e. : sewage tankering, drinking water tankering, deployment of extra pumps 	Low
RDW 1.2	Delivery of Local Water Centre	Delays in construction and delivery of Local Water Centre by Flow	Very High	<ul style="list-style-type: none"> ISO 9001 certified project management processes to ensure timely delivery of infrastructure Early identification of contingency measures through modelling. Sewage tankering Provision of drinking water through recycled water network. 	Low
RC 1.1 RC 1.2	Collection System	Raw sewage characteristics are	Very High	<ul style="list-style-type: none"> Design influent parameters based on industry guidelines for water efficient homes. 	Low

RC 1.3		outside of design influent parameters		<ul style="list-style-type: none"> Treatment process log reduction is greater than the minimum for required uses. Community education i.e. new owner information packs, newsletters, school experience programmes etc. used to inform the public on what can be disposed of down the sewer. Trade Waste Agreements with retail and commercial users Multiple treatment barrier approach Automatic plant shutdown when critical control points are breached. Key process parameters are monitored and alarms generated should these indicate a toxic event. 	
RL 1.1	Local Water Centre	Process equipment damage / failure	Very High	<ul style="list-style-type: none"> Duty / standby of equipment Inlet and product water buffer storage Spares of critical equipment on site Monitoring and controls Proactive maintenance regime Experienced operators Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation. Tankering company on emergency callout contract. Site security 	Low
RL 1.6					
RL 1.8					
RL 1.10					
RL 1.13					
RL 1.2	Local Water Centre	Process performance outside operational parameters	Very High	<ul style="list-style-type: none"> Duty / standby of equipment Inlet and product water buffer storage Spares of critical equipment on site Monitoring and controls Proactive maintenance regime Experienced operators Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation. Tankering company on emergency callout contract. 	Low
RL 1.4					
RL 1.7					
RL 1.9					
RL 1.12					
RL 1.3	Local Water Centre	Tank failure	Very High	<ul style="list-style-type: none"> Design, production, installation and testing by qualified contractors and quality assurance to AS3735 Water Retaining Structures. Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation. 	Low
RL 1.5					
RL 1.11	Local Water Centre	Supply of chemicals is exhausted or degraded/poor quality	Very High	<ul style="list-style-type: none"> Tanks sized for adequate storage but with regular ordering of small volumes due to degradation over time Recycled water production will cease if chemicals are not available. Chemical supply contract with minimum and emergency supply provisions. Skilled operators with documented operational procedure. Chemical storage tanks are fitted with level devices to ensure levels are continuously monitored. 	Low
RL 1.14					
RL 1.15	Local Water Centre	Chemical spill	Very High	<ul style="list-style-type: none"> Chemicals stored within weatherproof, bunded area as per Australian standards Chemical loading area within bunded area Chemical delivery procedures Trained and inducted delivery drivers Spill response procedure Tankering company on emergency callout contract Incident and Emergency Management Plan and processes 	Low
RL 1.16	Local Water Centre	Incorrect chemical delivery	Very High	<ul style="list-style-type: none"> Colour coded and labelled intake nozzles for chemical tanks 	Low

RL 1.17 RL 1.18 RL 1.19 RL 1.20	Local Water Centre	Disaster Emergency such as fire, lightning, vandalism, theft, power failure	Very High	<ul style="list-style-type: none"> Chemical supply agreements and operational procedures Chemical delivery procedures Trained and inducted delivery drivers Tankering company on emergency callout contract Incident and Emergency Management Plan and processes 	Low
RL 1.23 RL 1.24	Local Water Centre	Poor aesthetics / Noise	Very High	<ul style="list-style-type: none"> In the event of power failure onsite back-up generator used to maintain key process units. Regular maintenance of back up generator Ability to source an offsite generator as a backup UPS system installed to ensure control and access to the plant is still maintained. Top-up with drinking water Firefighting system for the LWC from both potable and recycled water system Incident and Emergency Management Plan and processes 	Low
RL 1.25	Local Water Centre	PLC / SCADA failure	Very High	<ul style="list-style-type: none"> Local Water Centre has been designed to blend in with the local environment whilst not hiding its core activity. Building layout has been designed to facilitate scheduled visits from interested stakeholders. All odour generating equipment has been fitted with covers and odour treatment as required. Odour modelling has been undertaken to confirm that expected impact on surrounding stakeholders is negligible. H₂S monitoring on odour control vent All noise generating equipment has been fitted with acoustic covers. Further acoustic treatment has been provided on the Local Water Centre building. Noise modelling has been used to confirm that expected impact on surrounding stakeholders is negligible. 	Low
RD 1.1 RD 1.2	Recycled Water Distribution	Tank overflow / failure	Low	<ul style="list-style-type: none"> Local Water Centre can continue operation in the event telemetry is lost. Automatic LWC shutdown on PLC failure Operating procedure to respond to PLC failure Data capture will continue on the local SCADA and PLC. Plant would shut down if parameters were out of specification. Top up with drinking water Software and hardware back up Supply agreement with telemetry with emergency response provision 	Low
RD 1.3 RD 1.4	Recycled Water Distribution	Cross connection	Very High	<ul style="list-style-type: none"> Design, production, installation and testing by qualified contractors and quality assurance Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation Tankering company on emergency callout contract 	Low
				<ul style="list-style-type: none"> Recycled water kept at lower pressure than drinking water thereby mitigating recycled water entering the system Colour coded, different materials, labelled pipes and marker tape QA inspections of house plumbing by NSW Office of Trading prior to handover / operation 	Low

				<ul style="list-style-type: none"> • Plumbing inspections triggered by DA process • OFT inspection and Flow's cross-connection plumbing check pre-conditions to Flow's connection of sewerage • QA checks on reticulation installation prior to handover to Flow (and Flow's issue of Certificate of Compliance) • Home builder education (website, Builders Guide) • Customer education (website, home owners guide, including translated services) • Backflow prevention at each house connection • Telemetry monitoring of drinking and recycled water usage to identify anomalous use • High quality recycled water has low risk of health impact. 	
RD 1.5	Recycled Water Distribution	Recycled water is used for unauthorized purposes	Very High	<ul style="list-style-type: none"> • Colour coded, different materials, labelled pipes and marker tape • Information packs will be supplied to householders on initial connection or with change of ownership. These information packs will clearly define the authorised uses for the recycled water. • Factsheets will be sent with billing information to householders reinforcing the authorised uses for the recycled water. • Community education on recycled water / website • Signage on recycled water taps • Telemetry monitoring of drinking and recycled water usage to identify anomalous use 	Low
RD 1.6	Recycled Water Distribution	Process equipment damage / failure	High	<ul style="list-style-type: none"> • Pumps are installed duty / standby with automatic changeover. • Maintenance contractor to be engaged under standard protocols to investigate cause of pump failure. • Maintenance contractor to be engaged under emergency protocols to repair pump(s) or install temporary pump or repair leak. • Standard equipment type so spares easily available on short lead times • Spares of critical equipment on site • Where possible, recycled water storage located at high elevation to allow gravity feed • Preventive maintenance on pumps • Reticulation pipe work will be provided with a number of valves enabling isolation of parts of the network. 	Low
RD 1.7	Recycled Water Distribution	Main break leading to discharge of recycled water	Moderate	<ul style="list-style-type: none"> • Reticulation pipe work will be provided with a number of valves enabling isolation of parts of the network. • Maintenance contractor to be engaged under emergency protocols to repair leak. • High quality recycled water • Dial Before You Dig (DBYD) • Automatic shut down on high flow* • Looped reticulation design and construction • Highlighting of single supply mains as high priority on DBYD where looping not possible • Pressure monitoring of the network for early alert of leaks 	Low

				<ul style="list-style-type: none"> Mechanical vehicle protection on storage tanks (height restrictions, bollards) Detectable marker tape over all mains 	
RD 1.9	Recycled Water Distribution	Demand exceeds supply	Moderate	<ul style="list-style-type: none"> Recycled water storage sized at >5 days of average production. Drinking water used to maintain supply if the recycled water storage tank drops below a minimum level. Membrane tank over-sized to allow for the option of stormwater harvesting to supplement the source water supply. 	Low
RD 1.10	Recycled Water Distribution	Health impact from exposure to water features	Very High	<ul style="list-style-type: none"> Signage indicating use of recycled water in water features and proper use High quality recycled water has low risk of health impact. 	Low
RD 1.11	Recycled Water Distribution	Supply exceeds demand	Very High	<ul style="list-style-type: none"> Implement Integrated Water Cycle Management (IWCM) Policy and regularly review scheme specific IWCM Plan. Seek additional recycled water customers. Detective: <ul style="list-style-type: none"> Monitor volumes, demands and trends and adjust operations to suit Identify properties with higher than average sewer consumers and target for illegal connection studies. Tankering Construct additional storage 	Low
RI 1.7	Recycled Water Irrigation (by Flow)	Poor irrigation practices	Moderate	<ul style="list-style-type: none"> Flow operates to ISO 14001 certified Environmental Management System Recycled Water Irrigation Management Plan (RWIMP), irrigation policies, procedures and systems implemented by trained and skilled staff Irrigation site selection criteria Seasonal irrigation to meet water balance requirements High quality recycled water treated for licensed end-use Water quality and soil monitoring in accordance with Flow Monitoring and Sampling Plan/Program Remote and in person monitoring of irrigation areas Visual inspection of irrigation areas and irrigation infrastructure 	Low

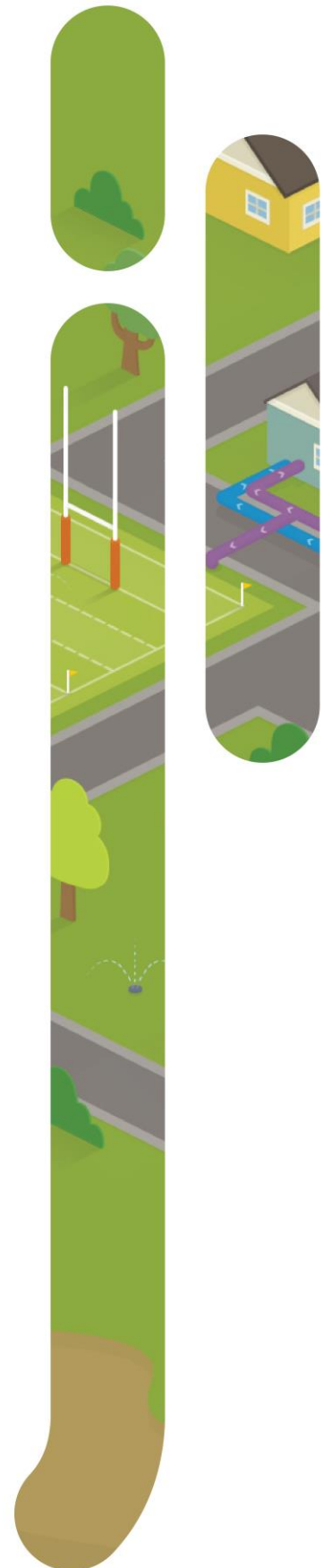
Attachment F – Preliminary Risk Assessment Summary – Drinking Water

Risk ID	Component	Potential Risk	Pre-mitigation Risk (or)	Controls	Post-mitigation Risk (or residual risk)
DW 1.1	Whole of system	Failure of overarching drinking water quality plan	Very High	<ul style="list-style-type: none"> Additional controls as listed for each individual risk below. Preventive: <ul style="list-style-type: none"> Business Management System (BMS) independently verified to the International Standards ISO 9001 for quality management, ISO 14001 for environmental management and ISO 45001 for safety management Regular audits by auditors from the regulator's (IPART) independent panel of auditors. Regular internal process and compliance audits are a component of the Flow BMS. Review of resource requirements as part of Flow's business planning and budgeting process. Annual review of BMS and water quality management plans. Regulator oversight and enforcement action. Skilled and trained operators. Competency based training system. Detective: <ul style="list-style-type: none"> Consumer complaints Operator inspections Reactive: <ul style="list-style-type: none"> Incident & Emergency Management Plan and associated processes to ensure a rapid and effective incident response and to prevent incident escalation. Incident Notification Protocol with NSW Health to ensure risks to public health are controlled quickly Qualified contractors engaged to provide rapid response to faults and emergencies including sewage overflows. Pollution incident notification as per POEO Act requirements Water Industry Competition Act's Operator of Last Resort provisions and step in rights 	Low
DDW 1.1	Delivery of developer works	Delays in construction and delivery of infrastructure by developer	Very High	<ul style="list-style-type: none"> Compliance Certificate only issued when developer completes works If works delayed, developer pays bond to Flow and Flow will deliver infrastructure ISO 9001 certified project management processes including project meetings, program updates, and reporting. Generators if delay related to connection to power. Other reactive contingency measures dependent on service i.e. : sewage tankering, drinking water tankering, deployment of extra pumps 	Low
DC 1.1 DC 1.2	Catchment (Connection to Public Water Utility)	Out of specification drinking water quality supplied by Public Water Utility	Very High	<ul style="list-style-type: none"> Utility Services Agreement with supplying water authority obliging the need to meet ADWG in supply water Agreed communications protocols between local water utility and supplying water authority forming part of the USA Accredited laboratory water quality testing by Flow Systems (quarterly grab samples and upon incident notification) Incident and Emergency Management Plan and processes Incident notification protocols with Public Health Unit and determine appropriate public health response 	Low

DC 1.3	Catchment (Connection to Public Water Utility)	Interruption to supply	Moderate	<ul style="list-style-type: none"> Utility Services Agreement between local water utility and supplying water authority Agreed communications protocols between local water utility supplying water authority forming part of the USA Pressure monitoring at or near the bulk supply points Provide tankered / bottled water Incident and Emergency Management Plan and processes 	Low
DD 1.1 DD 1.2	Drinking Water Distribution	Main break	Very High	<ul style="list-style-type: none"> Dial Before You Dig (DBYD) Mechanical vehicle protection on storage tanks (height restrictions, bollards) Detectable marker tape over all mains Spare repair fittings kept on site As recycled water is supplied for up to 60% of home water demand, the consequence is already mitigated Isolation valves on reticulation to allow isolation of sections 	Low
DD 1.3 DD 1.4	Drinking Water Distribution	Recycled water cross connection	Very High	<ul style="list-style-type: none"> Recycled water kept at lower pressure than drinking water thereby mitigating recycled water entering the system Colour coded, different materials, labelled pipes and marker tape QA inspections of house plumbing by NSW Office of Trading prior to handover / operation Plumbing inspections triggered by DA process OFT inspection and Flow's cross-connection plumbing check pre-conditions to Flow's connection of sewerage QA checks on reticulation installation prior to handover to Flow (and Flow's issue of Certificate of Compliance) Home builder education (website, Builders Guide) Customer education (website, home owners guide, including translated services) Backflow prevention at each house connection Telemetry monitoring of drinking and recycled water usage to identify anomalous use 	Low
DD 1.5	Drinking Water Distribution	Loss of supply / pressure	High	<ul style="list-style-type: none"> Pump provide in duty / standby Supply recycled water to non-potable use (reduced impact on potable use) Tankered / bottled water Continuous pressure monitoring 	Low
DD 1.6 DD 1.7	Drinking Water Distribution	Chemical leaching into supply	Very High	<ul style="list-style-type: none"> New system, new materials, PVC pipework Pipework designed to Australian Standards AS4020:2005 Commissioning testing Asset management and 6 monthly maintenance inspections Accredited laboratory water quality testing by Flow Systems (grab samples and upon incident notification) 	Low

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Drinking Water Quality Plan (DWQP)



Document Issue Record

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8/09/15	4	Amended to include interim drinking water supply system	Flow	Kirsten Evans	Andrew Horton
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31/08/17	6	Removed Public Health (General) Regulation 2002 (NSW) reference and updated Flow logos	Flow	Laura Dixon	Andrew Horton
22/01/18	7	Annual review	Flow	Laura Dixon	Andrew Horton
3/07/18	8	BMS document map updated	Flow	Michael Northcott	Andrew Horton
10/09/18	9	Updated cover page	Flow	Kirsten Evans	Andrew Horton

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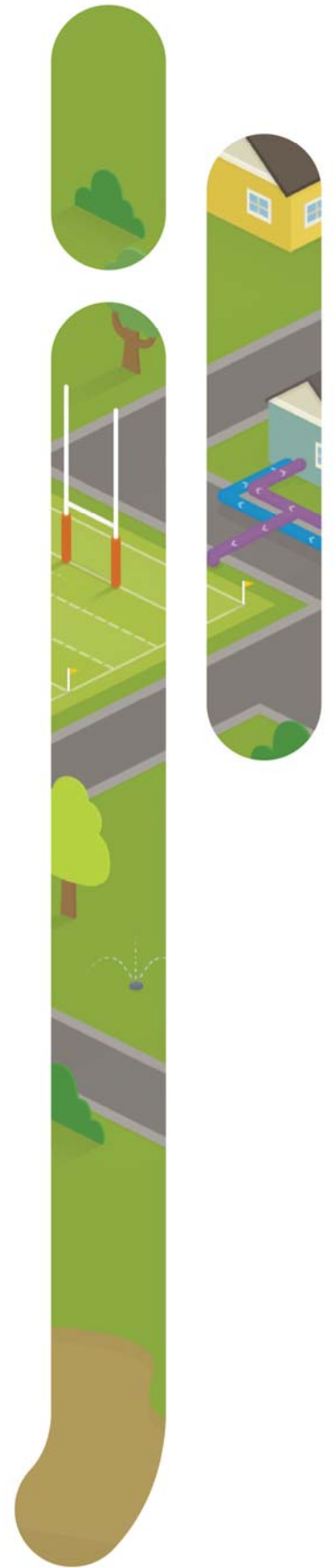
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Central Park Scheme Management Plan (Scheme MP)

CentralPark  Water



Document Issue Record

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0.1	15/01/2015	First draft	Marcelo Sales	
0.2	19/02/2015	Second draft	Kirsten Evans	
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1	01/12/2015	General review and added OEMP section	Kirsten Evans	Darren Wharton
2	1/08/2016	Amended figures and added detail to section 10.2	Laura Dixon	Andrew Horton
3	8/08/2016	Reviewed following feedback from audit	Laura Dixon	Andrew Horton
4	18/05/2017	Updated section 6.1.3.1	Laura Dixon	Andrew Horton

1 Executive Summary

1.1 Purpose of the Scheme Management Plan

This document is the Central Park scheme-specific Scheme Management Plan (Scheme MP) which outlines the scheme-specific details referenced by the Flow Recycled Water Quality Plan, Drinking Water Quality Plan, Sewage Management Plan and others. It therefore forms part of Flow's conformance to the requirements of the Water Industry Competition Regulations 2008 (WICR) Schedule 1 clauses 7, 13 and 14 and forms part of Flow's:

- Commitment to compliance with the Water Industry Competition Act 2006 (WICA)
- Overall management plan framework for the provision of sewage, drinking and recycled water services.

The purpose of this document is to supplement the following Flow management plans with scheme specific information:

- Recycled Water Quality Plan
- Drinking Water Quality Plan
- Sewage Management Plan
- Infrastructure Operating Plan
- Asset Management Plan
- Incident Management Plan
- Operations Environmental Management Plan

1.2 Scheme Summary

Table 1: Scheme Summary Details

Scheme Summary Details		
Location:	Region	State
Chippendale	Sydney	NSW
Ultimate Residential	Ultimate size	
2000		
Development Type:	Development Precinct	Development Marketing Name
Urban Renewal	Central Park	Central Park
Utility Name	Network Operator	Retailer
Central Park Water	Central Park Water P/L	Flow Systems P/L
WICA NOL No.	WICA RSL No.	
12_022	13_001R	
Services	<input checked="" type="checkbox"/> Drinking water <input checked="" type="checkbox"/> Sewage services <input checked="" type="checkbox"/> Recycled water <input type="checkbox"/> Electricity <input type="checkbox"/> Hot water <input type="checkbox"/> Gas	
Recycled water		
Source	Sewage from residential dwellings and retail connections	

Treatment	Screening, Membrane Bioreactor MBR, UV Disinfection, Chlorination
Further Treatment	Chemical storage and dosing, Trade Waste discharge, Odour Scrubbing, Reverse Osmosis
End Uses	Cooling tower, toilet flushing, washing machines, general purpose washdown, carwash use, irrigation, treatment plant service water

Drinking Water

Source	Sydney Water Drinking Water Network
Treatment	Treated by Sydney Water
Further treatment	Nil (monitoring only)

1.3 Critical Control Points

Table 2: Process Critical Control Points

Critical Control Point	Treatment Process	Criteria
1	Membrane Bioreactor(MBR)	≥3.2 log removal
2	Ultraviolet (UV) Disinfection	≥1 log removal
3	Chlorination	≥4 log removal

1.4 High Level Program

The high-level program shows the approximate staging of infrastructure development over the life of the Central Park development. Refer to the following documents listed in Section 2.1.4 Supporting Documents:

- Central Park High Level Program.

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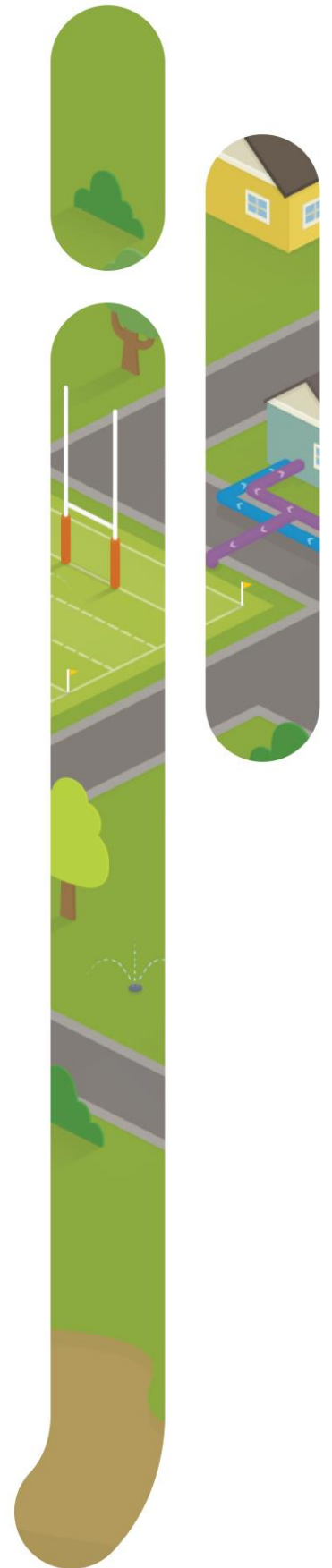
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Infrastructure Operating Plan (IOP)



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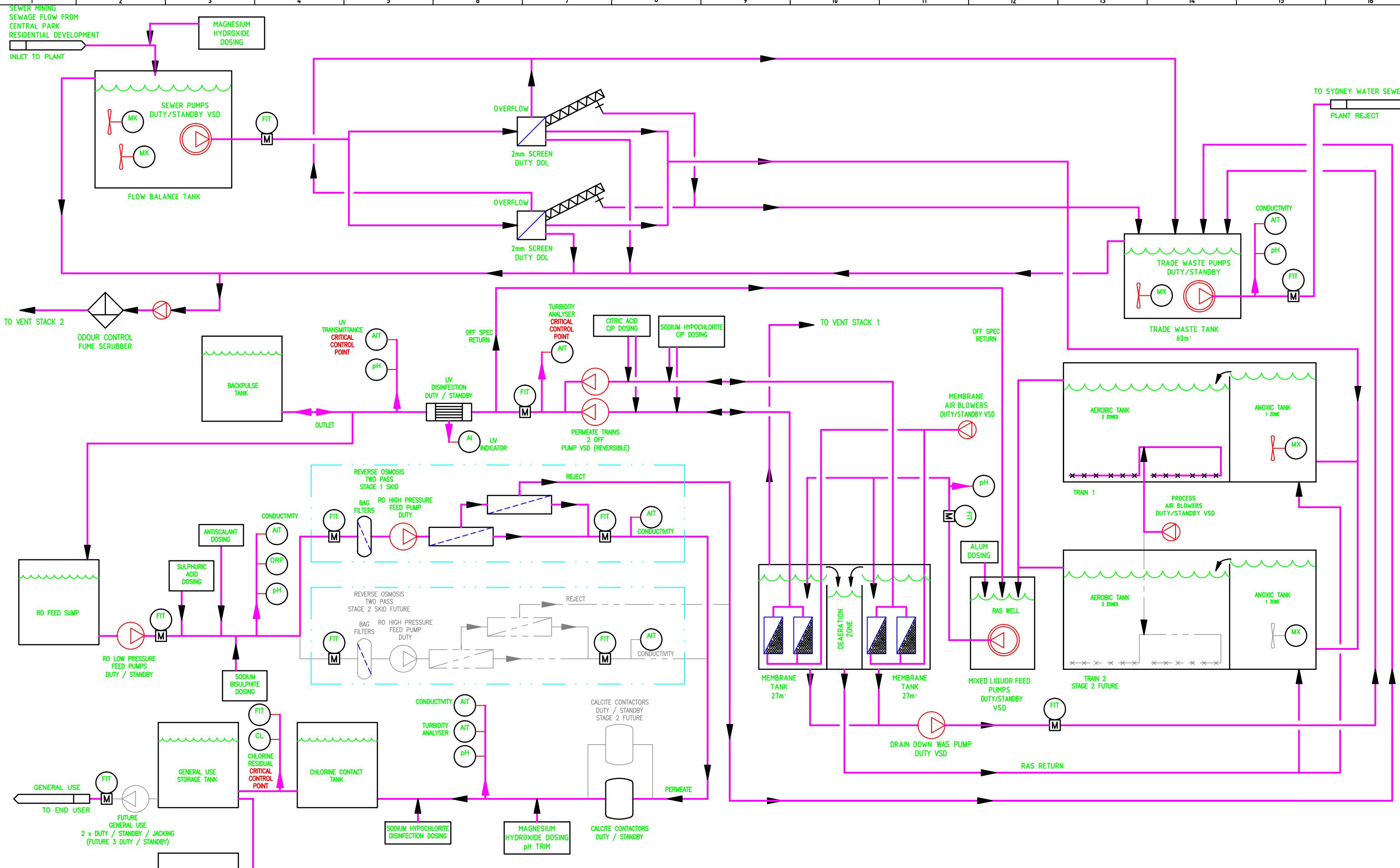
(Public Water Utility) in section 4.1.1.1

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REV	DATE	AMENDMENT REVISIONS	DRAWN	CHECKED	APPROVED
1	22.09.14	AS BUILT	D.B.	A.H.	L.C.
0	27.06.13	ISSUE FOR CONSTRUCTION	J.M.	D.B.	L.C.
D	24.06.13	ADDITIONAL CLIENT COMMENTS ADDED	J.M.	D.B.	L.C.
C	17.06.13	CLIENTS COMMENTS INCORPORATED	J.M.	D.B.	L.C.
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A	31.05.13	ISSUED FOR COMMENT	J.M.	D.B.	L.C.

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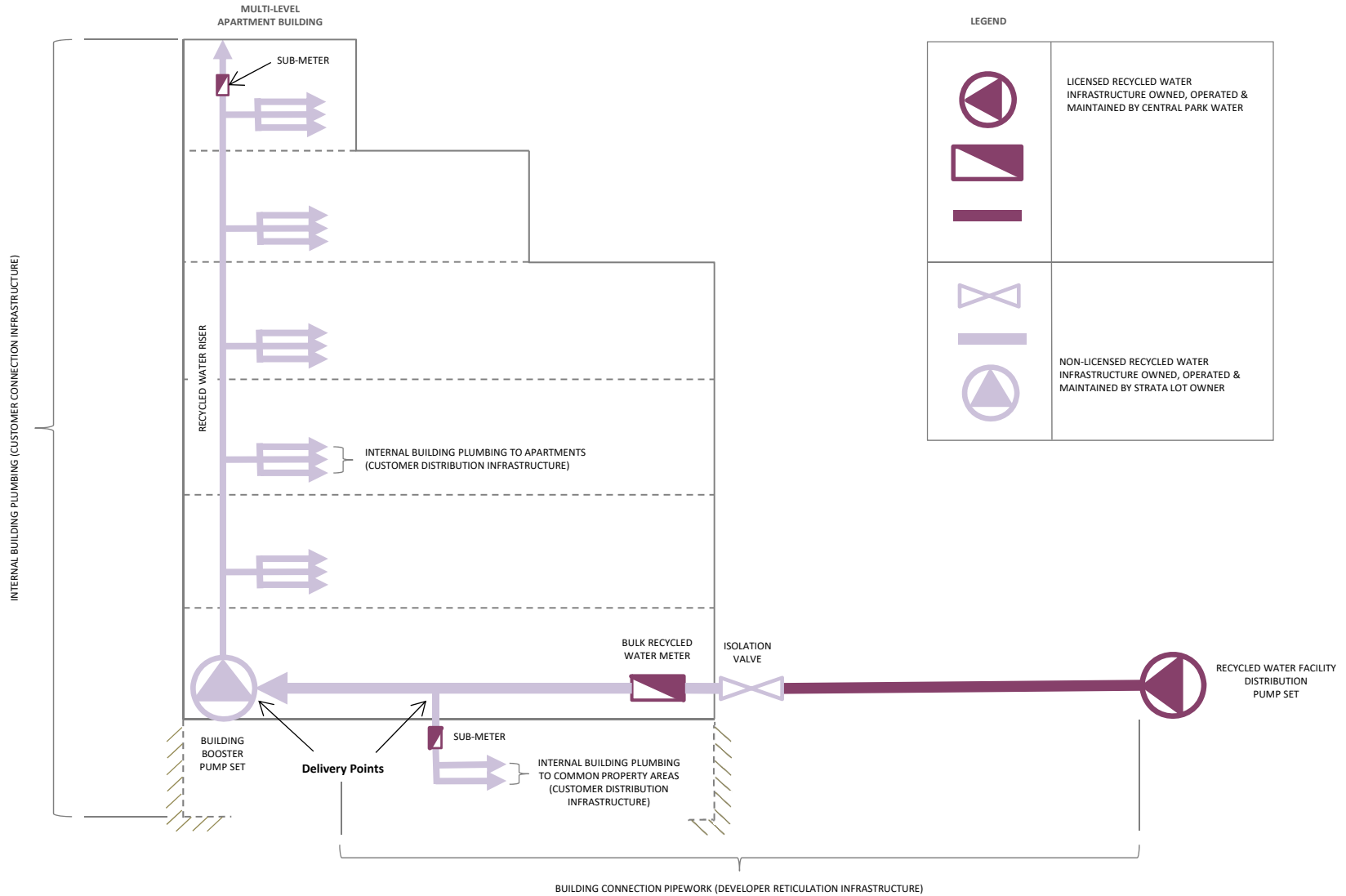
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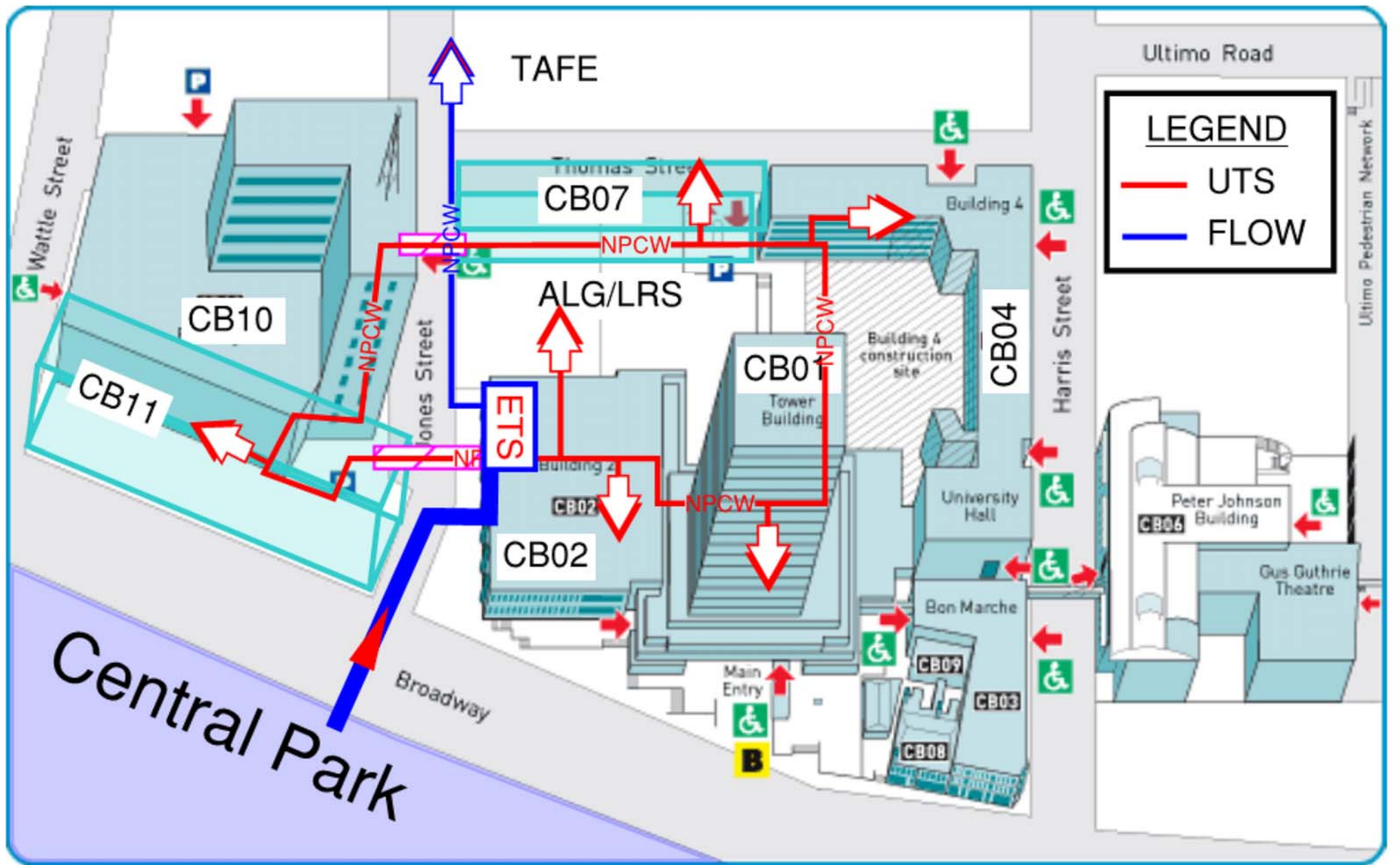
CLIENT: **WATER FACTORY COMPANY** JOB NO: **WT1253**

**CENTRAL PARK RECYCLED WATER PLANT
 DESIGN & CONSTRUCT RECYCLED WATER PLANT
 OVERALL PROCESS
 PROCESS FLOW DIAGRAM**

DESIGNER: DB
 SCALE: N/A
 SHEET: A1
 PROJECT: **WT1253 P010**
 REVISION: 1

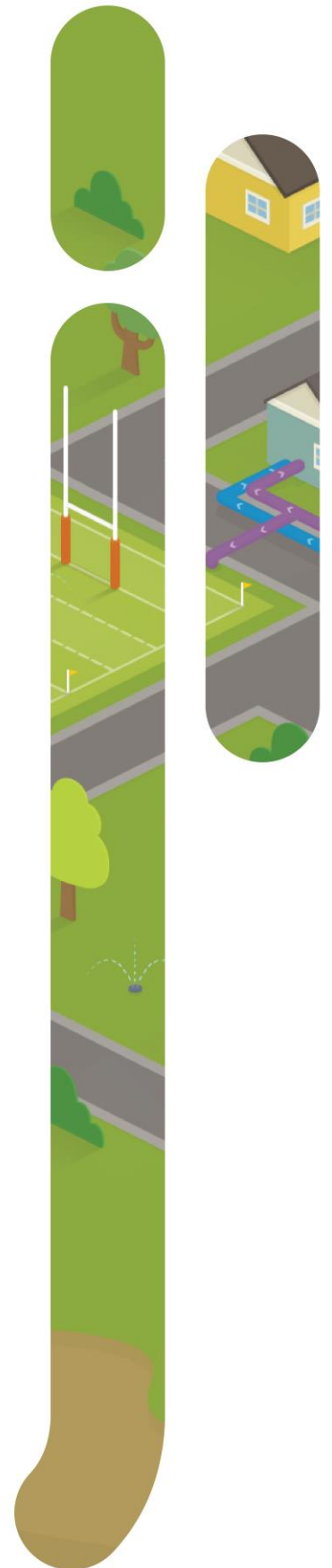
RECYCLED WATER INFRASTRUCTURE – TYPICAL OWNERSHIP & O+M RESPONSIBILITY SCHEMATIC – UTS SERVICE





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Recycled Water Quality Plan (RWQP)



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removed the reference to Public Health (General) Regulation 2002 (NSW)

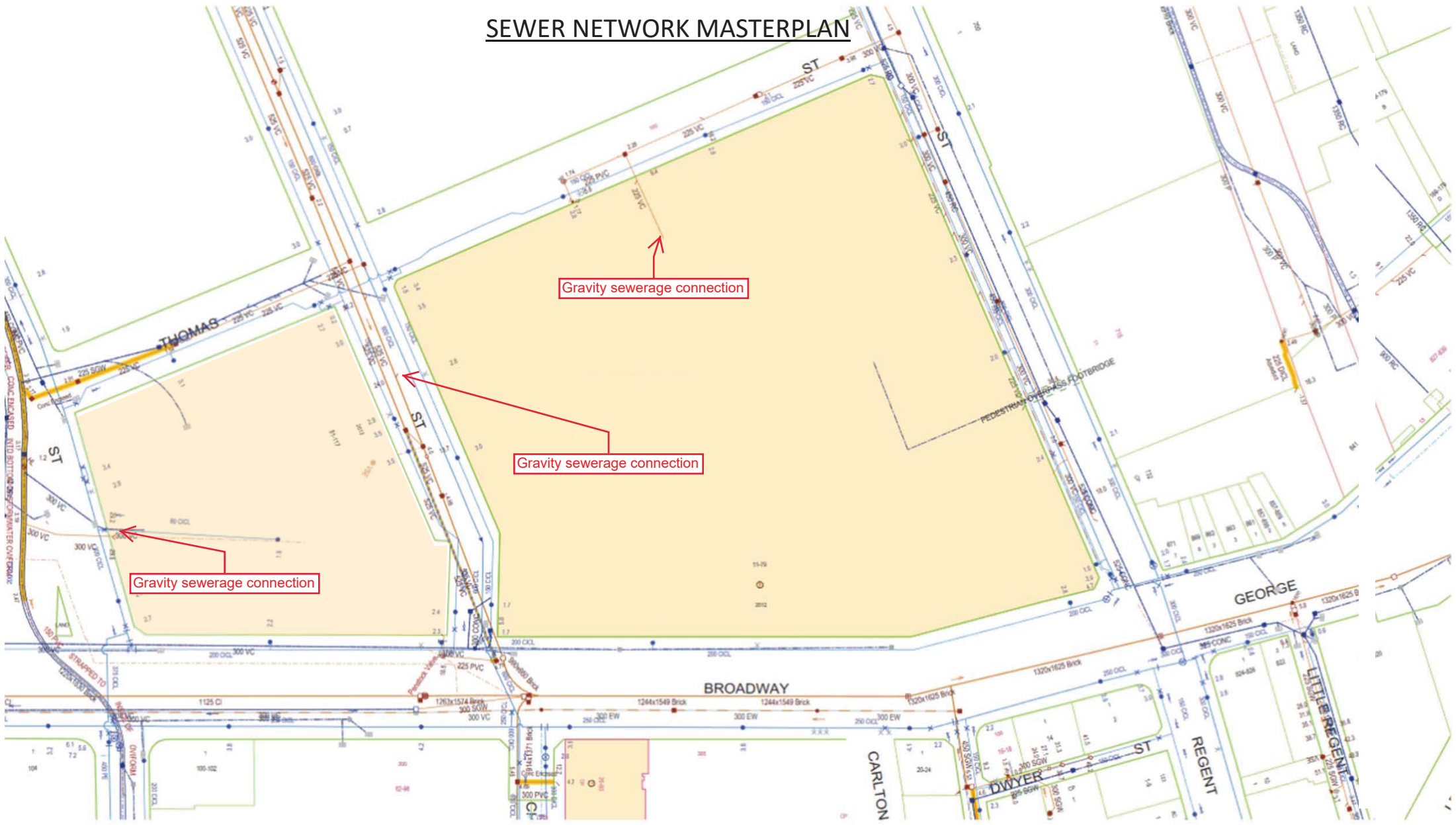
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SEWER NETWORK MASTERPLAN

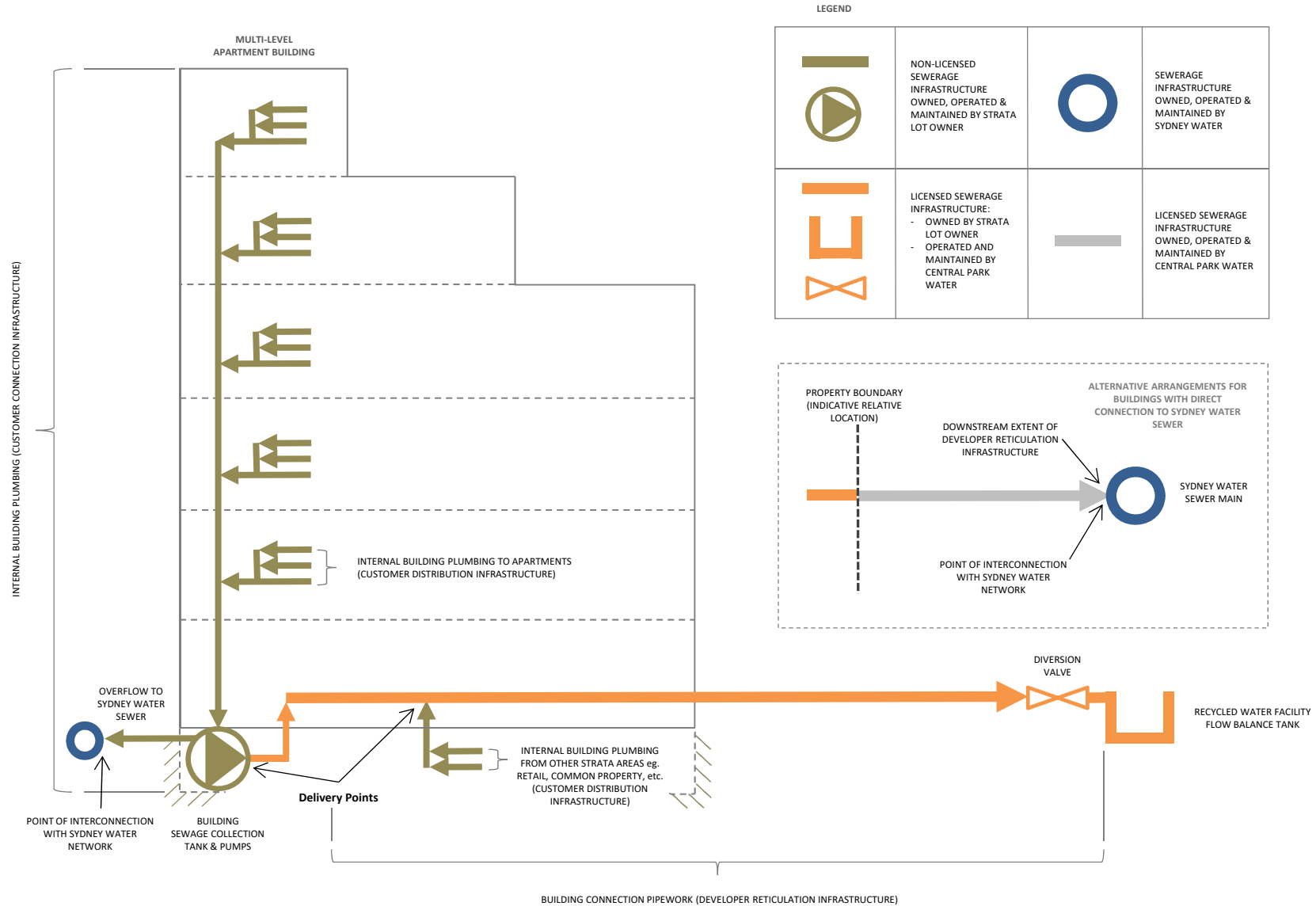


Gravity sewerage connection

Gravity sewerage connection

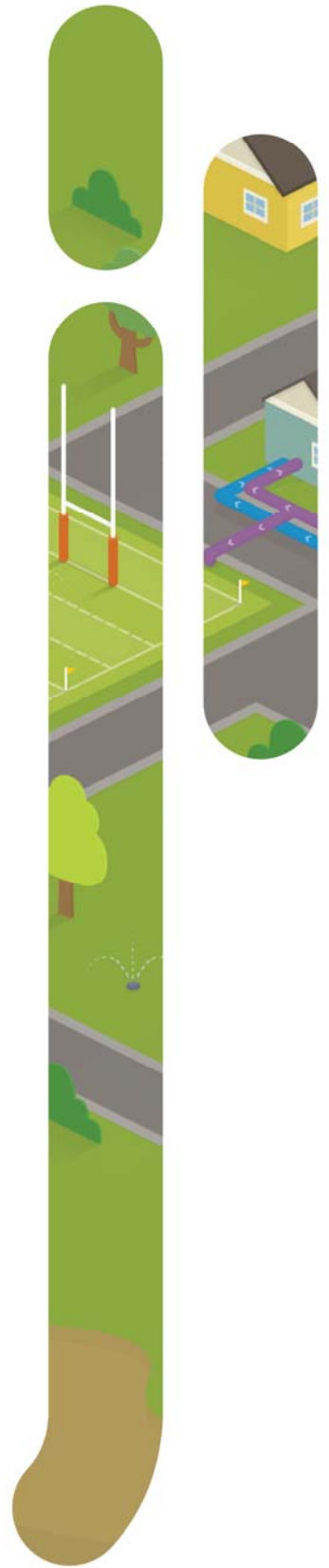
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SEWERAGE INFRASTRUCTURE – TYPICAL OWNERSHIP & O+M RESPONSIBILITY SCHEMATIC



flow

Sewage
Management
Plan



Document Issue Record

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2	30/1/15	Added AMP to Table 1	Kirsten Evans	Andrew Horton
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