Griffith Base Hospital Redevelopment

Utilities Services Report (SSDA)– Hydraulic and Fire Protection Services

Prepared for: CBRE Project Management & Health Infrastructure NSW

Date: 25th March 2021

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Revision

Revision	Date	Comment	Prepared By	Approved By
1	09/11/2020	Issued for Client Review	ADK/GBH	ADK/GBH
2	07/12/2020	Final Issue	ADK/GBH	ADK/GBH
3	17/12/2020	Final Issue (HI Comments Incorporated)	ADK/GBH	ADK/GBH
4	18/12/2020	Final Issue (HI Comments Incorporated)	ADK/GBH	ADK/GBH
5	21/12/2020	Final Issue (HI Comments Incorporated)	ADK/GBH	ADK/GBH
6	25/03/2021	Final Issue (HI Comments Incorporated)	DNL/GBH	DNL/GBH

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1. Introduction

Stantec have been engaged by CBRE Project Management on behalf of Health Infrastructure NSW to prepare a Utilities Services Report, relating to Hydraulics and Fire Protection services for the Redevelopment of the Griffith Base Hospital, 5-39 Animoo Avenue, Griffith NSW, which includes the following scope of works:

- Demolition of Building 25
- Construction of new Clinical Services Building
- Construction of new Western Carpark
- Demolition of Buildings 1, 2, 6, 15, 16, 17, 19, 20, 22, 28, 29, 31 and 35
- Landscaping Work
- Construction of new Main Carpark
- Demolition of Temporary Carpark

Figure 1: Aerial View of the Site

This utilities services report has been prepared in response to SSD-9838218 SEARS 15. Utilities. The report aims to address the utility services infrastructure plan only, based on the following planning conditions:

- Assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site.

- Identify any infrastructure upgrades required off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained.
- Provide infrastructure delivery and staging plan, including a description of how infrastructure requirements would be coordinated, funded, and delivered to facilitate the development.

2. Hydraulic Services Utility Connections

2.1 Water Connection

Griffith City Council is the Local Supply Authority for the site. The site is supplied by a Cold-Water Ring Main which has been formed in the early stages of the project. The ring main has one 100mm metered connection to Warrambol Street, near St Vincent's Private Hospital and a Ø150 metered connection to Noorebar Avenue. This existing connection will remain, and the water meter will be renewed and upgraded complete with Backflow Prevention Assembly. Application will be made to council for the water meter upgrade.

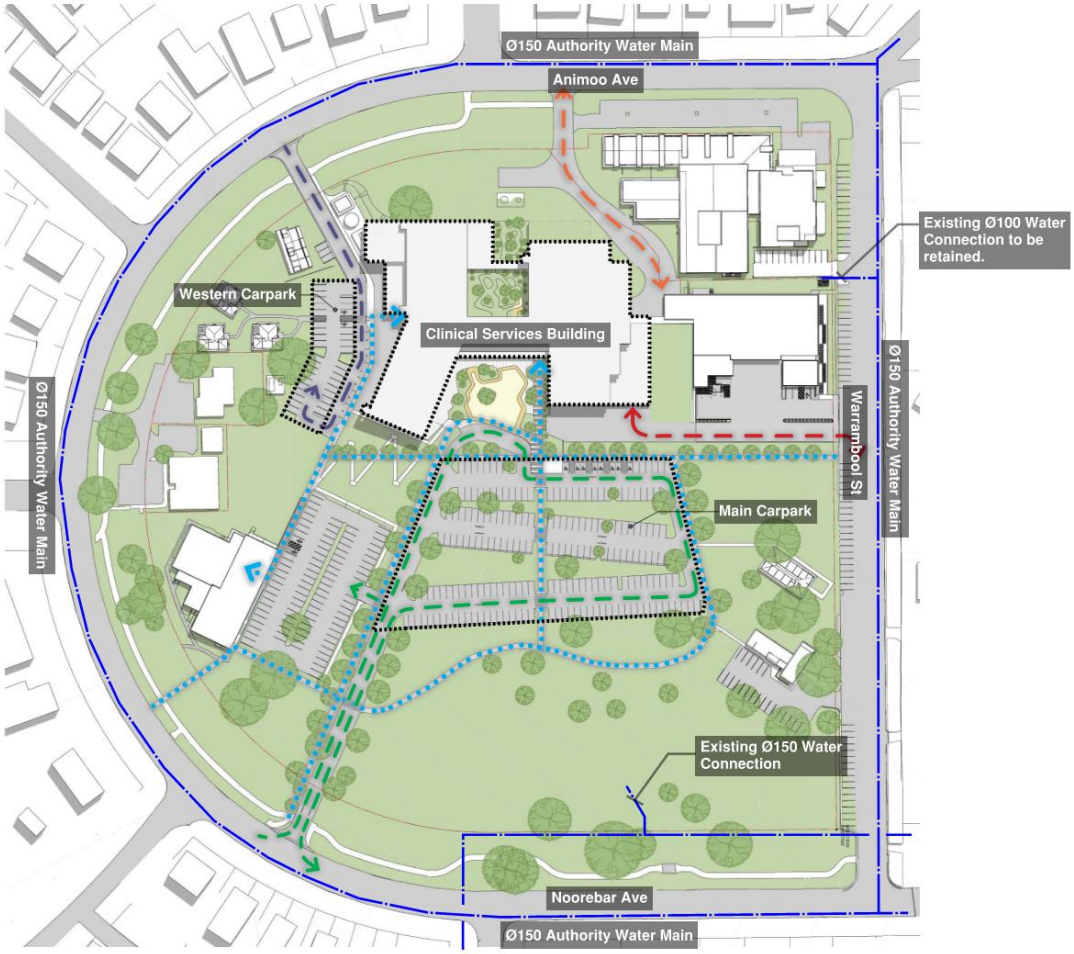

Figure 2: Water Supply Connection Locations

2.2 Sewer Connection

Griffith City Council is the Local Sewer Authority. There are two council sewer mains which are located around the site. One main is located at the top of the site and drains along Animoo Avenue until Kooringal Avenue. Council has advised that this sewer main is connected to the G3 catchment. The G3 catchment is understood to have very limited capacity.

The other sewer main is located to the south of the site on Noorebar Avenue. This sewer main is connected the council G1 catchment and is understood to have more capacity and is council's preferred connection point for sewer discharges for the site. Both sewer mains pipe size is 150mm.

Stantec have estimated the future loading on both Council Catchments, as per the new Design: catchment G3 is expected to receive 20kL/day less discharge, whilst Catchment G1 will receive 16kL/day more. It is noted that, overall, the Site will discharge 4kL/day less than at present. Refer to Section 4 for more details.

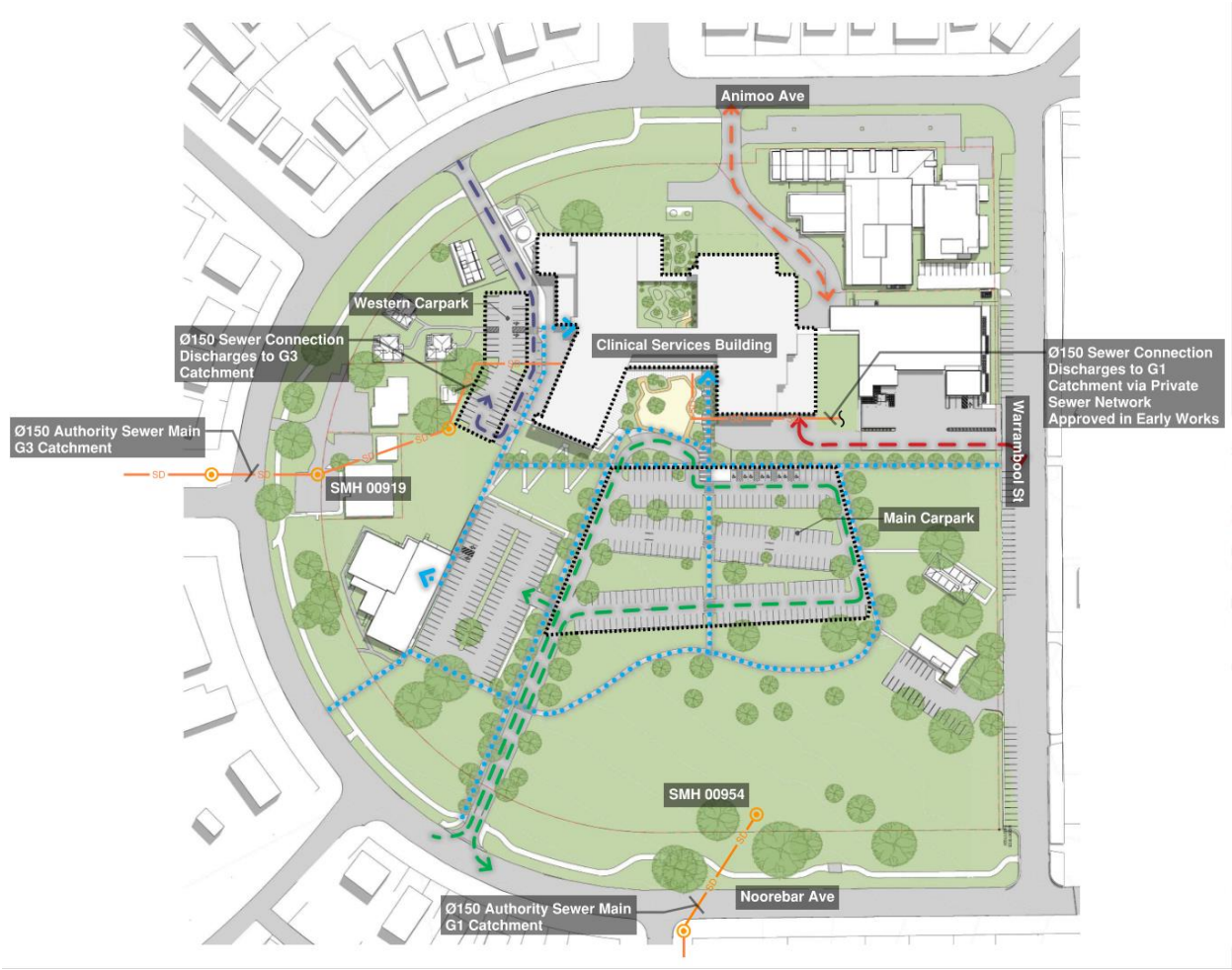

Figure 3: Sewer Connection Locations

2.3 Gas Connection

Jemena is the Local Supply Gas Authority for the site. The site is supplied by a 35kPa gas service in Warrambool Street. A gas meter will be located on the line to the to the Non-Clinical Services building and the Clinical Services Building, respectively. Both lines will need to be regulated prior to use at the building connection. The natural gas will supply the Domestic Hot Water Plant, and Mechanical Plants for the Clinical Services Building.

Stantec have discussed the Griffith Base Hospital redevelopment project with the State Network Development Manager from Jemena. No major concerns were raised due the negligible increase in gas load for the main works. Jemena advised the application for amendment to the existing gas agreement will be lodged with and dealt by Health Infrastructure's Gas Retailer which is believed to be Origin Energy.

Figure 4: Gas Connection Location

3. Fire Services Utility Connections

3.1 Fire Services Overview

The strategy for fire protection services is to combine the site hydrant and sprinkler distribution mains in order that a common tank and pump infrastructure facility will serve both services.

The combined hydrant and sprinkler infrastructure will take connection from the local town main and provide a tank infill service. The town main has sufficient flow capability to supply the Hospitals hydrant service demand but will not be able to supply simultaneously operating sprinklers.

A single 80m3 tank will provide the additional water required to allow operation of both the hydrant and sprinklers systems simultaneously.

A dual fire pump arranged in a duty /standby operational configuration will supply water to all hydrant and sprinklers systems on the Hospital site.

A new Brigade Booster Facility will be provided that will allow the Brigade to draw from the water storage tank and/or the town main water supply at their discretion.

Fire systems water supplies will be reticulated in a ring main system. The service will be internal through the new Hospital development and extend underground to interconnect with existing inground Hydrant pipes, to provide continuing service for existing buildings and those buildings that are to be retained.

Staging of the ring main construction process will be coordinated to meet the requirements of the Hospital through the various development phases.

Hydrant landing valve outlets will be installed to provide coverage to all areas that require protection per the requirements of the BCA. Where located internally, single landing valve swill be installed. Dual head hydrants will be installed in external locations.

Sprinklers will be provided throughout the new multistorey Clinical Services Building and the adjacent Non Clinical Services building

3.2 Fire Hydrant System Connection

The existing hydrant system is extended from the town main water supply in Noorebar Avenue.

There are no existing water storage tanks or pumps associated with the existing hydrant system.

Interconnection with the town main is via a single 100NB steel pipe that incorporates a Double Detector Check Valve arrangement. There is currently no facility to allow the Fire Brigade to draw water from the town main water supply and boost flows and pressures within the hydrant system.

From the Double Detector Check Valve point water is reticulated to external hydrant standpipes. Some standpipes have single outlet points and others are double head type. In some cases, the standpipes are located within 10m of a building thereby rendering them non-compliant.

Survey information does not clearly describe the route of inground pipe however the approximate locations and pipe routes have been deduced and are indicated on design drawings. Hydrant pipework does not extend to cover to the North side of the Hospital and is arranged in a dead-end leg arrangement.

The existing system was extended in 2018 to provide coverage for the temporary Renal Unit and the Ambulatory Care Hub. Provision for further extension of the main was incorporated at that time.

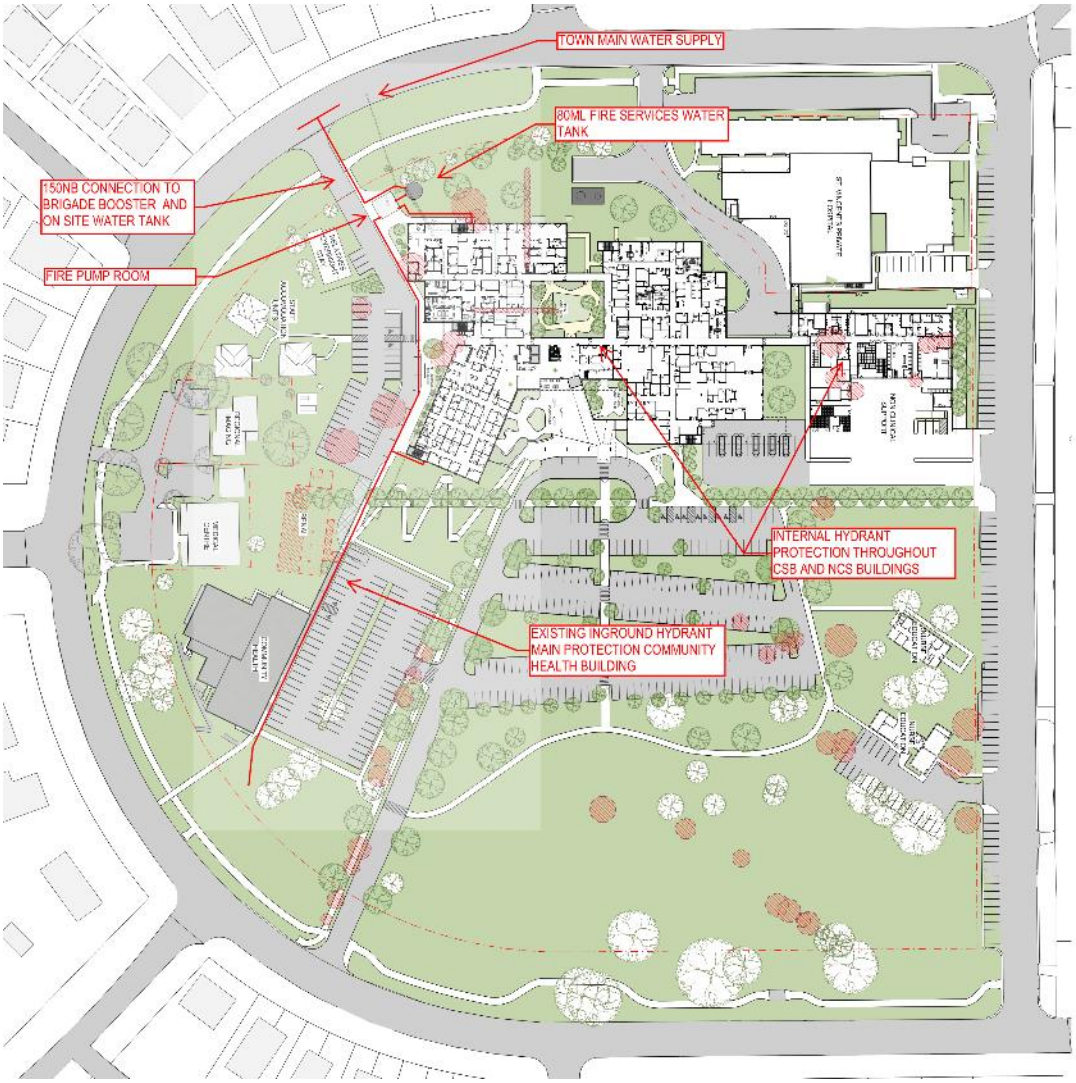

Figure 5: Fire Hydrant System Connection Location

3.3 Fire Sprinkler System Connection

There are currently no fire sprinkler systems on site.

Compliance with the NCC BCA and Health Infrastructure Guidelines requires installation of sprinklers system, throughout the NCS and the CSB buildings.

Installation of both the new hydrant system and the sprinkler system will be completed in accordance with the requirements for Combined Hydrant Sprinkler systems as defined in AS2118.6:2012.

Refer to the Fire Services Overview section above for an overview of the Combined Hydrant Sprinkler system infrastructure.

4. Hydraulic Services Demand Calculations

4.1 Water Demand Calculations

Comparative water usage is estimated between the existing Griffith Base Hospital (baseline 2017), and at the redevelopment project completion. Due to the construction age of the existing Griffith Base Hospital and the advancement of water efficient and low-flow tapware that will be installed throughout the redevelopment we anticipate there will be a negligible increase in water usage.

Average daily water demand has been calculated by using an estimated water usage per hospital bed.

It is expected that the Redevelopment Water Demand will total 186kL/day, up from the 178kL/day used at present (4% increase on existing)

The additional peak flows have also been calculated for the development:

- Mechanical Cooling Towers = 4L/s
- Fire Hydrants = 25L/s
- Fire Sprinklers = N/A

4.2 Sewer Demand Calculations

Comparative sewer demand is estimated between the existing Griffith Base Hospital (baseline 2017), and at the redevelopment project completion. As mentioned in section 4.1 above, due to the construction age of the existing Griffith Base Hospital and the advancement of water efficient and low-flow tapware that will be installed throughout the redevelopment we anticipate there will be a negligible increase in sewer demand.

Average daily sewer demand has been calculated by using the estimated water usage per hospital bed and assuming 80% of this load.

It is expected that the Redevelopment Sewer Discharge will total 138kL/day, down from the 142kL/day used at present (3% decrease on existing)

4.3 Water and Sewer Demands Breakdown

Below, a breakdown of the site-wide Baseline (2017) and after Completion (2027) demands, as per the WSAA Code procedures.

Table 3 shows the Net Changes expected from the Site:

- Water Demand: 8kL/day increased demand
- Sewer Discharge: 4kL/day decreased discharge

	kL/day Demand/Load 2017			kL/day Demand/Load 2027		
	Water	Sewer	Catchment	Water	Sewer	Catchment
Surgical	17	13.6	G3	0	0	G3
Medical	21	16.8	G1	0	0	G3
Medical and Surgical Overnight	0	0	G3	37	29.6	G3
Medical and Surgical Day only	12	9.6	G3	7	5.6	G3
Obstetrics	13	10.4	G1	9	7.2	G3
Special Care Nursery	4	3.2	G1	3	2.4	G1
Nursery Cots	0	0	G3	0	0	G1
Paediatrics	10	8	G3	8	6.4	G3
Paediatrics - Day Only	4	3.2	G3	5	4	G3
Critical Care Unit	6	4.8	G3	6	4.8	G1
Hospital in the Home	10	8	G3	8	6.4	G1
Aged Care and Rehabilitation unit	4	3.2	G3	15	12	G1

	2017			2027		
	Water	Sewer	Catchment	Water	Sewer	Catchment
Emergency Resuscitation Bays	2	1.6	G3	2	1.6	G1
Emergency Treatment Bays	8	6.4	G3	8	6.4	G1
Emergency Short Stay Unit	0	0	G3	3	2.4	G1
Emergency safe room	1	0.8	G3	1	0.8	G1

Table 1: Inpatient and Emergency Services Comparison

	2017			2027		
	Water	Sewer	Catchment	Water	Sewer	Catchment
Emergency Procedure rooms	1	0.8	G3	1	0.8	G1
Emergency Primary Health Consult rooms	2	1.6	G3	2	1.6	G1
Sexual Assault room	0	0	G3	1	0.8	G1
Renal Chairs	3	2.4	G3	5	4	G1
Chemotherapy Chairs	2	1.6	G3	4	3.2	G3
Dental Chairs	2	1.6	G1	3	2.4	G3
Community Health	7	5.6	G3	15	12	G3
Ambulatory Care therapy room	2	1.6	G3	2	1.6	G3
Ambulatory Care procedure Room	0	0	G3	1	0.8	G3

	2017			2027		
	Water	Sewer	Catchment	Water	Sewer	Catchment
Operating Theatres	1	0.8	G3	1	0.8	G1
Procedure Room	0	0	G3	1	0.8	G1
Recovery	3	2.4	G3	3	2.4	G1
Birthing room	1	0.8	G3	1	0.8	G3
Assessment Room	1	0.8	G3	1	0.8	G3

	2017			2027		
	Water	Sewer	Catchment	Water	Sewer	Catchment
Staff accomoodation	36	28.8	G3	29	23.2	G3
Relative accomodation	4	3.2	G3	3	2.4	G3
Education and Training	1	0.8	G3	1	0.8	G3

Table 2: Outpatient and Non Clinical Services Comparison

2017 Sewer Totals kL/day		
kL/day	G1	G3
	32	110.4

2027 Sewer Totals kL/day			
kL/day	G1	G3	Hold for Irrigation
	48	100.8	-10

Net Change Sewer Discharge			
kL/day	G1	G3	Site
	16	-19.6	-3.6

Catchment G3 receives 20kL/day LESS than before
Catchment G1 receives 16kL/day MORE than before
Site discharges 4kL/day LESS than before overall

Water Demands			
kL/day	2017	2027	Net Change
	178	186	8

Table 3: Sewer Catchment and Water Demand Comparison

4.4 Gas Demand Calculations

Gas demand has been calculated based on the estimated daily usage of the gas appliances nominated below.

Appliance	Total (MJ/hr)	Total (MJ/Daily)	Total (MJ/Year
Domestic Hot Water	820	9,840	3,591,600
Mechanical Plant	1,000	12,000	4,380,000
Peak MJ/hr			**1,820**

The above nominated demand for the redevelopment is considered low and it is anticipated to have minimal impact on the utility services infrastructure.

5. Fire Services Demand Calculations

5.1 Fire Hydrant Demand Calculations

The town main water supply must be capable of providing a minimum flow of 25lps at a residual pressure of not less than 275kPa. Pressure and flow tests results received from Griffith City Council indicate this performance is provided by the existing town main supply.

5.2 Fire Sprinkler Demand Calculations

Not applicable

6. Utility Services Upgrades

The hydraulic and fire protection services usage demands for the Griffith Base Hospital Redevelopment will not require any utility or infrastructure upgrades offsite due to the minimal increase in demand comparatively between the existing hospitals current baseline, and the project completion as calculated in sections 4 & 5 above.

7. Water Usage Reduction

7.1 Low Flow Tapware

Potable water usage will be reduced where deemed appropriate by the use of WELS rated low-flow tapware and sanitary fixtures, typically using the following flow rates;

- Showers = 9.0L/min
- Basin 6L/min
- Sink 7.5L/min

Low-flow tapware are only to be used if the fixtures are chosen to comply with the Australian Health Facility Guidelines.

7.2 Water Metering

The redevelopment will be metered with utility owned water meters and client owned and read water sub-meters. The water sub-meters will be provided with connection to the BMS via a pulse output, in which water usage and leak detection can be monitored.

7.3 Reverse Osmosis Reject Water Re-Use

10,000L/day of reverse osmosis reject water will be available through the RO plant process and this water has been deemed suitable for re-use within the redevelopment's irrigation system. It is anticipated that the 10,000L of reject water that is made available daily can be used to irrigate upwards of 5000m² of landscape area and lawns, which will reduce the potable water demand and also limit the impact on the sewer infrastructure.

Design with
community in mind

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