Taronga Zoo, Mosman, NSW

Proposed African Savannah and Congo Exhibition Precincts

Historical Archaeological Assessment

and

Excavation Permit application under s.140 of the NSW Heritage Act 1977

Report to

Taronga Conservation Society of Australia

Dominic Steele Consulting Archaeology

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Prepared by	Dominic Steele
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Report summary

Taronga Conservation Society Australia (TCSA) proposes to redevelop the African-themed exhibit precincts located within Taronga Zoo in Mosman to create a new and combined Savannah and Congo exhibit. This historical-archaeological assessment has been prepared for TCSA to assess potential (non-Aboriginal) archaeological impacts that may result from the development and to address the historical-archaeological conditions of approval that form part of the Secretary's Environmental Assessment Requirements (SEARs) that have been issued for the project (SSD 8008).

With the exception of a specific section of the original Zoo path layout, the proposed redevelopment site as a whole is located within an area of the Zoo that has previously been assessed as having low potential to contain subsurface historical archaeological evidence. The historic path layout has previously been identified as having high archaeological sensitivity but medium research potential. Existing TCSA policies recommend for this item is that if new development destroys parts of the old path then there should be an archaeological investigation of the item prior to the commencement of work that would be undertaken according to the conditions of an approval issued under the *Heritage Act 1977*.

The current Savannah and Congo exhibit redevelopment proposal has the potential to impact upon one specific section of early path that is located adjacent to the Giraffe House, and also upon potential archaeological elements located at the former site of 'Stevens Lookout'. Approval from the *Heritage Council* under s.140 of the *Heritage Act 1977* is required if the original path network is to be impacted upon and excavation at the Steven Lookout may also require similar approval but it is unclear if any 'relics' were ever present at this site.

It is proposed to test excavate the locality of the path section to be affected by the proposal to identify and record the form, fabric and possible phasing of the archaeological evidence that may be present and monitor the machine-clearance works required for the development at the former (1932) Lookout in order to identify and record any physical evidence of this former if present.

The management of 'unexpected finds' during future construction works can be mitigated and managed effectively via the implementation of a) dual heritage inductions for contractors prior to works commencing in specific areas, b) using quick stop-work measures when archaeological items are exposed during ground excavation/breaking works and c) by following the due diligence procedures and protocols of the *NSW Heritage Act 1977* and *National Parks & Wildlife Act 1974.*

The methods proposed to test excavate the paths section and monitor machine works at the Lookout are described and illustrated in the attached s.140 archaeological research design and excavation methodology.

1.0 Introduction

1.1 Background

Taronga Conservation Society Australia (TCSA) proposes to redevelop the existing African-themed exhibit precincts that are located in a central position within Taronga Zoo in Mosman to create a new and combined Savannah and Congo exhibit. This historical-archaeological assessment has been prepared for TCSA to identify and evaluate potential (non-Aboriginal) archaeological heritage impacts that may result from the development and to address the historical-archaeological conditions of approval that form part of the Secretary's Environmental Assessment Requirements (SEARs) that have been issued for the project (SSD 8008).

Figure 1.1: Aerial view of the Zoo and location of the proposed Savannah & Congo Exhibit precincts (TZG Architects 2016)

This assessment establishes the nature and significance of potential historical-archaeological constraints that may exist for the proposal and outlines how future impacts to known or suspected archaeological sites and 'relics' can be avoided or mitigated according to the requirements of the *NSW Heritage Act 1977*.

This study supports an overarching Heritage Impact Assessment (HIA) that has been prepared for the proposal and which deals primarily with built heritage and non-Aboriginal cultural heritage values that are relevant to the study area (Britton et al June 2017). A separate Aboriginal heritage assessment (DSCA October 2017) to this historical-archaeological assessment also evaluates the potential Aboriginal archaeological and cultural heritage impacts of the proposed development according to the requirements of the *National Parks and Wildlife Act 1974* and in response to the outcomes of a program of Aboriginal community consultation that has been undertaken for the project.

1.2 Redevelopment proposal

The demolition and landscape plans presented below (**Figures 1.2** and **1.3**) detail the existing layout and fabric of the proposed redevelopment area, highlight what areas and items will be affected by future works (including demolition), and provides an overall concept of the extent and character of change that is required to create the proposed new African Savannah and Congo exhibit precincts.

The proposed Congo precinct will feature an expanded gorilla exhibit that will replace the present Orang-utan rainforest exhibit (Item 103B) and aviaries (Items 60B – now partly removed; 97B and 159B). A new okapi exhibit is proposed to be located to the south. To the west, the existing Waterhole precinct is proposed to be expanded for the Savannah exhibit with larger site areas proposed for giraffes, zebras and ostriches. An area at the western end of the study area (encompassing, and subsuming, the present Barbary sheep exhibit [Item 75L]) is proposed for a new lion exhibit (extracted from Britton et al 2017).

The proposal will also affect sections of the original 1910s zoo circulation (path) network, especially within, and enclosing the proposed new Congo precinct. At the northeastern edge of the redevelopment area, a section of the original 1910s path (Item 126L) is proposed to be halved in width to enable expansion of the gorilla site.

In addition to the aviaries and 1990s Orang-utan buildings and associated structures, it is also proposed to remove the 1940s Giraffe House (Item 61B part), Turner House (Item 54B), the 1987 Safari Lodge group of buildings and elements, various back of house structures (for giraffes, zebras and meerkats) and most of the relatively recent ramp structures.

1.3 Heritage contexts and controls

1.3.1 Heritage & conservation planning at Taronga Zoo

Taronga Zoo is a place of recognised heritage value and although not listed on the State Heritage Register (SHR), generally the Zoo's heritage is managed as if it were listed on the SHR (TCSA [Congo Heritage] March 2016). Under s.170 the *NSW Heritage Act 1977*, TCSA is required to prepare a Heritage & Conservation Register for the Zoo and this includes over two hundred and fifty individual built and landscape heritage items, including a number within and in the vicinity of the proposed redevelopment site.

Taronga Zoo is identified in the Mosman Local Environment Plan (LEP) 2012 as Item No. 34, and the whole of the site is shown on the LEP heritage map. Schedule 5 (Environmental Heritage) of the LEP lists individual heritage items within the Zoo and include the Rainforest Aviary (s.170 item 09B), the Elephant House (s.170 21B), the bus [tram] shelter and offices (s.170 01B), the floral clock (s.170 13B) and the upper and lower entrance gates (s.170 02B and 41B).

Figure 1.2: Existing and demolition plan A-50 (Green and dale Associates 2016)

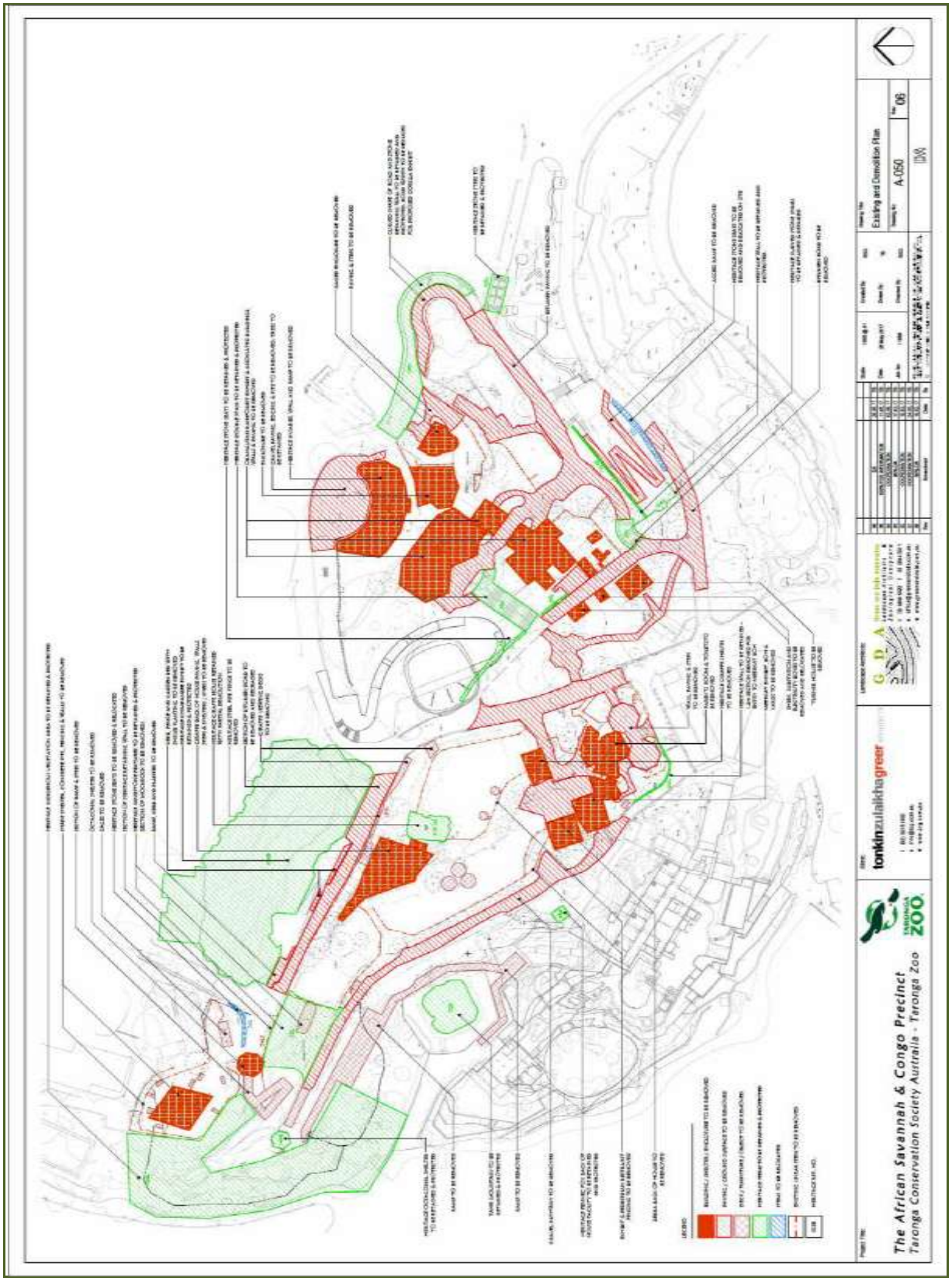
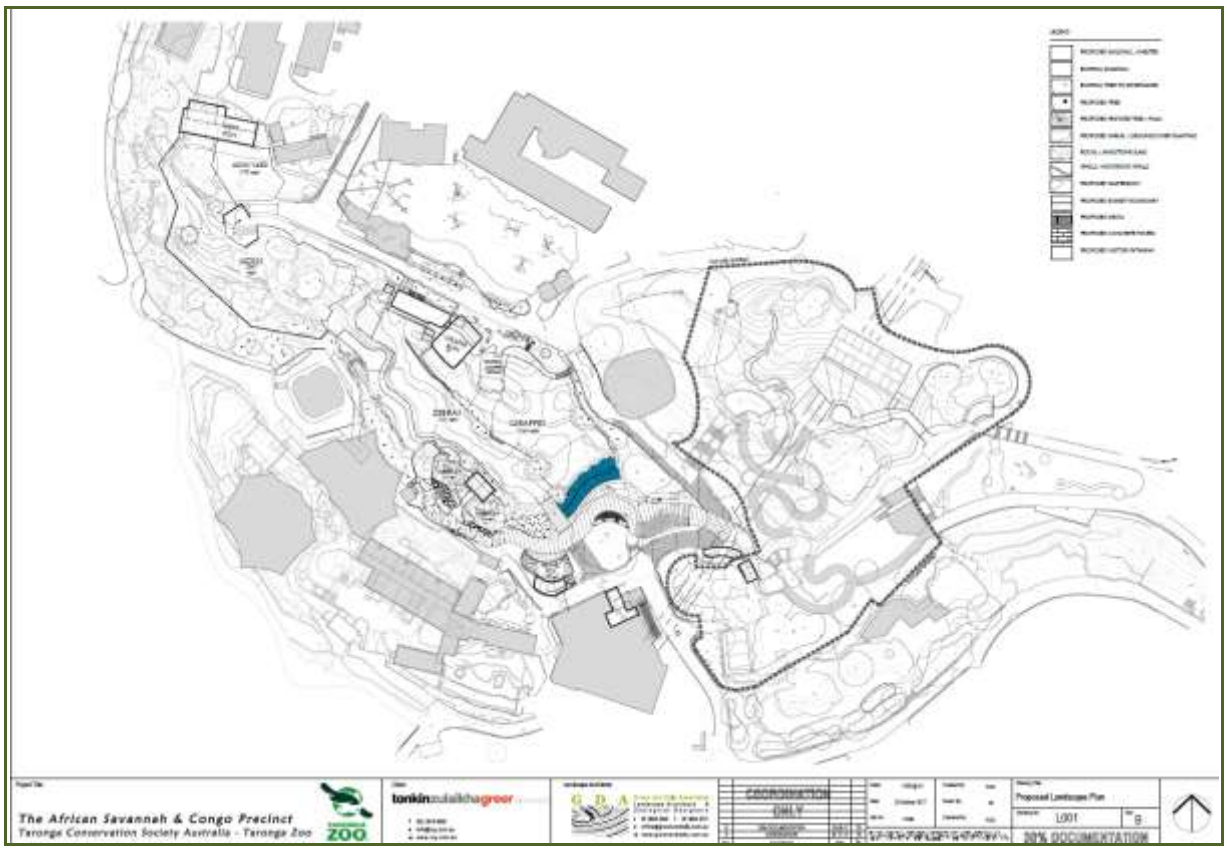


Figure 1.3: Proposed landscape plan (TCSA 2017)



1.3.2 NSW Heritage Act 1977

The *NSW Heritage Act 1977* (as amended) that is the principal legislation that provides statutory protection for non-Indigenous (European) heritage and the requirements for its management in NSW. The administration of the Act is overseen by the *NSW Heritage Branch* and is guided by the *NSW Heritage Council* in their regulatory role as part of the *NSW Department of Planning and Infrastructure*.

The primary purpose of the Act is to protect, conserve and manage the environmental heritage of the State. Environmental heritage is broadly defined under Section 4 of the Act as:

> *'those places, buildings, works, relics, moveable objects, and precincts, of State or Local heritage significance'.*

Amendments to the Act made in 2009 have changed the definition of an archaeological 'relic' whereby a relic is now referred as an archaeological deposit, artefact, object or material evidence that:

a) Relates to the settlement of the area that comprises NSW, not being Aboriginal settlement;

b) Is of State or Local heritage significance.

The new definition is no longer based primarily on age. Previously, a 'relic' was described as comprising any item older than 50 years of age.

This significance based approach to identifying 'relics' is consistent with the way other heritage items such as buildings, works, precincts and landscapes are identified and managed in NSW.

While a number of the archaeological provisions of the Act have been streamlined, the Act nevertheless retains the core principals and objectives that require anyone proposing to disturb land to obtain a permit from the *Heritage Council of NSW* (under Section 140 or Section 60 of the Act) if it is known or suspected that 'relics' of significance may be disturbed, moved, or destroyed by future land alterations and/or use.

Section 139 of the Act stipulates that:

a) *'A person must not disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit.*

b) *A person must not disturb or excavate any land on which the person has discovered or exposed a relic except in accordance with an excavation permit'.*

If the site is the subject of an order under Section 130 of the Act, an Interim Heritage Order, or is listed on the SHR, approval for an excavation permit is required under Section 60 of the Act. If the site is not the subject of an order under the Act and is not listed on the SHR, an excavation permit may be required, in accordance with Section 140 of the Act, subject to what significance the site/place has been assessed to possess. Excavation permit exceptions under Section 139(4) of the Act include:

- An archaeological assessment (zoning plan or management plan etc) has been prepared which indicates that any relics in the land are unlikely to have State or Local heritage significance (1A).
- The excavation or disturbance of land will have a minor impact on archaeological relics (1B).
- The proposed excavation demonstrates that evidence relating to the history or nature of the site, such as its level of disturbance, indicates that the site has little or no archaeological research potential (1C).

Section 146 of the Act requires that the accidental discovery of relics should be reported to the '*Heritage Council of NSW (in any circumstances, and whether or not the person has been issued with an excavation permit),* and *within a reasonable time'.*

1.4 Supporting research

This report is supported by the following documents that have been prepared by and on behalf of TSCA:

- Proposed African Savannah/Waterhole & Congo Precincts. Heritage Impact Assessment. June 2017. Geoffrey Britton Environmental Design with Nicholas Jackson, Historian and Ashley Built Heritage.
- Taronga Zoo African Waterhole/Savannah. Heritage Items at Site. Jean Rice (TCSA). March 2016 (a).
- Taronga Zoo Congo Section. Heritage Items at Site. Jean Rice (TCSA). March 2016 (b).

- Proposed African Savannah and Congo Precincts. Aboriginal archaeological due diligence assessment. DSCA. October 2017 (in prep).
- Proposed African Savannah and Congo Precincts. Aboriginal archaeological and cultural heritage assessment. DSCA. October 2017 (in prep).
- Taronga Zoo Conservation Strategy. July 2002. Godden Mackay Logan.
- Taronga Zoo Archaeological Management Plan (AMP). November 2004. Godden Mackay Logan.

1.5 Report outline

This report presents the following:

- An introduction to the project (**Section 1.0**).
- A general outline history of the Zoo and overview of the key historical developments within the proposed Savannah and Congo exhibition precincts in particular that draws upon previous heritage research compiled within the project HIA (**Section 2.0**).
- An identification of known and suspected built-heritage and archaeological items within the study area and an assessment of the impact of the proposal on these items (**Section 3.0**).
- Heritage impact assessment and recommended archaeological impact mitigation measures proposed for the project that include test excavation (for the zoo paths) and monitoring (for 'Stevens Lookout') that would be undertaken according to a s.140 Excavation Permit issued under the *Heritage Act 1977*), 'stop work measures' and 'unexpected finds' protocols (**Section 4.0**).
- Section 140 (Heritage Act 1977) proposed archaeological research design & excavation methodology (Appendix 1).

2.0 Historical overview

2.1 Preamble

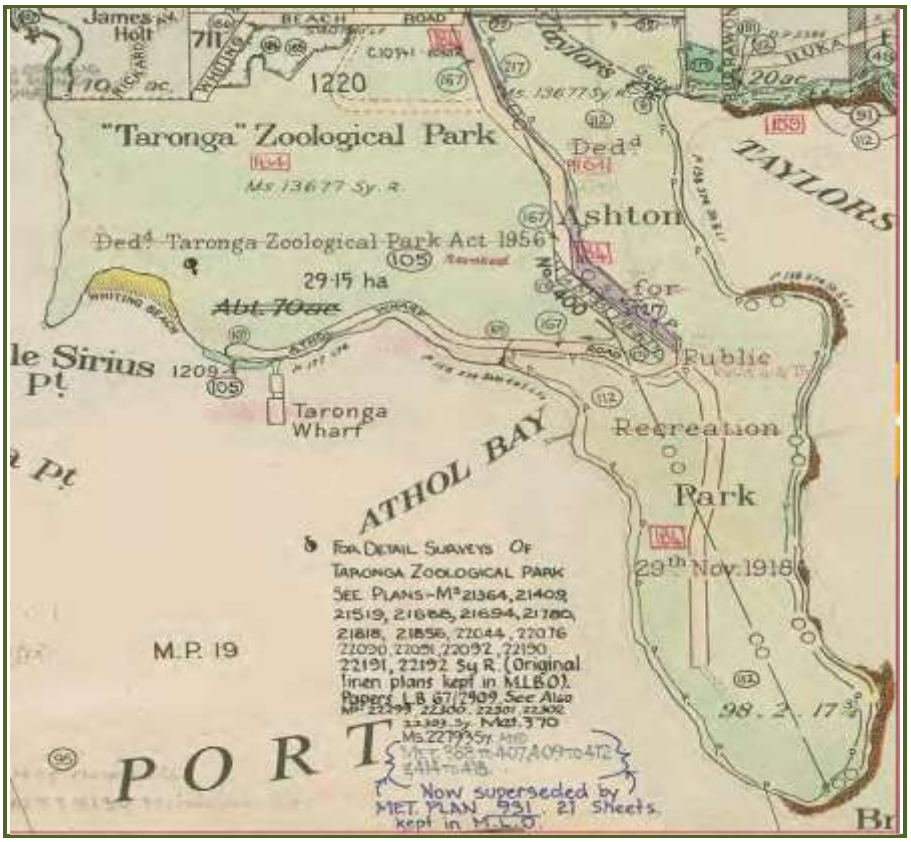
The following general historical overview of the development of the Zoo, followed by specific overview of the key developments in the proposed Savannah and Congo precincts, has been adapted from research compiled within the project Heritage Impact Assessment (Britton et al 2017) along with supporting studiers developed for the project from the TCSA s.170 Register (Rice 2017 a & b). This review provides the basis for discussion that identifies the nature and extent of the known and potential archaeological sensitivities that may require management prior to and during the proposed redevelopment.

2.2 Historical development of the Zoo

2.2.1 Five phases of site use and development

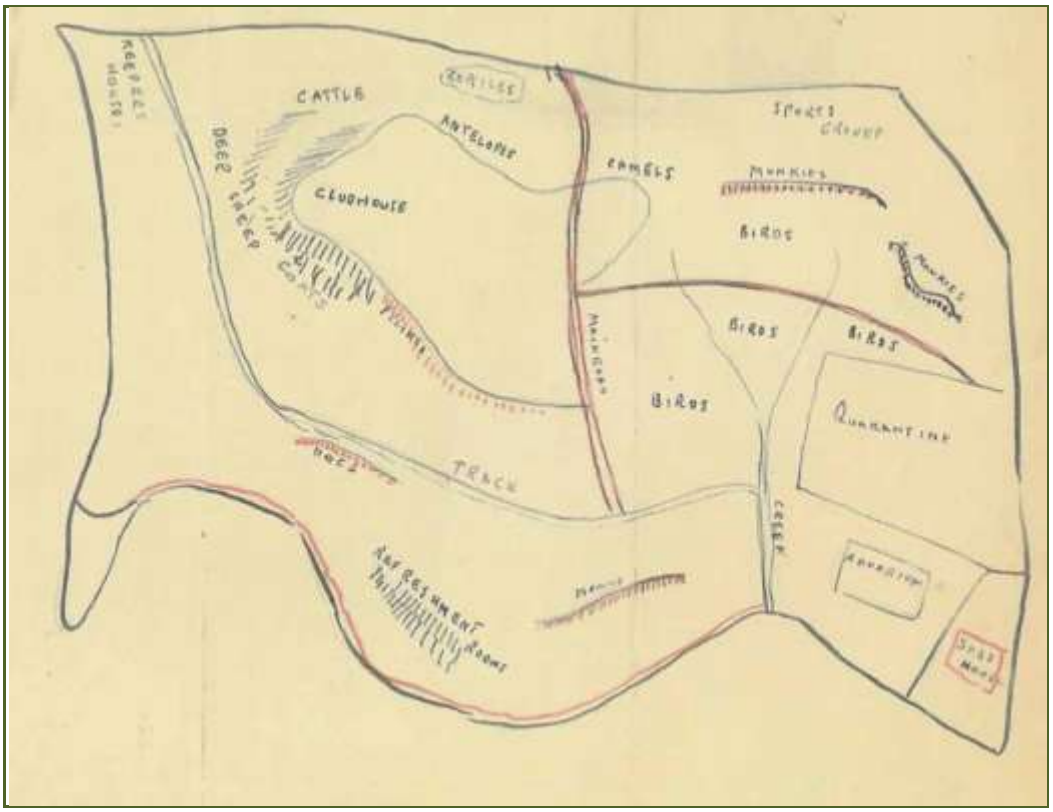
Four phases of historical development at Taronga Zoo are identified since its initial construction began in 1913 (up to c.1987) that correspond to tenures of various key zoo Directors or Superintendents (and generally reflect each director's zoo management philosophy) and these are described below with a brief discussion of the site and items in the vicinity during each period.

Figure 2.1: Extract from Parish Map showing the site of the Taronga Zoological Park and Ashton Park, which were both part of the former military reserve (Rice 2015 Figure 2.2)



The pre 1850 history of the land that was to become the zoo is not well understood. The earliest survey map of the place (as part of a broader survey of Port Jackson) by Sir Thomas Mitchell shows paths led to the various promontories of the foreshore by the early 1850s, and a track is shown leading down from the high ground occupied by the zoo to Whiting Beach and another to Bradleys Head. Additional fortifications were erected around Sydney Harbour in the 1870s and large portions of land adjacent to the future zoo were reserved for military purposes (including Bradley's Head). By 1879 a part of the peninsular was being used as a stock quarantine station and by 1900 a second area above Athol Bay was also used for quarantining imported animals. A series of animal pens and a tram line from Athol Wharf were erected and land for the Zoological Gardens was excised from the reserved military land and dedicated as Zoological Gardens in 1912. The transfer of the Zoo from Moore Park to Ashton Park at Bradleys Head had been under discussion since 1909. A 1912 survey of the proposed site of the Zoological Gardens shows the location of the Quarantine Station, tramway from Athol wharf and two walking tracks leading to a vantage point above Whiting Beach. The only structures shown are sheds associated with the Quarantine Station and part of the Quarantine Station pens and yards was incorporated into the grounds of the Zoological Park and the facility was relocated in 1916.

Figure 2.2: A hand drawn sketch dated December 1912 showing the intended compartmentalization of the site (Britton et al 2017: Figure 4 - *Taronga Zoo Archives - with SE/81 newspaper clippings)*

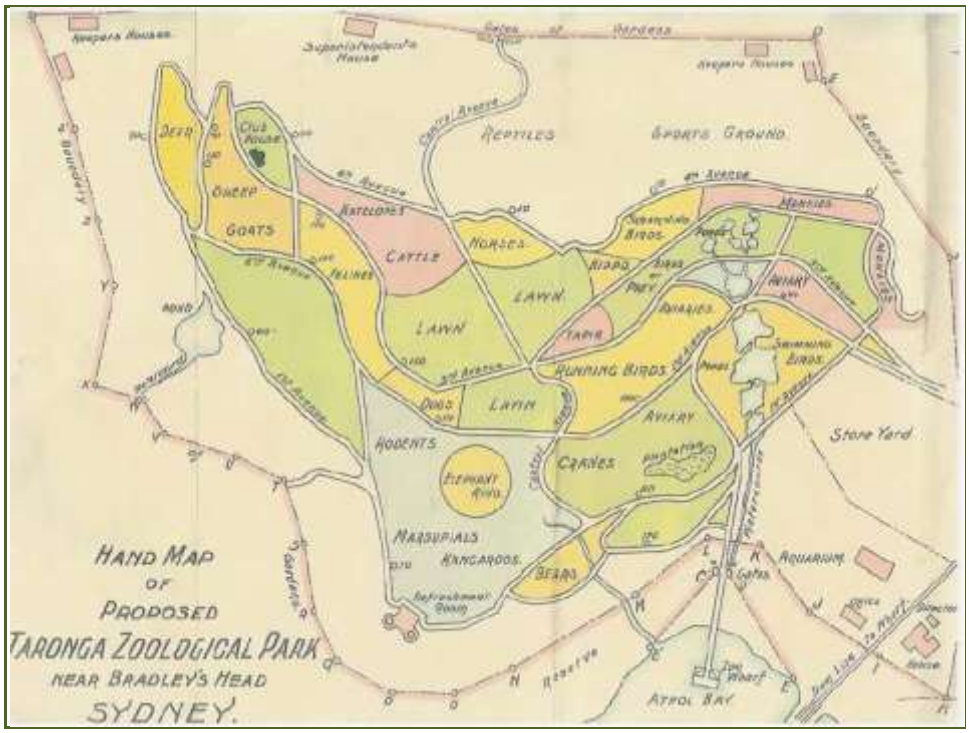


2.2.2 Phase One: Initial construction 1913-1916 (Designer Albert le Souef)

Le Souef divided the site into zones that exhibited particular animal species and included those of birds (beside a natural watercourse and spring dammed to provide ponds), monkeys, and fish (aquarium) etc. The current study area had been selected to house animals such as antelopes and zebras used to a hot and dry climate of the open African plain and the eastern boundary of this zone was defined by the proposed 'central avenue' connecting the lower wharf entry with the upper level gates. This section of the path alignment remains today. The Zoo trustees in 1913 had specifically directed the central avenue should avoid any straight lengths as *'that would be against the general design of the grounds*' (Britton et al 2017:14). By the time the Zoo was opened officially in 1916, the southern and eastern areas had been completed, but much of the western and north=western areas (and inclusive of the current study area) were under construction. By this date the government tramway and wharf had been completed. There were four zones: for animals (25 acres), for aquarium (3 acres), for sports ground (5 acres), and for amusement and picnic grounds (18 acres).15 Le Souef pointed out the main features as being (Britton et al 2017:11-12):

> *A) about two thirds of land is actually used for animal enclosures, large reserves are left picnic and sports purposes,*
>
> *B) every exhibit can be viewed from two or more sides which prevents undue massing of the public before enclosures,*
>
> *C) there are very few roads or paths, this prevents confusion and the public can easily find their way about the grounds, there will be one very heavy cart road right round the grounds, but apart from this only footpaths will be needed, no road will be straight and there will be no heavy grades.*

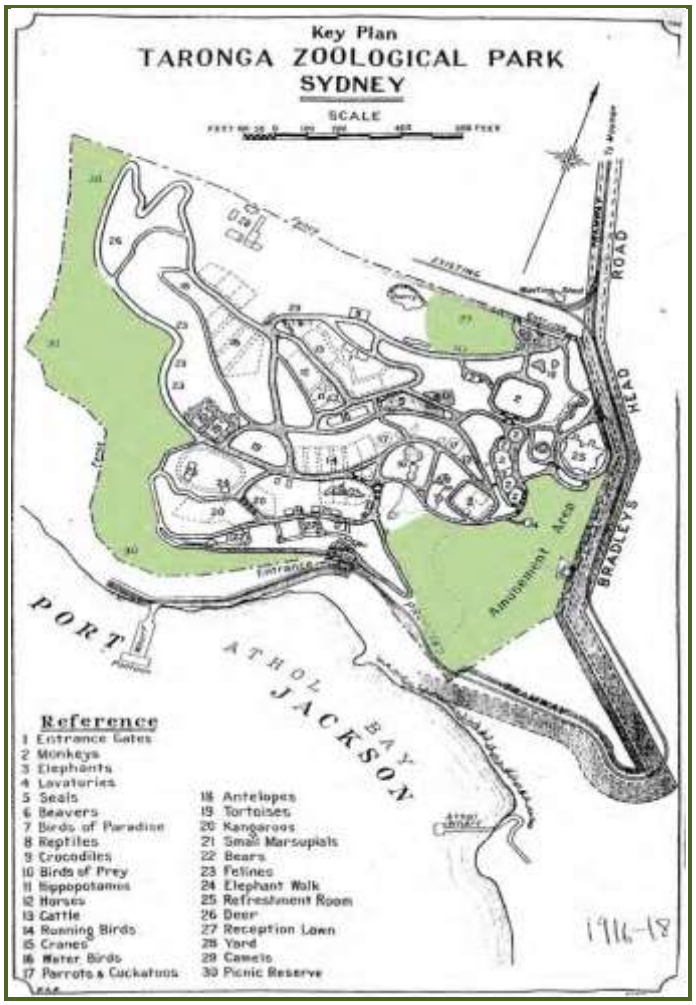
Figure 2.3: Map of the proposed layout of Taronga Zoo dated 1913. The planning had evolved and the areas set aside for specific classes of animals and birds. The paths followed the natural contours had been determined, while the idea of the north/south 'central avenue' remained in mind. (Britton et al 2017: Figure 5 - *Taronga Zoo Archives - with SE/81 newspaper clippings)*



The basic infrastructure of the Zoo was constructed during this period and included a network of pathways that were dictated in their alignment and layout by topography from the start. The natural character of the site was described as being *'a series of plateaus or grassy slopes, rising one above the other to a height of some 340 feet from water level, in a succession of terraces faced with precipitous rock or weather-worn masses of boulders, well wooded with angophora, eucalyptus, eugenia, banksia, grevillea, and other trees'* ('Taronga Zoological Park', *Australian Zoologist*, Vol 1 in Britton et al 2017:11). Pathways were largely constructed along the contours of the sandstone rock ledges traversing east-west and were connected by staircases.

The iconic look of the Zoo with its faux rock faced cement work originated in this period, as did the nature of the enclosures (Britton et al 2017:15). Under le Soeuf, Taronga was designed around the concept of a bar-less zoo, with enclosures constructed without a roof or bars (where possible) but with a surrounding reinforced concrete wall and moat on the inside separating the public from the animals. The 1916 plan below shows the area was divided into a series of plots separated by pathways. Not all the intended paths shown on the plan were completed when the Zoo opened.

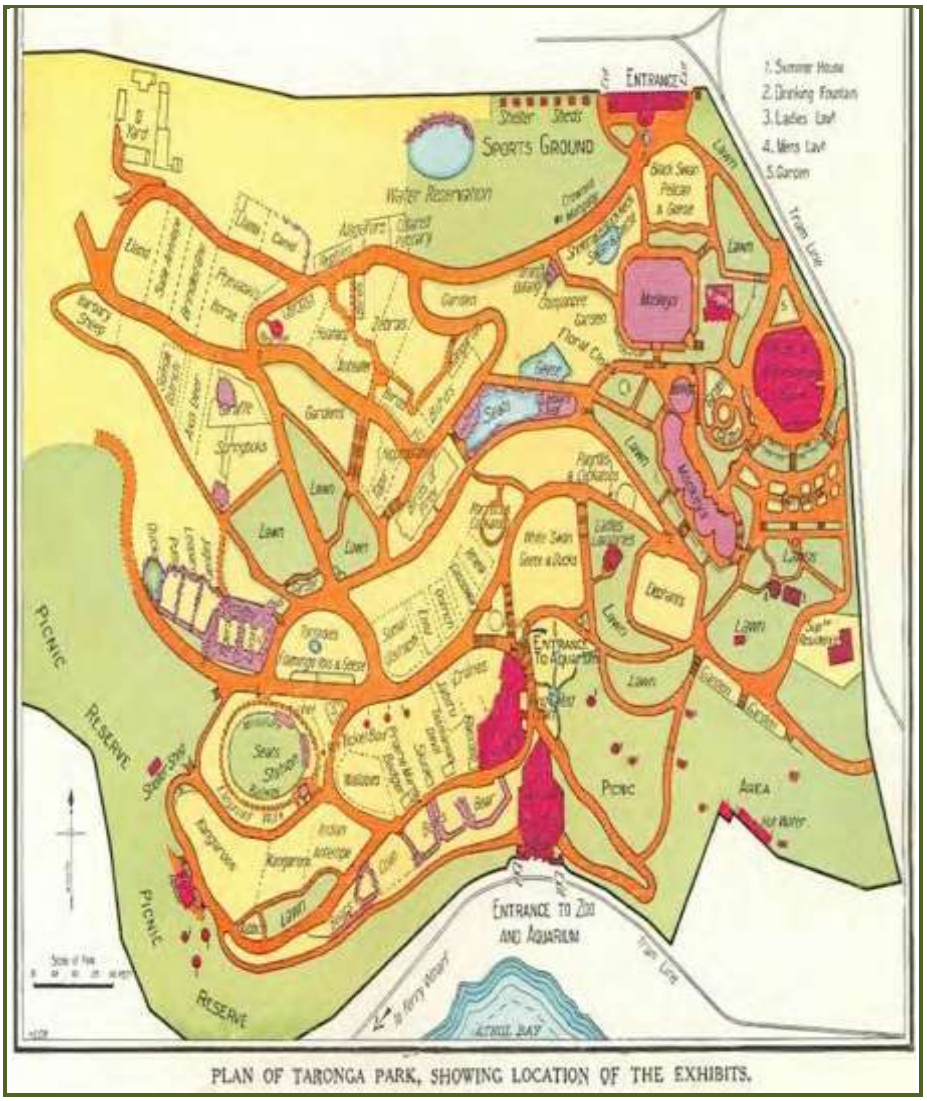
Figure 2.4: Taronga Zoological Park Sydney, 1916 (Rice 2015 Figure 2.3)



2.2.3 Phase Two: Consolidation 1916-1940 (Superintendent Albert le Souef)

This period spans the opening of the Zoo in 1916 and the departure of Albert le Souef in 1939, and was characterised by a reinforcement of the juxtaposition of cultivated ornamental gardens within the setting of the bushland landscape. The building work during the 1920s seems to have been intended to consolidate the exhibits and facilities at the eastern end of the Zoo, and a major project of this era was the aquarium. Landscaping works continued through with planting of trees, widening of paths, building additional steps, and making of dwarf walls and other 'rockery work'. Much of the new pathway system was laid in concrete and that caused unacceptable degree of glare, which necessitated building of arches for shade. At the western end, the enclosures for giraffes and Barbary sheep were built in or about 1924 (Britton et al 2017:17-18). The 1920 plan below shows that the network of paths in the north western corner of the Zoo was not completed at this time.

Figure 2.5: Map of the Zoo in 1929 (Rice 2015 Figure 2.10)



2.2.4 Phase Three: The Hallstrom Era 1941-1967

During this period the refurbishment of many existing enclosures and the design of new enclosures continued to move away from the original design concept for the zoo, with the provision of functional enclosures with concrete floors and walls as the expansion into the western portion of the zoo continued. The 1956 plan shows cheetahs, hyenas and leopards to the west of the carnivora pits but on the other side of the pathway from previous, and below in an area that had previously been set aside for picnics there were other animal enclosures but the arrival of chimpanzees and gorillas saw new enclosures erected in the area during 1953. The old monkey pit was to be converted into a mountain for climbing kangaroos and the monkeys were relocated. The 1962 aerial shows the mock rock mountain erected for the mountain goats, built using unemployment relief funds in 1932, the tiger pit and the larger lion pit with the central rocky mound. The smaller three pits erected in 1925 had partially been demolished and only the west pit remained.

Figure 2.6: Aerial image from the south in c.1962 showing carnivore enclosures top right, Tahr Mountain top left and below the road is a series of enclosures extending around to the right to a ramp leading to a new lower level road and (Ape) enclosures (Rice 2015 Figure 2.16)

2.2.5 Phase Four: Restructure 1968-1986

Many of the Zoo's aging displays were replaced after 1968 and a new emphasis was placed on the zoological and educational role of the place. In 1970 a new Masterplan for the Zoo was prepared that sought to retain what remained of the natural topography and vegetation. New pavilions and aviaries were built for Australian species that could be walked through but for the more dangerous animals traditional pits survived for longer as there were few alternatives that could provide the required separation between the visitor and the big cats. In 1977 the Western Plains Zoo at Dubbo opened where greater space allowed species separation by sunken moats designed to not interrupt views.

2.3 Development of the proposed Savannah & Congo precincts

2.3.1 Introduction

This summary of the historical development of the proposed Savannah and Congo precincts abridges a more detailed review of the study area presented in the project HIA (Britton et al 2017). This information is used here to provide an historical context for the built-heritage items and areas of potential historical-archaeological sensitivity that are identified and discussed in following sections.

2.3.2 Savannah precinct planning

The north-western sector of this zone was the last part of the Zoo to be developed (the network of pathways had not been completed by c.1920) and at first, the few exhibits then there, such as springbok, were held in fenced pens. As further exhibits were sourced from overseas during the 1920s, by the early 1930s this sector of the Zoo had been completed. The area of the proposed African Waterhole exhibit included a Giraffe House and Goat Mountain, new lookouts/shelters, and pens exhibiting hoofed animals such as barbary sheep, gazelle, antelope, and tapir. As part of this improvement rockery gardens were built at the rear of the new enclosures.

2.3.3 Giraffe House

The giraffe shelter was constructed in 1924 as a reinforced concrete post and beam structure, with faux rock exterior built with ½ inch diameter wrought iron rods, covered with mesh wire netting, and finished with cement *'rendered and coloured to imitate rock'*. The floor in 1943 it was observed as being *'very old cement or asphalt substance or both*' and *'damp and dangerous to animal's condition*'. The floor was regraded and paving with wood blocks was installed. The giraffe enclosure was fenced with pipe railing in 8 ft panels with wire mesh. The giraffe exhibit was further developed further in the 1940s and 1960s. In 1942, the south western shelter and high screen walls were constructed at the southeast corner and along the southern boundary, and the yard was also regraded and filled (coke breeze and clay). The large semi-open eastern shelter was built sometime in the 1950s.

2.3.4 Tahr Mountain (1932)

The artificial mountain for the Himalayan Tahrs was opened in 1932. The new enclosure was intended to provide an 'artificial natural environment' in the 50ft high artificial mountain. A 13ft high perimeter fence was built to keep the animals from leaping out of the enclosure.

2.3.5 Waterhole exhibit (1984-1994)

The Waterhole Exhibit was completed in 1984 and was further developed in the early 1990s. The Waterhole Hole exhibit featured a mixed display of giraffe, zebra, ostrich and pygmy hippopotamus. Large hoofed animals were exhibited on a grassed and landscaped site with a screened walkway. Elements of value within these exhibits include the early (mid-1920s?) sandstone walling (74L) built over natural rock outcropping at the back

of the bongo area and the faux-rockwork at the back of part of the zebra exhibit. Near the current meerkat enclosure is a section of early Zoo retaining wall (132L) featuring stone cresting and faux-rockwork. The wall defines an edge of one of the original 1910s pathways (99L). In the vicinity of this early path through the precinct, and above Tahr Mountain, are further sandstone retaining walls and sandstone outcropping.

Britton et al (2017:36-38) report that the historical development of this precinct had commenced in the mid 1920s. By the late 1920s the Barbary sheep, springboks, and deer were being exhibited in the area around the Giraffe House, and by the early 1930s this precinct had been fully developed for Barbary sheep, gazelle, kudu, Oryx, buffalo, Indian deer, springboks, and tapir exhibits. The number of exhibits was reduced in the late 1940s or early 1950s, and by 1956 the hoofed animals comprised the Barbary sheep, Indian deer, antelopes, and small buffalo. The earliest and most substantial of these enclosures was the Barbary sheep enclosure that was located at the western most hairpin bend in the precinct. It comprised terraces of rock faced cement. The construction of this enclosure and the Giraffe House appear contemporary (1924-1925).

2.3.6 Lookouts and shelters (1932)

The western lookout and shelter were constructed about 1932 and the timing of these visitor facilities coincided with the completion of the Harbour Bridge. It was named after Premier Bertram Sydney Stevens.

2.3.7 Congo precinct planning

Although this part of the Zoo has exhibited birds for some time, in 1916 most of this precinct housed and exhibited cattle (zebu) and also hippopotamus, with some aviaries for birds of prey and paradise. From the late 1920s and into the 1950s there were clusters of aviaries in an area to the north of the birds of prey aviary and the neighbouring seal pond. The remainder of this zone housed zebras, tapir, lamas, peccary, and hippopotamus. This area changed little over the following decades except for the introduction of the African elephant enclosure built about 1940.

2.3.8 Early aviaries

Birds were a major component of the original zoo planning and a number of aviaries were built in successive programs from the 1910s. Many have since been demolished, and those remaining within the proposed Congo Precinct are the remnants of bird exhibits that had occupied the discrete area between Hallstrom Square, the Koala House and the current lemur exhibit. Most of the aviaries demolished were arranged in a line along the pathways above Hallstrom Square and above the current lemur exhibit. The remaining aviaries within the upper Congo precinct are all basic pipe-framed structures, infilled with fine mesh, with concrete (often faux-rock) rear walls and niches for shelter.

2.3.9 Hippopotami house (1916)

The 1916 hippopotamus enclosure comprised both a shelter bathing pool. The shelter/pen was 14ft by 12ft by 6½ ft in height and was constructed in reinforced concrete and faced externally in cement with a mock rock finish. It was enlarged and improved in 1932.

2.3.10 Gorilla exhibit (1966)

The area occupied by the current gorilla enclosure was originally designated for 'running birds' (ostrich, emus and rheas) and remained the case until in 1988 when the western end was redesigned to accommodate giant pandas donated from China. An earlier circular aviary for parrots and parakeets at the eastern end was subsumed in the 1990s for a new gorilla exhibit (which was formerly the aviaries of the running birds) which also took-in at the northwest corner the African elephant house that was built about 1940.

2.3.11 Barbary sheep enclosure (African waterhole precinct)

The Barbary sheep exhibit is located within the western 'hairpin' bend of the 1910s site access layout, and is another early zoo feature where animals have been associated with the particular site since from its inception (mid-1920s). Both the Barbary sheep and giraffes exhibits are linked by the early retaining wall of sandstone and rendered rubble listed as Item 74L suggesting that the intervening wall also dates to the mid-1920s. The exhibit features prominent natural sandstone outcropping along with faux-rockwork infill. Perimeter fencing around the Barbary sheep exhibit is a relatively recent, but following the inside curving line of the hairpin path, there is an original (mid-1920s) stone edge defining the exhibit to the west and south.

2.3.12 Octagonal shelter/shed (African waterhole precinct)

Although the s.170 Register inventory for this item (144B Local/High Significance [Conservation Strategy]) dates this shelter as late 1920s in date, it was constructed along with a nearby 'Stevens Lookout' in 1932. The views are important part of the history and reason for existence of the Shelter and Lookout.

2.3.13 Grand staircase

This double staircase (item 59L Local/Exceptional Significance) to the north of Hallstrom Square is a major component of an ensemble of landscape structures probably built in the late 1910s or 1920s.

2.3.14 Curved sandstone steps & walling

Items of conservation value that include components of the initial (1910s) zoo construction phase include under this category the enveloping pathways (99L) and curved sandstone steps (57L) built from stone that may have been won from the old quarry located near the upper Sky Safari building.

2.4 Previous archaeological investigations in adjacent precincts

2.4.1 Due diligence Aboriginal archaeological assessment

A due diligence Aboriginal archaeological assessment (DSCA May 2016) has evaluated the potential impact of the proposal via a change in use of the locality below. It comprises a small and well defined parcel of vacant space surrounded on all sides by roads and buildings. It retains natural sandstone topography, along with a few native trees interspersed amongst a generally sparse and degraded ground cover. It is sloping land and dominated by a series of large and irregular outcrops of benched, boulder and shelved sandstone.

Figure 2.7: Area surveyed in 2016 for a due diligence Aboriginal archaeological assessment

Field survey located a collection of broken beer and medicinal and ceramic items on the ground surface, and a sample were (temporarily) collected and recorded. Possibly 100+ more fragmentary items were also observed. The materials extended down the sloping ground and had been probably dumped from higher topography at some point in the past. The beer bottles and a few of the medicinal bottles are all dated 1925 to 1927, and no obviously recent materials (plastic, late twentieth century glass types) were identified. This may suggest the 'leftover' bit of topography may have remained unused and undisturbed for a considerable period of time.

The artefacts may relate to the discard of objects by workers for example during construction activities (for possibly the roadways) in the 1920s that have only recently been disturbed by recent brush turkey nesting activity. The materials could also relate to historic 'clean up'(s) of this type of domestic rubbish which has been dumped down the slope from the north, along with other soil and mulch materials.

The likelihood that intact subsurface archaeological deposits with further artefacts remain buried at the site is low, but it is probable that further artefacts remain buried below current ground levels but which occur within the fill and underlying redeveloped loam mantle is possible.

Figure 2.8: Garden planter edge/low retaining wall at the north-western corner of the study area. The humic soil materials with artefacts seemingly accumulated as a result of one or successive 'dumping' episodes that included the glass and ceramic materials

Figure 2.9: Distribution of dark soils materials with European artefacts down slope

Figure 2.10: Date stamped beer and medicinal (and aerated Schweppes) bottles (the items have been put back in their place of recording). These items may date the deposit they are in, and may have remained undisturbed since that time (1920s) and/or they may relate to the dumping periodically, or in one go, of these materials at any time since

Figure 2.11: Tea cup fragment with printed gold rim (3mm wide) and image of a kookaburra upon a branch. The kookaburra is encircled by the words 'Taronga Park Sydney'. Atop the circle is a bejewelled crown. The insignia is a dark reddish/brown in colour. Printed on the inside of the cup is a thin gold line (1mm)

Figure 2.12: The Zoo tearooms/refreshment rooms had their own china and had a high reputation (jean Rice). This cup fragment would have been from there (note china in the foreground)

2.4.2 Archaeological (s.140) test excavations in the Sumatran Tiger exhibit

A Heritage Management Plan prepared for the Sumatran Tiger exhibit development (DSCA January 2016) identified the proposal would impact one location with potential to contain archaeological evidence for a section of path forming part of the original Zoo pathway network (**99L**). The remainder of the redevelopment was assessed to be situated in an area of low to no identified historical archaeological sensitivity. However, the proposal would require the removal of 'mock rock' features within (redundant) 1930s carnivore enclosures that potentially included (buried and/or incorporated) earlier construction/modification features and fabrics of value. The HMP recommended the paths site be tested archaeologically using manual excavation methods and machine-assisted excavation methods for the removal of (hard) mock rock materials in the carnivore dens.

Figure 2.13: Location of 2016 test excavation for the path in the Tiger exhibit

Figure 2.14: The Sumatran Tiger HMP identified that the enclosures within the redevelopment site with heritage significance had a mix of mock rock (of different periods), natural sandstone, and other later fabrics. Archival recording of the 'dens' and 'caves' was undertaken independent of this study but compliments the results of the subsurface investigations reported here

Test excavation for the paths and in the carnivore dens both revealed unremarkable subsurface profiles comprising largely crushed sandstone rubble and clay fill deposits over modified sandstone bedrock. No significant archaeological deposits or features were identified in either locality. Neither area has been assessed to retain any further archaeological potential in the areas that are to be affected by the project works.

For the paths, excavation revealed a comparatively uniform profile of crushed sandstone and clay loam in the space between the older (rounded) kerb and gutter that runs parallel with the modern roadway and edging. The loam appeared re-deposited (or recently redeveloped) and overlay a uniform deposit of crushed sandstone and clay loam fill that is likely to extend across and along much of the roadway length. No evidence was found, or survives in this locality, of any former path surfaces and fabrics. Excavation in the dens revealed a similar shallow of sandstone and rubble clay (construction) materials over bedrock and no features or deposits of noted were recorded during the work.

No artefacts useful for dating, or any other interpretative purpose, were located during the investigations.

At the completion of the investigations neither of the areas appeared to retain any further archaeological potential and thereby no further archaeological investigation was considered to be warranted on the basis of the low significance of the archaeology recorded.

Figure 2.15: Excavation for the path was restricted to one side of the existing (innermost) kerb and gutter. The road alignment has been used for service routing progressively over time and retains minimal to no archaeological potential

Figure 2.16: Sandstone rubble exposed below brick kerb with rounded cement render finish

Excavation in the den revealed a very shallow profile consisting of modern soft fall and soil materials over very compact sandstone and clay (and some surface and modern) brick rubble fill over sloping but graded sandstone bedrock. The materials appear to have been reused from the construction of the enclosures in the 1920s for the filling of the interior of the 'box' at foundation level prior to the introduction of the ground coverings.

Figure 2.17: Excavation in the carnivore dens used a mechanical excavator to remove building fabrics and fill of low archaeological sensitivity and significance. Shown below is 'topsoil' over brick & mortar (modern) and sandstone clay-rubble fill over sandstone bedrock

3.0 Identification of heritage items

3.1 Preamble

The following discussion draws on prior research undertaken by Rice (TCSA March 2016 a & b) that identifies heritage items located within and in the vicinity of the proposed Savannah and Congo precincts that are listed on the TCSA s.170 Register. The 2004 AMP (Godden Mackay Logan 2004) for the Zoo includes archaeological management zones and identifies areas of potential sub-surface historical-archaeological sensitivity that are also relevant to this assessment.

The findings of a preliminary due diligence Aboriginal assessment (DSCA May 2016) undertaken for the project during preliminary planning which focused on a small (1.000 sqm) area of 'leftover' natural sandstone topography situated in the northwest of the precinct is likewise referred to in following sections following the location of a number of early twentieth century glass and ceramic items.

Finally, the results of previous s.140 (manual) historical-archaeological test excavations completed on the alignment of the original path network, along with machine-assisted testing in selected animal enclosures to inform planning for the expanded Sumatran Tiger exhibit, are also reviewed here because they illustrate some archaeological expectations that are discussed in following sections of this report.

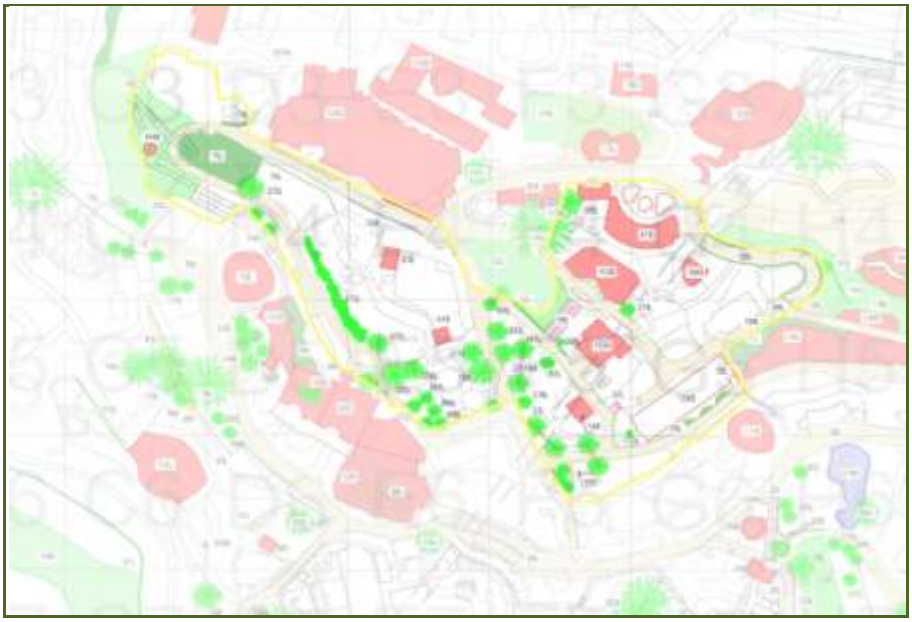
Figure 3.1: Existing condition of the proposed Savannah (left) and Congo Exhibit precincts (TCSA March 2016 a & b)

3.2 Savannah precinct

3.2.1 TCSA s.170 Register

Items of significance listed on the TCSA s.170 Register within and in the vicinity of the redevelopment area are mapped below.

Figure 3.2: Heritage items located in and within the vicinity of the proposed development (TCSA October 2017)



3.2.2 Historical archaeology

The map below identifies potential historical-archaeological items previously assessed to occur within the study area. The remainder of the proposed development area was identified in the 2004 AMP to retain no potential for sub-surface historical-archaeological deposits to survive.

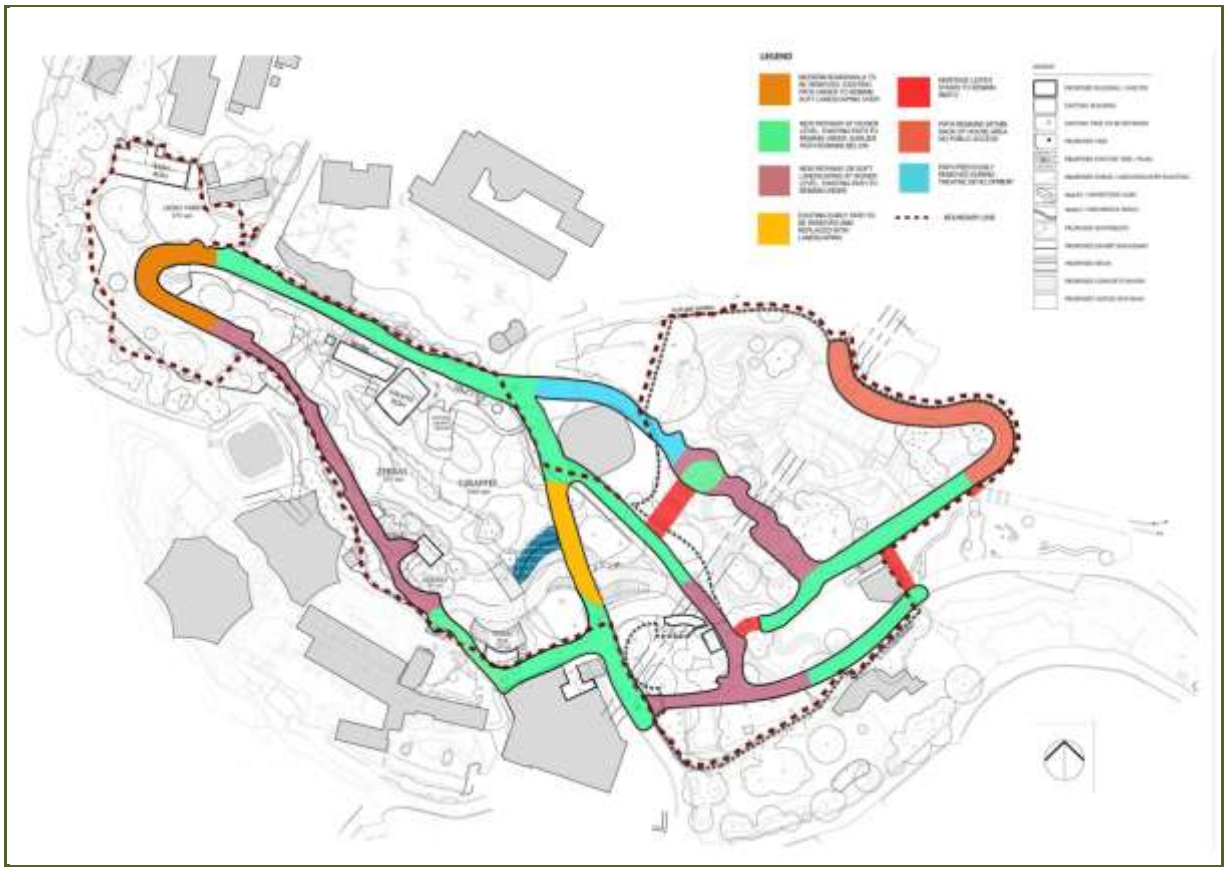
- Item 21- Former pathway 1935 to 1988
- Item 22 – Shelter shed 1935 (see note below)
- Item 23 – Original pathway 1916 to 956

Figure 3.3: Historical archaeological management zones in the proposed development area (TCSA October 2017)

3.2.3 Areas of potential archaeological sensitivity

The maps below show there are extensive areas of the original Zoo path layout in the proposed development area precinct, including one section adjacent to the Giraffe House that will affected by the proposal.

Figure 3.7: Potential historical archaeological impacts of the development proposal on a section of the former path network situated (and shaded dark blue) running alongside the southern eastern corner of the Giraffe House exhibit (TCSA October 2017)



4.0 Archaeological impacts & mitigation measures

4.1 Historical archaeological impacts

With the exception of the historic path layout, the proposed redevelopment site as a whole is in an area of the Zoo that has previously been assessed and zoned as having largely low to no identified potential for subsurface historical archaeological evidence to be present. The 2004 AMP identifies the original path layout as having high archaeological sensitivity but medium research potential. Policies recommend for this item by the AMP are that if new development proposals destroy parts of the old path that there should be an archaeological investigation (monitoring, test or full excavation) prior to the commencement of work. The investigation would be undertaken according to the conditions of an approval issued for the work under the *Heritage Act 1977*.

The current Savannah and Congo exhibit redevelopment proposal has the potential to impact one specific section of early path that is located adjacent to the Giraffe House, and also upon potential archaeological elements at the former site of 'Stevens Lookout' that will also be affected by the proposal.

4.2 Recommended mitigation measures

Approval from the *Heritage Council of NSW* under s.140 of the *Heritage Act 1977* is required if the original path network is to be impacted upon.

Excavation at the Steven Lookout may also require such approval but it is unclear if any 'relics' were ever present at this site and the potential archaeological sensitivity of this site is considerably less than for the path's locality situated at the Giraffe House.

In the event that unexpected historical archaeological 'relics' are encountered during future construction phases in general, those works are required to cease and the *NSW Heritage Office* notified, pursuant to Section 146 of the Act.

4.3 Recommended archaeological test excavation and monitoring

The locations and methods where manual archaeological test excavation is proposed for the section of historic path adjacent to the Giraffe House, and at Stevens Lookout, where it is proposed to undertake archaeological monitoring of machine-assisted excavation are described in the attached s.140 archaeological research design and excavation methodology.

Appendix 1

Archaeological Research Design, Excavation & Recording Methods

Archaeological Research Design, Excavation and Recording Methodology in support of an Excavation Permit under s.140 of the NSW Heritage Act 1977

Overall Heritage Impact Assessment of the Project

Two main potentially negative archaeological heritage impacts identified for the redevelopment proposal are the removal of a section of the original path network (**99L**), and site of the former 'Stevens Lookout' that is not specifically listed on the Zoo s.170 Register and may also have no physical archaeological remains. The paths are of State significance and any 'relics' identified at the Lookout would be items of Local significance. It is proposed to test excavate the locality of the path to identify and record the form, fabric and phasing of the archaeological evidence and monitor machine-clearance works at the former (1932) Lookout to identify and recorded any physical evidence of this former if present.

The management of 'unexpected finds' during future works can be approached via the implementation of a) heritage inductions for contractors prior to works commencing, b) using effective stop-work measures when archaeological items are unexpectedly exposed and c) by following the due diligence procedures and protocols of the *NSW Heritage Act 1977* and *National Parks & Wildlife Act 1974.*

Archaeological Heritage Impact Mitigation Measures

Paths (test excavation)

A location(s) within the area where future works may remove a section of the early Zoo path in the vicinity of the Giraffe House (below) will be chosen for manual test excavation to record the fabric, alignment(s), construction method and history of change(s) of the network that may be in evidence. This data would inform options for the interpretation of the former line of the path in the future exhibit such as where new paths cross the line of the old path through path design or other educative media (signage).

The excavation of one or two archaeological strip trenches placed across the width of the existing path (from 'kerb to kerb') may reveal evidence for the alignment, form, fabric and possible phasing of the original path in this locality. On the basis of what was seen in a comparable s.140 excavation context in the Tiger exhibit, the original surface fabric(s) of the former path had been removed entirely by previous services routed under the existing bitumen path, where in that instance only edge fabric such as kerb and gutter materials survived

The form and complexity of changes to the original path network can be appreciated in this image where there are a number of different types and materials of construction along and lining the path. This section will not be affected by the development

Recording methods to be employed during all stages of the test excavation are summarised below:

- A survey datum would anchor all records for the levels of deposits and features revealed by future s.140 excavation and monitoring works.
- Scaled site plans and profile or cross-section drawings showing the location of all deposits and features revealed by excavation will be prepared as required.
- Descriptive data for all archaeological features and deposits revealed will be recorded on sequentially numbered pro-forma context recording sheets supplemented by preparation of a matrix showing the stratigraphic relationships between features and deposits.
- Photographic recording of all phases of the work on site will be undertaken.
- All artefacts revealed by excavation will be retained for analysis. They will be cleaned on site, sorted according to fabric classes; bagged and boxed with reference to the context from which they were recovered. Few artefacts with any secure provenance are not expected.

Dominic Steele would nominate as Excavation Director. Post excavation analysis of cultural material (if any is recovered) will involve the following procedures:

- All significant cultural material recovered during the excavation program will be catalogued and analysed for presentation and inclusion in the final project report.
- Post-excavation analysis of materials recovered during excavation will be undertaken at *Dominic Steele Consulting Archaeology's* office in Croydon.

At the conclusion of the investigations the results would be documented in a final excavation report to comply with the conditions of the s.140 Excavation Permit. The long-term storage and management requirements of any 'relics' identified and collected would be confirmed at the closure of the test excavations.

Stevens Lookout (archaeological monitoring).

Archaeological monitoring of machine work in this locality is proposed to identify whether 'relics' associated with the Lookout are present