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Taronga Zoo Sky Safari

Appendix GG
Flood Assessment
RTS Revision 2

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For the Wild

Overland Flooding Assessment

Taronga Zoo Sky Safari

Prepared for Taronga Conservation Society Australia (TCSA) / 16 April 2025

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1.0 Executive Summary

This Overland Flooding Assessment report has been prepared by TTW to accompany a detailed State Significant Development Application (SSDA) for the redevelopment of the Sky Safari at Taronga Zoo. The site is legally described as Lot 22 on Deposited Plan 843294 and is Crown Land managed by the Taronga Conservation Society Australia (TSCA).

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-46807958).

This report concludes that the proposed Sky Safari development is suitable and warrants approval. Essentially, TTW:

"Confirm that the development is not affected by, and will not impact, overland flooding".

This report outlines the existing conditions for the overland flow paths within the location of the Sky Safari project and the potential impact the proposed structures will have on the overland flow paths and flooding. The details are based on current available information and correspondence undertaken at the time of writing.

2.0 Introduction

This report has been prepared to accompany an SSDA for the redevelopment of the Sky Safari at Taronga Zoo, which is legally described as Lot 22 on Deposited Plan 843294.

Taronga Conservation Society Australia is a statutory body representing the Crown. The Minister for Planning and Public Spaces, or their delegate, is the consent authority for the SSDA and this application is lodged with the NSW Department of Planning, Housing and Infrastructure (DPHI) for assessment as the works are located within the Taronga Zoo site and have an estimated development cost that exceeds the \$10 million threshold pursuant to Clause 2(h) of Schedule 2 of the *State Environmental Planning Policy (Planning Systems) 2021*.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 11 August 2022 and issued for the SSD- 46807958. Specifically, this report has been prepared to respond to the SEARs Response to Submissions requirement issued below.

Item	Description of requirement
Point 4 of Attachment A of the Response to Submissions from DPHI dated 21/11/2024	Confirm that the development is not affected by, and will not impact, overland flooding.

2.1 Development Activity

The Sky Safari project is located within the Sydney Taronga Zoo and replaces the original cable cars lift installed in 1987. The proposed Sky Safari essentially replaces the existing system. The extent of the proposed works generally matches the extent of the existing cable cars lift building structures and associated external works.

The development activity involves the demolition of the existing cable cars system including the suspended cables and supporting pylons, top and lower station buildings and mechanical plant and enclosures. The new cable cars system will include construction of a new maintenance and storage building, new top and lower station buildings, mechanical equipment and plant rooms, relocated substations, new pylons and suspended cabling, and associated adjoining external works such as pathways and landscaping/ planting.

3.0 Site Description

Taronga Zoo is located at Bradleys Head Road, Mosman and is situated in the Mosman Local Government area (LGA) and on Cammeragal Country. The site is bounded by Bradleys Head Road to the east, Athol Wharf Road and Sydney Harbour to the south, Little Sirius Cove to the west and Whiting Beach Road to the north. Taronga Zoo is legally described as Lot 22 on DP843294 and is Crown Land managed by the TCSA (the Zoological Park Board). Taronga Zoo has been subject to numerous upgrades and redevelopment schemes over time, to stay compliant with contemporary regulations, meet contemporary animal welfare and contemporary visitor experience expectations.

Taronga Zoo has evolved over time from a Zoo that simply provides the traditional visitor experience of viewing animals in exhibits, to a Zoo that focusses on wildlife conservation, animal welfare and providing a range of visitor learning experiences. Taronga Zoo is one of Australia's most popular attractions, and together with Taronga Western Plains Zoo hosts more than 1.8 million visitors annually.

4.0 Project Description

4.1 Brief Description

Taronga Zoo is one of Australia's most popular attractions, and together with Taronga Western Plains Zoo hosts more than 1.8 million visitors annually. The Zoo has evolved over time from a Zoo that simply provides the traditional visitor experience of viewing animals in exhibits, to a Zoo that focusses on wildlife conservation, animal welfare and providing a range of visitor learning experiences.

Within Taronga Zoo, the Sky Safari is one of Taronga's most loved experiences and has transported more than 20 million passengers since it was first installed in 1987 and upgraded in 2000. The former Sky Safari was an ageing asset and was formally retired in January 2023. The redevelopment of the existing Sky Safari will allow the Zoo to update the now obsolete infrastructure on site and provide new facilities which provide improved amenities, ease increased demand and assist the public in moving around the Zoo.

Development consent is specifically sought for:

- Site establishment works including removal of the existing Sky Safari;
- Installation of a new 916m Sky Safari cable car system including:
 - Construction of six (6) new pylons and associated infrastructure within pylon zones within the Zoo ranging in height between 72m 5.9m (P1) to 36.5m (P5)
 - Construction of two new stations at both the upper and lower entrances within the Zoo grounds.
 - Public facilities including accessible queueing areas, ticket booths and public amenities.
 - Associated mechanical plant, servicing and storage areas for ongoing maintenance.
- Landscaping works, including new accessible pathways, planting, shade structures and seating areas and wayfinding signage. Taronga has implemented a tree replacement ratio of 2:1 for all trees removed as part of this development.
- Excavation, site preparation works and tree removal/pruning to allow the works to occur.
- Increased hours of operation

5.0 Site Characteristics

5.1 Site Location

There are two separate building areas known as top and lower station where the cable cars loading and unloading occur as well as the mechanical driving systems. The cable cars span over approximately 450m. There are 6 proposed pylons supporting the cables and are periodically situated in between the stations. The elevation change is approximately 72m from the top station to the lower station averaging an 18% fall in the natural grade. The lower station is situated approximately 14m (horizontally) from the Sydney harbour shoreline.

The site and its location are presented in Figure 1. The existing zoo area in the vicinity of the Sky Safari cable cars stations and overhead supporting cabling consists of a mix of commercial/ captivity buildings, bitumen access roads and dense vegetation with large tree canopies. There are existing road and pedestrian access paths due to the existing Sky Safari cable cars and surrounding zoo infrastructure.

The land is zoned as Special Purposes (SP1) zoological gardens.



Figure 1: Sky Safari site highlighted magenta and surrounding area of Taronga Zoo (Source: Taronga Zoo)

5.2 Site Topography

The site topography shown both on the contoured drainage maps from Mosman Council and the aerial image with overlaid elevation contours using the Mecone Mosaic mapping tool illustrates that the Sky Safari cable cars project extent is situated on a soft ridge line within the Taronga Zoo precinct. This is presented in Figure 2 and Figure 3 respectively.

Notable points include:

- The ground elevation of the lower station site varies from a low of 5.30m AHD at the southeast corner of the building where it adjoins the existing hairpin turning point of Athol Wharf Road. The external surrounds of the lower station building have several proposed high retaining walls and batters reaching to high of approximately 24.0m AHD at the northern extent of the building. The extent of the proposed lower station site will have a catchment draining within due to the excavated depth of the building and is captured through a proposed stormwater system that discharges to the existing pit within Athol Wharf Road. The existing drainage point discharges directly to the harbour shoreline.
- The ground elevation of the top station site varies from a low of 71.0m AHD at the southwestern corner of the building, to a high of 73.0m AHD along the northern side of the building. The vicinity of the building has existing established drainage infrastructure that is proposed to capture the stormwater runoff in the same manner as the original cable cars building drainage.
- Overall, the existing topography will have a negligible change due to the proposed Sky Safari project.

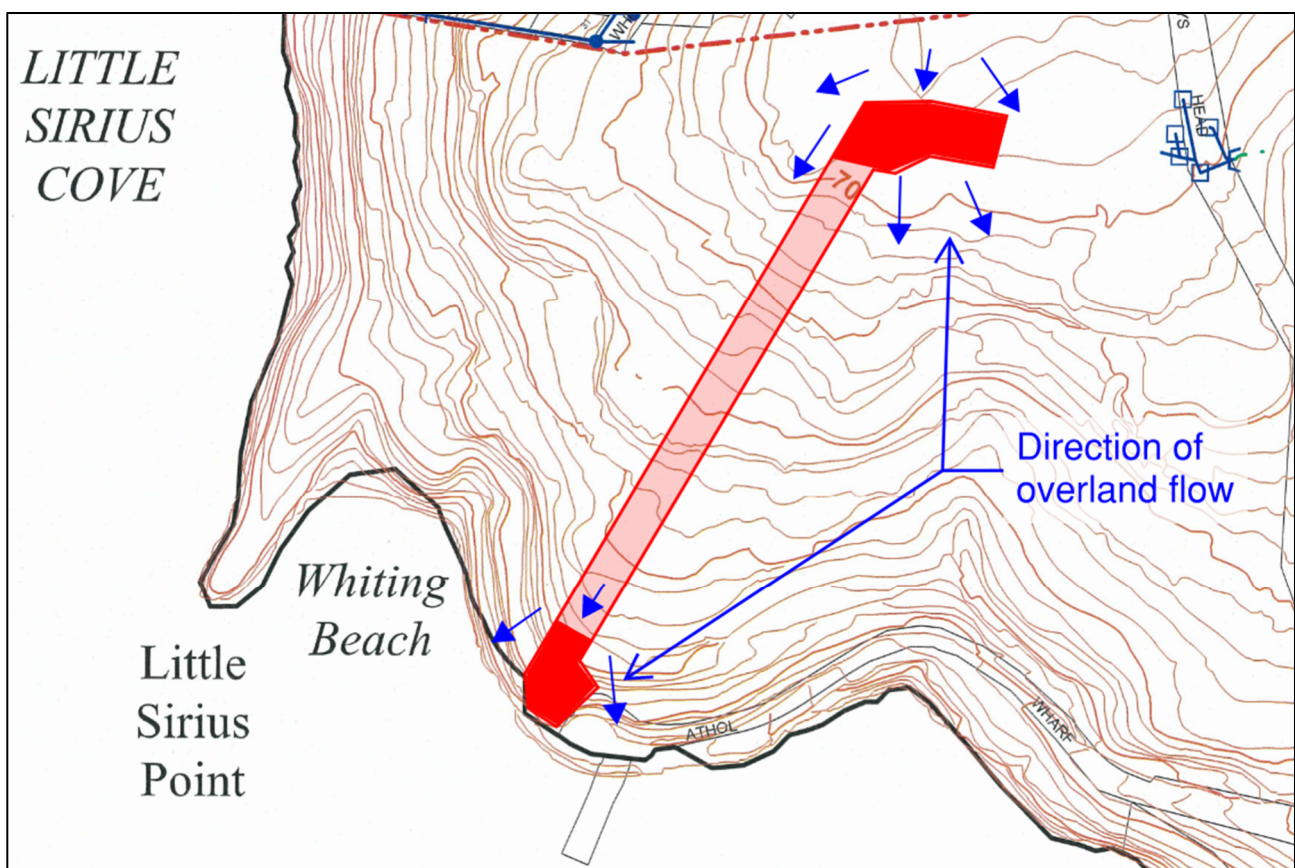


Figure 2: Mosman Municipal Council Drainage Map illustrates elevation contours of the subject site.
(Source Mosman Council)

6.0 Stormwater and Overland Flow

A review of the risks associated with stormwater and overland flow within the site has been undertaken. The risk can be considered low in terms of uncontrolled overland flow and a potential flooding. The site has an existing stormwater drainage network that manages the overland stormwater runoff and prevents a source of flooding. Since the original Sky Safari cable cars facility is being replaced with new, there are only minor changes to the existing drainage systems and general surrounding site within its vicinity. Due to the stations and cable cars alignment being situated on a soft ridge line in the topography as seen in figure 2, the overland flows are directed away from the Sky Safari cable cars facility.

Runoff not captured and conveyed by the stormwater systems are conveyed by overland flow, some of which would likely be directed across the subject site. Given the presence of existing access roads, footpaths and surrounding buildings, the stormwater network and overland flow paths are well established and has a discharge point to the harbour that quickly dissipates stormwater without risks of flooding to downstream areas noting there are no downstream properties. Upstream properties are not affected in any circumstances.

The site can be considered as 2 separate catchments due to the 2 separate station buildings. The catchments contributing to runoff flows within the separate sites' extent is shown in Figure 3. The catchment for the top station has an existing area to be demolished of approximately 840m² and the proposed top station catchment is approximately 900m². The catchment for the lower station has an existing area of approximately 1,100m² and the proposed lower station catchment is approximately 1,250m². All catchment of stormwater is contained within the Taronga Zoo boundary.

The top station increase in catchment area is predominantly increased roof area which is designed for the 1 in 100-year storm event and the receiving drainage system is designed to accommodate. The overland flow increase is negligible since the increase in roof area is offset by a proposed pervious garden bed on the southeastern side of the station building.

The lower station increase in catchment area is both increased roof area and external retaining wall extent. The overland flow increase is minor, and the proposed stormwater drainage by Meinhardt has been designed to accommodate accordingly. The increased catchment will increase the overland flow during large storm events however due to the direct access of the harbour to discharge in to, the slight increase is negligible and does not impact any properties or infrastructure downstream.

In summary the site is not affected by, and will not impact, overland flooding. The development site is contained within the Taronga Zoo site and is impacted by local overland flow only. This is managed within the site by the local drainage infrastructure and overland flow paths and has no adverse offsite impacts on either upstream or downstream properties and/or flood flows.



Figure 3: Catchment contributing to overland flows at each of the two stations. (Source: Mecone Mosaic)

7.0 Conclusion

This report outlines the existing conditions for the overland flow paths within the location of the Sky Safari project and the potential impact the proposed structures will have on the overland flow paths and flooding.

This Overland Flooding Assessment report accompanies the detailed State Significant Development Application (SSDA) and addresses the Secretary's Environmental Assessment Requirements (SEARs) issued for the redevelopment of the Sky Safari at Taronga Zoo [SSD-46807958]. It has been specifically prepared to address Point 4 of 'Attachment A' of the Response to Submissions (RtS) from DPHI dated 21/11/2024 and confirms that the development is not affected by, and will not impact, overland flooding.

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