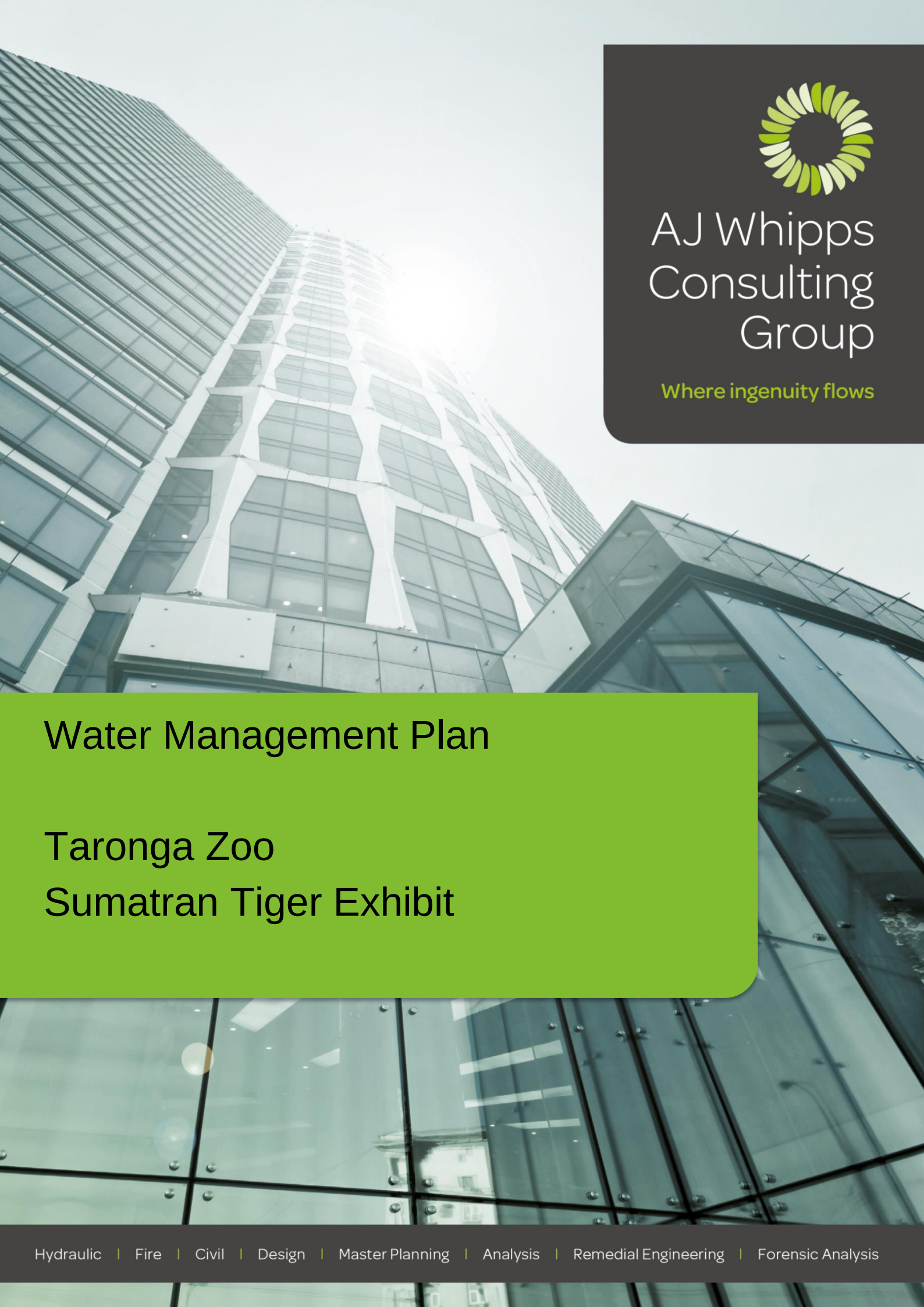

AJ Whipps Consulting Group

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Water Management Plan

Taronga Zoo
Sumatran Tiger Exhibit

Hydraulic | Fire | Civil | Design | Master Planning | Analysis | Remedial Engineering | Forensic Analysis

Water Management Plan
Taronga Zoo – Sumatran Tiger Exhibit
Bradleys Head Road, Mosman NSW 2088

Issue P2

Date 12 May 2015

Job No 20140533

AJ Whipps Consulting Group

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Document History

Revision	Date	Amendments
P1	16/04/15	Preliminary Issue
P2	12/04/15	Preliminary Issue

INDEX

1 INTRODUCTION

1.1 Purpose of Report

This report has been prepared in relation to the proposed refurbishment and partial redevelopment of the Sumatran tiger exhibit at Taronga Zoo. The purpose of this report is to identify and address the following hydraulic and civil related services.

- Proposed servicing strategies For sewer, stormwater, Potable and recycled water
- Main Infrastructure works – related to impacts to the existing potable water, recycled water and fire hydrant infrastructure systems due to proposed infrastructure diversions within the proposed area of development.

1.2 Referenced Documents

This report references to the following documents:

- Taronga Zoo`s HR 10.2 Waste Management Policy v.2.0 April 2011
- Waste Management Plan – Taronga Zoo 2014-2016
- Policy for Stormwater Management - Mosman Council.
- Contamination report prepared by Douglas Partners dated April 2015
- HR 10.2 Waste Management Policy
- Taronga Zoo Waste Management Ops Plan – Site Wide February 2015
- Taronga Waste Management Plan - EFP Feb 2015

1.3 Services Reviewed

Below is a list of services that have been reviewed as part of this assessment;

- Potable water
- Fire Hydrant
- Fire Hose reel
- Sewer drainage (Sanitary drainage)
- Recycled water
- Stormwater drainage
- Trade Waste Drainage

1.4 Limitations

This report has been based on available as constructed documentation drawings provided by Taronga Zoo in addition to a site visit on 2 September 2014.

The existing trade waste agreement with Sydney Water and the RMS approval related to approval; for the discharge of stormwater to Sydney Harbour.

Natural Gas has been deemed not necessary for the project by Zoo.

2 PROPOSED SERVICING STRATEGY

The following summarise the extent of each hydraulic services serving the proposed Sumatran Tiger Exhibit.

2.1 Potable Water

EXISTING SERVICE

The proposed development is:

- Served by a 100mm private site infrastructure which requires diversion to ensure final location of the infrastructure is located outside of animal enclosures
- Is has minimal increased water loading from the previous development based on a fixture loading count

Based on the above noted points augmentation of the existing water infrastructure is not proposed.

PROPOSED SERVICE

It is proposed to reticulate potable water from the existing 100mm main to all fixtures used for ablution and consumption by both humans and animals.

Examples of the fixtures include but are not limited to:

- Showers
- Hand wash basins
- Kitchens
- Drinking fountains
- Hose taps likely to be used for watering animals
- Kitchen appliances

Potable water is to be reticulated from the water main which traverses the main thoroughfare of the Sumatran tiger and surrounding exhibits.

All specified fixture flow rates shall be in line with the minimum recommendations stipulated within the ESD report produced by Surface Design.

Each building will have a control valve to enable localised isolation.

Subject to consultation with the ESD Consultant, a water meter with BMS outputs can be provided for integration into a building management system.

2.2 Fire Hydrant

Based on the draft BCA report prepared by Steve Watson and Partners dated 15 April 2015, coverage from fire hydrants is not required.

2.3 Fire Hose Reel

Based on the draft BCA report prepared by Steve Watson and Partners dated 15 April 2015, coverage from fire hose reels is not required.

2.4 Sewer Drainage

EXISTING SERVICE

The proposed development is:

- Served by a 100mm sanitary drain with an average grade of 4%
- deemed to have a minimal increase in waste water loading from the previous development based on a fixture loading count

Based on the above noted points augmentation is of the existing sanitary infrastructure is not proposed.

PROPOSED SERVICE

It is proposed install a new sanitary drainage system to all sanitary fixtures within the proposed Sumatran Tiger exhibit.

Examples of the fixtures include but are not limited to:

- Showers
- Hand wash basins
- Toilets
- Urinals
- Kitchens
- Drinking fountains
- Kitchen appliances

The proposed system will drain via gravity to an existing main sewer line which traverses the site and connects to existing Sydney Water Infrastructure located at the southern end of the site.

2.5 Waste Management

Waste Classification Guidelines Part: 1 Classifying Waste (DECCW 2009)

All waste generated as part of the daily operation of the Sumatran Tiger Exhibit will be managed in accordance with Taronga Conservation Society Australia's waste management policy (Refer to HR 10.2 Waste Management Policy)

The Sumatran Tiger exhibit once operational will fall under the Taronga Zoo's site wide waste management operational plan (Refer to Taronga Zoo Waste Management Ops Plan – Site Wide February 2015) which details the waste management strategy for the entire zoo.

All proposed stormwater lines within the proposed development site will be designed to the 1 in 20 year ARI as stated in Australian Rainfall and Runoff (1997). The stormwater system is designed to maximise the area of water catchment directed to the existing onsite harvesting system.

All stormwater from roadways and pathways will be directed to the Zoo's existing water treatment plant for recycling. The harvested water is filtered, and if necessary, treated with ozone to remove organic wastes. Recycled water is then connected to water features within the animal exhibits and enclosure onsite. Excess water (backwash from the filters) is returned to the recycling plant for further clean up.

In addition, waste water from the animal holding areas is also harvested and treated for reuse.

2.6 Recycled Water

EXISTING SERVICE

The proposed development is:

- Served by a 100mm recycled water main which requires diversion to ensure final location of the infrastructure is located outside of animal enclosures
- Is deemed to have a minimal increased recycled water loading from the previous development based on a fixture loading count

Based on the above noted points augmentation of the existing water infrastructure is not proposed.

PROPOSED SERVICE

It is proposed to reticulate recycled water to all fixtures not used for ablution or consumption by either humans or animals.

Examples of the fixtures include but are not limited to:

- Irrigation
- Toilet Flushing
- Urinal Flushing

- Hose Taps

Recycled water is to be reticulated from the recycled water mains that traverse the main thoroughfare of the Sumatran tiger and surrounding exhibits.

All specified fixture flow rates shall be in line with the minimum recommendations stipulated within the ESD report produced by Surface Design.

Each building will have a control valve to enable localised isolation.

Subject consultation with the ESD consultant a water meter with BMS outputs can be provided for integration into a building management system.

2.7 Trade Waste Drainage

Sydney Water have confirmed that the trade waste requirements for the preparation kitchen are limited to the following:

- That the preparation kitchen is to be classified as Deli in that no hot food preparation or cooking occurs within the kitchen.
- That approved basket traps in all sinks.
- That approved basket traps are installed in all floor wastes.

2.8 Stormwater Drainage

EXISTING SERVICES

The proposed development is:

- Served by a 2x 300mm stormwater drains.
- deemed to have a minimal increase in stormwater water generated from the previous development
- The entire Zoo site is served by a stormwater treatment plant located at the southern end of the site

PROPOSED SERVICE

All works have been undertaken in accordance with “Policy for Stormwater Management in Mosman” in accordance with Mosman Councils development control plan.

It is proposed to drain all roof and surface water within the Sumatran tiger exhibit to the existing 300mm drainage line which connects to the site stormwater drainage system. The water collected will be available for re-use throughout the entire zoo site.

All exhibit ponds shall discharge to the stormwater system in line with current approvals. Final design of the pond drainage system is subject to coordination and input from Taronga staff to ensure

procedural requirements are met. Drain Valves have been shown indicatively on the stormwater management plan HSK01/P2 prepared by AJ Whipps.

Water quality discharge measures are to remain as per the existing system which discharges to the stormwater treatment facility. No “single site” treatment measures are planned.

The proposed plans demonstrate only a minor change in impervious area. Based on this we anticipate the environmental impacts of the completed project to have an un-noticeable effect on the existing stormwater system and treatment plant.

WUSD principles to be employed with the Sumatran Tiger Exhibit include, but are not limited to:

- The collection of water into the site water recycling plant
- The provision of recycled water reticulation to all fixtures not required to be fit for human consumption
- The use of low flow fixtures and tapware

2.9 Ground Water Hydrology

Refer to the report prepared by Douglas Partners dated April 2015 for the summation of “Groundwater hydrology and quality”.

3 MAIN INFRASTRUCTURE WORKS

3.1 Affected Infrastructure

To avoid unnecessary disruption to the animals during maintenance periods or in the event of a burst pipe, it is proposed that the following pressure services be relocated out of the exhibit footprint.

The nominated services include:

- Fire Hydrant Service
- Potable Water Service
- Recycled Water Service

3.2 Connection Staging

During the course of the proposed diversions it will be necessary to isolate the services ti reduce the impact of this disruption.

The following sequencing is proposed:

1. The existing services are to be maintained until the new services are installed and have been pressure tested
2. Test the new services prior to the connection to the existing services.
3. Once testing is complete liaise with Zoo to establish most suitable off peak period to undertake the changeover process
4. Connect the new services to the existing and commission
5. Remove and dispose of redundant service pipework