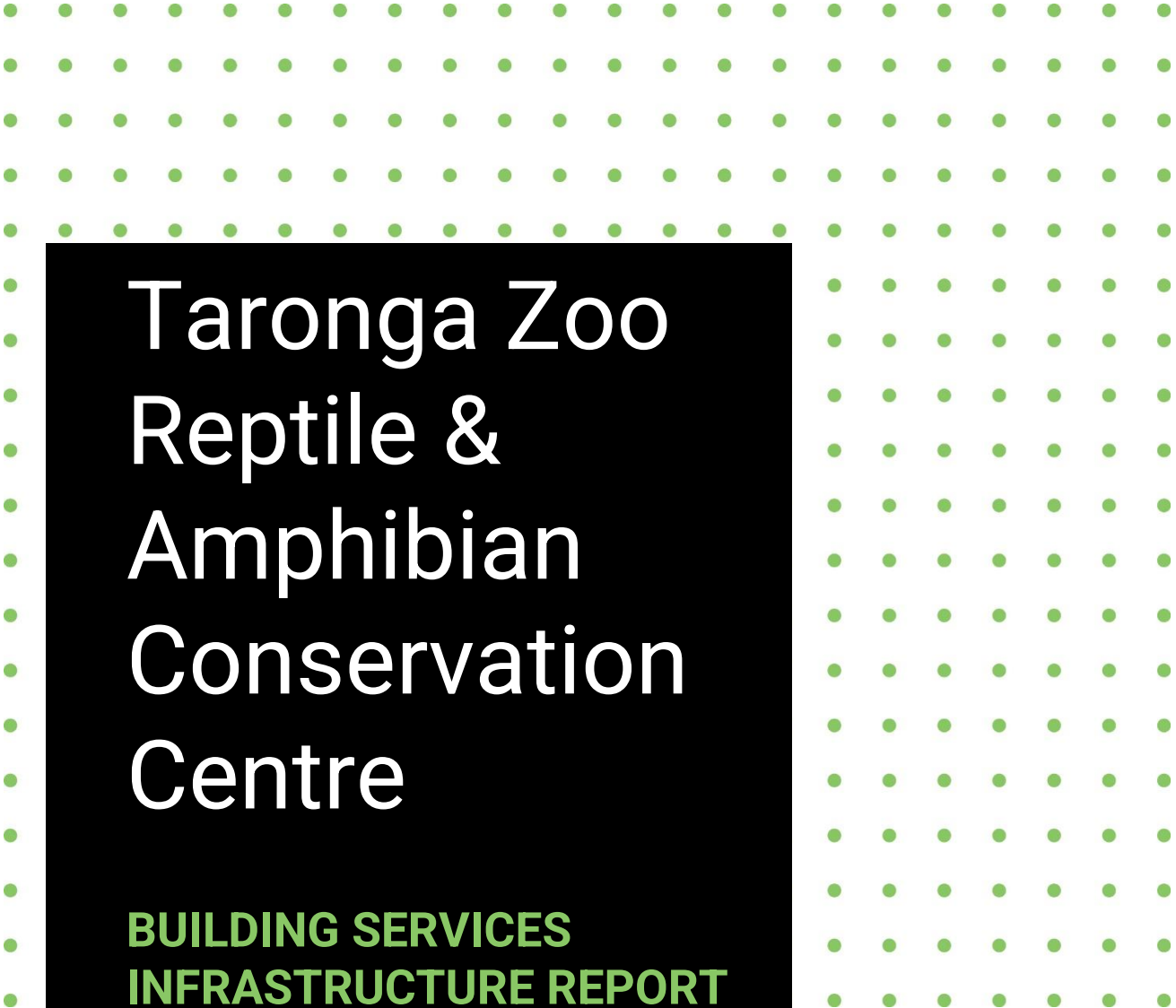


A decorative background element consisting of a grid of small green dots. The dots are arranged in a pattern that is partially obscured by a black rectangular box containing the main title. The dots are visible on the left and right sides of the box, as well as above and below it.

Taronga Zoo Reptile & Amphibian Conservation Centre

BUILDING SERVICES INFRASTRUCTURE REPORT

Client:
Taronga Conservation Society Australia

Document No.
TZ-RACC Building Services Infrastructure
Report

REPORT INFORMATION

Project	Taronga Zoo Reptile & Amphibian Conservation Centre
Title	Building Services Infrastructure Report
Client	Taronga Conservation Society Australia
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1 Introduction

1.1 Brief

LCI Consultants have been engaged to undertake the design of electrical, mechanical, fire, and hydraulic services for the new Reptile and Amphibian Conservation Centre planned for the Taronga site, and to prepare an “Services Statement” for the Development Application. This document has been prepared to describe the infrastructure requirements of the building services. This report should be read in conjunction with the Concept Design Report. This document has been based on CNF & Associates previous Infrastructure report and considers how the new facility is connected to the existing site services based on the updated architectural design.

The review is based on existing inground services infrastructure drawings and documents provided by Taronga Zoo, including architectural drawings of the proposed centre.

This report assesses the current services infrastructure and the suitability for this infrastructure to be retained and provides recommendations for further investigations and a proposed connection plan.

The comments in this report are made on the basis of the validity of the information provided and shall not be relied upon as providing any warranty of the services and equipment.

1.2 Reptile & Amphibian Conservation Centre

Taronga is a leader in reptile and amphibian conservation in Australia. The Taronga Conservation team has brought back seven reptile and amphibian species from the brink of extinction.

The development of the new centre will allow Taronga to continue to lead the recovery of species that would otherwise be lost to future generations. It will provide critical breeding space to support zoo-based conservation programs to ensure important species, such as Corroboree Frogs, are protected for decades to come.

The proposed centre will provide a new modern experience for guests to engage with reptiles and amphibians which will be designed with the latest best-practice standards for animal care and welfare. It will be an educational and multi-layered experience for guests that showcases the beauty and diversity of some of the most misunderstood and most imperilled creatures on the planet under threat, from climate change, disease, and habitat modification.

The new Reptile and Amphibian Conservation Centre (RACC) will be built on the existing Taronga site, occupying approximately 1,700 square metres of land currently occupied by the lemur enclosure and adjacent unused areas. The facility will need the following services:

- Electricity Supply
- Water Supply
- Sewer/Drain Connection
- Fire Services

The facility will be served with its own Heating, Ventilation and Air Conditioning (HVAC) systems. The HVAC systems will provide ventilation for the Plant Room and other Back of House areas and air conditioning for staff areas in the Back of House as well as all animal exhibit areas/rooms.

2 Services Required

2.1 Electrical Services

The RACC facility will be supplied with electrical power from the existing Taronga power distribution system's substation 7, located to the north west of the proposed facility. The estimated load (maximum demand) is approximately 589 Amps per phase, which can be provided via a new submains feeder cables installed in a single underground conduits. It is proposed that a 630Amp rated service will supply the facility. Upstream infrastructure alterations will include an electrical generator back-up, that will include some capacity for critical life services within the new RACC.

The approximate load group breakdown is as follows:

No.	Equipment/Devices	Rating (kW)
1	Water Treatment Plant	15
2	Humidification	40
3	HVAC System	75
4	Exhibit General Lighting & GPOs	77
5	General Lighting & GPOs	65
Total		272

2.2 Mechanical Services

The animal exhibit rooms have a wide range of temperature and humidity requirements which differ significantly from the personnel areas of the BOH areas which are air conditioned.

The design is based on four 100% outdoor air chilled water air handling installed in the plant room and ducted to the required areas. Each of the animal exhibits shall be provided with dedicated cooling and heating coils, VAV terminal units and humidifiers. Dedicated fan coil units shall be provided to high load exhibits and dedicated back of house and front of house areas.

Additionally, mechanical ventilation, will be provided for all enclosed areas.

2.3 Hydraulic Services

Taken as a whole, the various competing requirements for water systems leads to a determination that three distinct and separate water systems are required. They are:

- Potable Water
- Dechlorinated Water

- Reverse Osmosis Water
- In summary, the requirements for each system are:

No.	System Name	Application
1	Potable Water	Most enclosures with pools and staff amenities
2	Dechlorinated Water	Most Amphibians and pools where fish may be added
3	RO Water	Frogs & tadpoles pools, and misting sprays

The main potable water line feeding the new centre will provide source water for the Dechlorinated Water and RO Water systems to be installed in the plant room. A single 100mm diameter incoming potable water service will provide adequate capacity to the facility.

As normal operations will include regular draining and washdown/hose down of the exhibit pools, a drain manifold will be provided to run adjacent to all exhibit rooms. Each pool/exhibit will be provided with a drain line to connect to the drain manifold via a manually operated valve located adjacent to each pool. Floor drains and pool overflow connections will also be connected to the drain manifold but will not be able to be isolated.

The drain manifold will also collect the drains/discharges from the BOH areas and the backwash water from filters and the RO units. The drain will then discharge to the sewer connection.

2.4 Gas Services

There will be no gas service for the new facility. Heating shall be via heat pumps as a preference or direct electric where higher temperature heating is required.

2.5 Fire Services

The existing fire main will provide fire water to the new facility. Two new fire hose reels and a booster station are proposed to serve the new facility.

3 Existing Infrastructure Identified

3.1 Electrical Services

The existing site distribution network includes two possible substations that would be suitable for the connection to the new facility, namely Substation 4 and Substation 7. Both Substations were reviewed, and Substation 7 has been selected because:

- Indicatively has the required electrical capacity
- There are proposed alterations to the existing electrical infrastructure to that will utilise the spare site capacity, and accommodate a connection to service the new RACC.
- The route from this substation is considered to be easier and simpler to install, where there are potential spare underground conduits for use.

3.2 Mechanical Services

The new facility's HVAC services will operate as a stand-alone system, so no connection to any existing mechanical services is required.

3.3 Hydraulic Services

Potable Water Service

Based on 'Sure Search' utilities survey drawings received and physical onsite inspections, an existing DN.100 PE potable water main has been located within services road way adjacent to the Presentation stage facility.

As per onsite performance testing of the water main, it is envisaged this service has sufficient flow and pressure to cater for the RACC building's water demands.

Sewer Drainage Service

Based on 'Sure Search' utilities survey drawings received and physical onsite inspections, an existing sewer manhole is located within the garden bed adjacent to the Gorilla enclosure.

As per onsite survey investigation works, the sewer manhole incorporates a DN.150mm outlet pipe at a invert level of RL43.000. It is envisaged drainage from RACC building will be able to gravitate and make connection to the sewer man hole and the size of the pit's outlet pipe can accommodate the expected waste water flow rates.

Recycled Water Service

Based on 'Sure Search' utilities survey drawings received and physical onsite inspections, an existing DN.100 PE non-potable water main has been located within services road way directly in front of the proposed RACC building.

As per onsite performance testing of the non-potable water main, it is envisaged this service has sufficient flow and pressure to cater for the RACC building's non-potable water demands.

3.4 Gas Services

Although there is an existing gas service line running approximately 50m to the south of the facility's planned location there is no current plan to use has, so no tie-in to this service is required.

3.5 Fire Services

There is an existing fire booster station adjacent to the facility's planned location, and it is expected that this will provide adequate flow and pressure to fulfil the requirements for the new facility.

Appendices

A.1 Appendix B – Site Services Site Layout

Documentation has been collated separate to this design report; please refer to electronic copy of documentation listed in the table below for Appendix H.

Document	Description
21-084-M-010_A	TARONGA ZOO SERVICES SITE LAYOUT

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