The design of a wildlife medical centre at the National Zoological Gardens.

by Nadia Lloyd-Lister
The design of a wildlife medical centre at the National Zoological Gardens.

by Nadia Lloyd-Lister
The design of a wildlife medical centre at the National Zoological Gardens

by

Nadia Lloyd-Lister

Submitted in partial fulfilment of the requirements for the degree

MAGISTER TECHNOLOGIAE: ARCHITECTURE: PROFESSIONAL

In the Department of Architecture

FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT
TSHWANE UNIVERSITY OF TECHNOLOGY

Supervisor: P.A. Greyvensteyn
Supervisor: Prof J. Laubscher

Course co-ordinator: Prof G.S. Steyn

November 2014

I hereby declare that the dissertation submitted for the M.Tech Architecture: Professional, at the Tshwane University of Technology, is my own original work and has not been submitted to any other institution. All quoted texts are indicated and acknowledged by a comprehensive list of references.
Abstract

Fig: 1. Lauila the Kodiak bear at the NZG.
(Photography: by Nicole Lloyd-Lister, 2014)
Twenty-eight year-old Laula resides in the north-western corner of the National Zoological Gardens (NZG). She is one of the zoo’s most beloved residents. As great as that is, being queen of the zoo doesn’t come without its challenges. Earlier this year, Laula tragically fell ill; and while this is nothing that the zoo’s dedicated staff couldn’t manage, it was Laula’s size and the limitations of the zoo’s medical facilities that made what should have been a routine treatment into a complicated affair. Laula is a 285kg Kodiak bear. She was too big and too heavy to receive treatment in the zoo’s existing hospital, nor could she be brought to the surgery room because access exists only through the administration area and through a retrofitted passage from the courtyard. This left no other option but to treat her in her enclosure. As a result, the staff were not able to keep with the field’s best practices, and Laula was put at risk of further medical complications.

Laula represents but one case of the zoo needing to make concessions on the standard of care they are able to offer its residents because of lack of needed facilities. It would be sad enough if the problem was contained to just the zoo, but when the 2014 Living Planet Report has measured a 52% decline in biodiversity in the past 40 years, it would be flagrant irresponsibility to confine that the challenges like the aforementioned were confined to the National Zoological Gardens alone—rather, this is but one instance of a global concern.

The National Research Foundation has recognized the zoo as a critical player towards the conservation of animal heritage in southern Africa. Yet, as we have seen, tantamount to having outstanding research methods is having the needed facilities to deploy them effectively. In order for this to come to bare, the zoo requires a careful assessment of architectural concerns. This thesis presents exactly those.

The wildlife medical centre here proposed precipitates out of a comprehensive study engaging the following issues of concern; zoo healthcare and rehabilitation, subnature and animal architecture. In applying the framework “form follows function”, the issue of “animals as architects” was identified as a concern unique to this study, as well as it was the foundation for its central concept.

The proposed site location currently supports the out-dated hospital (built in 1969), which is on the zoo’s south-eastern corner along Boom Street. As such, demolition of the location’s existing facility is a required antecedent to this proposal’s measures. Its facilities include a veterinary hospital, research laboratories, a bio-bank, temporary wards, and rehabilitation wards whose design derives not only from traditional matters of architectural concern but also the informed, first-hand knowledge of the animals’ needs and preferences as understood by the zoo’s staff.

Additionally, the proposed design exposes and showcases the zoo’s research facilities along its public interface in order to better serve its educational efforts. This intervention brings to life a new way of perceiving the animals. To see the animals in their most fragile state can make accessible to the visitor a level of empathy that heretofore could only be known by their caretakers. Thus, this proposal presents the means for promoting conservation awareness and, at the same time, empowers its dedicated staff.
TABLE OF CONTENTS

1. Introduction
   1.1. Outline brief
   1.2. Needs & current situation
   1.3. Argument
   1.4. Background & history
   1.5. Research methodology

2. Issues of concern
   2.1. Zoo healthcare & rehabilitation
   2.2. Subnature
   2.3. Animal architecture

3. Precedent studies
   3.1. Snowdon aviary
   3.2. Prahran hotel
   3.3. Wellington zoo hospital
   3.4. Oregon zoo veterinary medical centre

4. Analysis and appraisal of context
   4.1. National analysis
   4.2. Regional analysis
   4.3. Urban analysis
   4.4. Neighbourhood
   4.5. Site
Introduction

1.1. Outline brief
1.2. Needs & current situation
1.3. Argument
1.4. Background & history
1.5. Research methodology
Fig 2. Kangaroo & Koala enclosure from NZG cable car.
(Photography: by author, 2014)
1.1. Outline brief

This thesis is about the amalgamation of the current veterinary, research and bio-material storage functions in order to design a new Zoo Medical Campus at the National Zoological Gardens (NZG) in Boom street, Pretoria, Gauteng. The design comprises of a bio-bank, research laboratories, veterinary hospital, and temporary and rehabilitation wards. Bringing these functions under one roof eliminates the contamination risk of samples, animals and the staff. It allows for linear medical and research processes. It also creates a didactic public route isolated from the private processes of the staff area.

Facilities at the NZG

The veterinary hospital: The zookeepers along with the vets monitor when a zoo animal would need examination, radiology or surgery. The National Zoo’s hospital only tends to help off-site animals in the case of the animal being donated to the zoo;

Research laboratories: This is where at least 80 research projects in the fields of conservation and biodiversity are undertaken annually by the research staff with the assistance of interns, technologists, PhD and Masters students;

Bio-bank: The Wildlife Biomaterials Bank is the facility which stores a rich diversity of biological samples such as sperm, pathology samples, environmental tissue and cell cultures;

Temporary and rehabilitation wards: Hygienic and humane enclosures include; an intensive care unit (ICU), a large animal ward, carnivorous and large primate ward, aquatic ward, ungulate ward, aviary as well as a quarantine area.

On the first of April 2004 the National Zoo was declared a facility of the National Research Foundation (NRF). It moved from governments’ Department of Arts and Culture to the supervision of the NRF based on its potential to advance research in the fields of wildlife nutrition, behavioural ecology, wildlife epidemiology, molecular genetics and reproductive biology. This provides a platform for the entire research community to partake in the studies done at the zoo, including universities, conservationists, veterinarians, scientists and zoologists, local and international. (The National Zoo’s changing role... in support of conservation research, 2009)

The envisaged campus will aim to place the National Zoological Gardens at the forefront of this emerging knowledge field not only in Africa but globally too. To reach this benchmark a conclusive study will engage the following issues:

1. zoo wildlife healthcare and rehabilitation
2. subnature; and
3. animal architecture.
1.2. Needs & current situation

Macro context: global

Biodiversity decline

The World Wide Fund for Nature (WWF) presents findings in their ‘Living Planet Report 2014’ of a 52% decline of vertebrate species between 1970 and 2010. This means that a census shows that our global wildlife population is half the size it was 40 years ago. (McLellan, 2014:8).

Table 1. The number of declining, stable and increasing populations from 1970-2010 showing a great increase in the number of declining population. (Biodiversity Decline. S.a.)

Holocene Extinction

According to the article on biodiversity decline the appearance and disappearance of species have occurred since the beginning of time. Extinctions occur at a rate of about 0.1 to 1 species per million years. The sharp peak of this rate at several points marks the five “mass extinction” events. These are thought to have been caused by natural phenomena such as continental drift, impact from meteoroids or comets and climate change. One such event happened 65 million years ago when a giant asteroid struck Earth just off the coast of Mexico, taking the dinosaurs and two-thirds of the earth’s species with it.

Evidence suggests that a sixth mass extinction is currently underway due to the accelerated rate of biodiversity decline. Approximately 900 extinctions have occurred since the 16th century. The previous five mass extinctions occurred over thousands of years whereas the current mass extinction is most probably going to occur within 200 years. Two-thirds of the species on earth are said to be extinct by the end of the 21st century. The most startling of this evidence is that it will be the first mass extinction caused by humans. (Biodiversity Decline. S.a.).

Table 2. Rate of mass extinction.
(Biodiversity Decline. S.a.)
<table>
<thead>
<tr>
<th></th>
<th>Number of described species in IUCN database</th>
<th>Number of threatened species in 2006</th>
<th>Number of threatened as % of described species</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vertebrates</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mammals</td>
<td>5,416</td>
<td>1,093</td>
<td>20%</td>
</tr>
<tr>
<td>Birds</td>
<td>9,934</td>
<td>1,206</td>
<td>12%</td>
</tr>
<tr>
<td>Reptiles</td>
<td>8,240</td>
<td>341</td>
<td>4%</td>
</tr>
<tr>
<td>Amphibians</td>
<td>5,918</td>
<td>1,811</td>
<td>31%</td>
</tr>
<tr>
<td>Fishes</td>
<td>29,300</td>
<td>1,173</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>58,808</td>
<td>5,624</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Plants</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mosses</td>
<td>15,000</td>
<td>80</td>
<td>0.53%</td>
</tr>
<tr>
<td>Ferns and allies</td>
<td>13,025</td>
<td>139</td>
<td>1.0%</td>
</tr>
<tr>
<td>Gymnosperms</td>
<td>980</td>
<td>306</td>
<td>31%</td>
</tr>
<tr>
<td>Cotyledons</td>
<td>199,350</td>
<td>7,086</td>
<td>4%</td>
</tr>
<tr>
<td>Monocotyledons</td>
<td>59,300</td>
<td>779</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>287,655</td>
<td>8,390</td>
<td>3%</td>
</tr>
</tbody>
</table>

Table: 3. Table of threatened species, summary, compiled by International Union for the Conservation of Nature, The IUCN Red list of Threatened Species. (Biodiversity Decline. S.a.)
**Micro context: zoo specific**

With the NZG being the only zoo on the continent with a statutory mandate to embark on scientific research, an upgrade of the infrastructure is imperative in both the physical architecture and intellectual capacity. In 2005 the NZG established a research department among its many other departments, for instance: Commercial Services and Business Development, Conservation Education & Public Engagement in Science, Landscape and Civil Facilities, Conservation and Animal Collections, Human Resources, Financial Administration and finally Scientific Services; the latter is managed alongside the research department by Prof Antoinette Kotze (Kotze & Nxomani, 2011). Approximately 300 staff members are appointed by the NZG of which about 80 are zookeepers and 12 are scientists and veterinarians. The NZG’s research and veterinary departments amalgamated into the Centre for Conservation Science in 2009.

**Veterinary hospital**

Currently there are plans to expand the hospital in order to meet the requirements of the new mandate. Certain challenges subsist in the existing building. The examination room is now a passage to the operating room to avoid having to take the animals through the administration office, as there is no direct access. Thus, the operating room functions as an examination room concurrently.

**Research laboratories**

On 31 March 2009, this research department was housed in an existing east-west facing two-storey building, which was renovated from a lucerne storage into laboratories, offices and a small library. The Research department delivers services to the SAPS and a separate monitored facility is needed to do forensic investigations.

**Bio-bank**

The current Bio-bank occupies an existing 1950’s house with high tin ceilings and a fireplace. The functions of the Bio-bank were forced into this protected heritage building.

**Temporary and rehabilitation wards**

The existing carnivore wards are right opposite the bird cages and blankets are used as screens to minimise predator versus prey stress. The temporary bird enclosures alongside the hospital are keep birds that await space in the zoo. These enclosures are overcrowded and inappropriate for the duration of the birds’ stay. Birds are brought here from the Airport when imported illegally and have to wait on the tedious trials of the perpetrators.

Mosibudi Mangena, the former minister of Science and Technology said in his keynote address at the launch of the NZG Centre for Conservation Science in 2009, 

“The southern part of Africa has one of the world’s greatest animal heritages. Other countries do not have this privilege or this responsibility, so we must take special measures, and in many cases original measures, to conserve this heritage for future generations.”

(The National Zoo’s changing role... in support of conservation research, 2009).
1.3 Argument

This thesis argues that an upgrade of the built veterinary and research infrastructure at the National Zoological Gardens will place the facility’s growing intellectual capacity at the forefront of animal conservation in Africa. This will be made possible by innovative research, the education of future professionals and continual public awareness by means of tourism and recreation.

Fig:3. Veterinary hospital. (Photography: by author, 2014)
Fig:4. Research laboratories. (Photography: by author, 2014)
Fig:5. Bio-bank. (Photography: by author, 2014)
1.4. Background & history

Evolution of “the zoo”

The earliest proof of animal collections dates back to 2500BC in ancient Egypt. Animals espoused a unique religious significance and were kept in glorified ‘menageries’; a term describing an impressive collection of animals for the purpose of display, religion or aggrandisement of the owner. The Greeks, Romans and Chinese later established menageries for exotic hunting, entertainment of guests and display of wealth. Private animal collections continued into the 18th century among the noble and royal families. (Higgenbottom, 2004:57).

By the 1960’s society became more aware of environmental and animal welfare implications. Attention now drew towards the architecture of the enclosures. The evolution of the displays can be understood in terms of first, second and third generation exhibits (ibid.;58):

First generation 18th and 19th century
Barred cages for purpose of isolating the animal.

Fig:6. 1902 historical enclosure at NZG. (Photography: by author, 2014)

Second generation early 20th century
Larger concrete enclosures surrounded by moats

Fig:7. Dassie hill built in 1932 at NZG. (Photography: by author, 2014)

Third generation mid 20th century
Naturalistic displays aiming to mimic the animals’ original habitat.

Fig:8. Aviary at NZG showcasing immersive enclosure design. (Photography: by author, 2014)
Fourth generation 21st century

Mixed species enclosures, rotating species among enclosures and elevated trails to and from enclosures.

Fig:9. Rhino and Zebra enclosure.  
(Photography: by author, 2014)
National Zoological gardens of South Africa

According to Biglake (1954:1), there is probably no zoological garden in the world that came into existence in the same unorthodox manner as the National Zoological Gardens. The farm called “Rus in Urbe”; stretching from Boom Street to the Apies river, belonged to the late J.F. Cilliers and was located adjacent to the Transvaal Museum, Formerly the “Staatsmuseum der Zuid-Afrikaansche Republiek.”

The Director of the Transvaal Museum Dr. J. W. B. Gunning had a vision, one that garnered much attention and initial setbacks. The Museum regularly received live animals that were kept in its 17 square metre backyard. These animals were destined to be stuffed and put on display in the Museum. Luckily Dr Gunning had other plans for the animals. He encouraged residents adjacent to the museum to complain about the noise and odour caused by the animals in the museum’s backyard. He obtained permission to transfer animals to “Rus in Urbe” on 21 October 1899 and this was the humble beginnings of what we know as the National Zoological Gardens. (Biglake, 1954:2).

The National zoo’s hospital and research laboratories

Captain F. C. Simpson was the first part time veterinarian at the zoo; he worked from 1906 until 1949. A tiger had turned on its mate for no known reason causing its death. If the zoo had had hospital facilities the veterinarian might have been able to save the animal. As a result the board of trustees opened an animal infirmary fund with the sum of about £10,000, in November of 1942. In 1969 the funds had been collected and hospital was finally built. (Biglake, 1954:85).

Fig:10. Taxidermy in derelict museum. (Photography: by author, 2014)
1.5 Research methodology

The research approach consists of quantitative and qualitative information on the subject at hand, and therefore, it is a mixed-method approach. The method includes analyses of the macro context of wildlife conservation of zoos in South Africa in a comparative manner, information on the evolution of animal enclosures and state-of-the-art design and construction methods of zoo healthcare facilities. The micro context analyses are more focused on elements at the NZG such as site analysis, functional procedures and archetypes of the built context.

The research and design strategy includes published literature in the form of books, dissertations as well as online journals, newsletters and papers. These cover the fields of conservation, ecotourism, wildlife medicine, wildlife in captivity, and environment and animal architecture. Besides the descriptive analysis of relevant literature and precedents, a range of on-site surveys took place, more specifically, photographic analysis as well as interviews with the specialist veterinarians, scientists, and hands-on specialists—the zookeepers.
issues of concern

2.1 zoo healthcare & rehabilitation
2.2 subnature
2.3 animal architecture
The issues to be explored are categorised to cover a broad aspect of the design synthesis. The first, Zoo Healthcare and Rehabilitation, covers the **procedural and programmatic** aspect of zoo healthcare and the processes linked to it. Secondly, the **environmental** issue of subnature (to be explicated later) and a potential altered perspective on the natural surroundings will be explored. The designing and building of animal architecture then refines the research around **aesthetical and architectural** aspects of the design development.
2.1. Zoo healthcare and rehabilitation

2.1.1. Relevance and Importance

The essentials of zoo healthcare and rehabilitation will be studied in order to identify certain processes. These processes will assist the design in detail with regards to circulation, accommodation and material choices. According to Loomis, (2012b) treating domestic pets is much like treating humans, except pets can not talk and treating zoo animals is much like treating domestic pets, except zoo animals can’t be restrained. When an animal needs treatment it is important to return it to its group as soon as possible as some species are intolerant to individuals outside their group. Common medical issues include anything from tuberculosis to the regular administration of birth control drugs; individual health must be monitored while taking into consideration population health. It is important to understand that wildlife, domestic animals, and humans are all susceptible to the same infectious agents and environmental stresses. Only a holistic approach to medicine will further research efforts to determine how disease agents spread throughout the world. (Fowler & Miller, 2008:ix)

Fig:11. Animal hospital. (Source: [http://cargocollective.com/Rosita/Wellington-Zoo-Animal-Hospital], 2014)
2.1.2. Current practice

Typical wildlife medical concerns.

The types of wildlife medical problems are as ranged as with humans. Diseases, infections, fractured or broken limbs, birth defects, visual and dental problems are but to name a few. Zoonoses are diseases that can be transmitted from animals to humans. Proper infrastructure must be implemented such as showers or hand wash basins where animals and humans come in contact. Captive wild such as bustards are more at risk of contracting avian influenza from doves and pigeons than when in the wild.

Detection of illness.

Behavioural pattern changes.

Behavioural detection is fundamentally used to detect illness but some species such as predatory birds avoid showing signs of weakness until the later stages of illness. Knowing the animal’s regular routine, habits and posture, assists in the detection of irregularities. Faecal samples can be tested regularly and frequency, position and duration of urination and defecation could also indicate incipient illness. Other indicators include locomotion, food intake and scent behaviour. (Fowler & Miller, 2008:38-40)

Thermography

Thermography is a diagnostic tool that is completely non-invasive as it does not require any handling or restraint of the animal. It detects inflammation, bruising and cardiovascular diseases among others by measurement of surface temperatures. (Fowler & Miller, 2008:20)

Biopsy darting

This tool allows collection of epidermal tissue without the complications of anaesthetics or restraint.

Mechanical or chemical restraint.

These are usually the last resort options when an animal needs examination. Mechanical restraint is when the animal is placed between hydraulic cage walls to hold it in place for examination while chemical restraint includes tranquilising and anaesthesia. These methods are stressful for the animal and keeper.
Procedures and clinical care programmes

**Behavioural Training**
Animals are trained through positive reinforcement to perform behaviours on command to make the medical procedures easier to perform. Behaviours include cooperative mobility onto scales, into restraint devices or into containers to be taken to the hospital. The veterinarians are then able to collect urine, do tuberculin testing, and do vaginal and rectal examinations. (Loomis, 2012b). An example would be that an elephant can be trained to present its foot through a wall opening to do foot trimming. Long term treatment such as insulin shots are now administered regularly on account of behavioural training. (Fowler & Miller, 2008:66)

**Drug Administration**
The most adequate method for drug administration is orally, this can be achieved by separating the particular animal at feeding time with the drugs contained in its feed. (Loomis, 2012b)

**Wildlife surgery**
Pandu, a 130-kilogram Malayan tiger from Houston Zoo required surgery on his right elbow as he had bone chips hindering his mobility. Successful surgeries require surgeons with experience which is not the case in zoos, zoo medicine has unfortunately not lived up to its domestic pet counterpart. Zoo veterinarians are still leaving animals with scars and stitches that are chewed and scratched complicating the situation with infections. Pandu received arthroscopic surgery which is a minimally invasive procedure - only a small incision was necessary to remove excess bone. He recovered days later. (Berkowitz, 2012)
2.1.3. Findings

Circulation and logistical processes

(Hospital & Laboratory)
Process when animal falls ill.

A Conversation with zookeeper Mr. Johnson at the NZG (keeping bears, large antelope/ungulates and white rhino)

When a particular animal falls ill the zookeeper goes to the hospital to fill out a Vet request form, and the rate of emergency is noted. The veterinarian will then visit the enclosure to inspect the animal and a decision will be made whether or not to do tests. If tests are required, the animal will be anaesthetised to draw blood or it could be shot with a biopsy dart (which is later collected by zookeeper). The sample will be administered by the respective laboratory and the veterinarian will decide if the animal needs treatment or drugs. Large animals such as elephants will be treated or operated on in the enclosure. Other animals are anaesthetised and loaded onto a truck to be taken to hospital. In case of death or euthanizing, the animal is taken to the incinerator on the northern part of the zoo to be destroyed.

Fig:18. Hospital and laboratory process. (Diagram: by author, 2014)
Animal treatment procedure

Notes taken during a Conversation with NZG veterinarian Dr. Adrian Tordiffe;

When an animal needs examination it is dropped off at the examination room from where it can go directly to the x-ray or operating; thereafter it is taken to intensive care or the recovery ward before its return to the enclosure.

Fig:19. Hospital process. (Diagram: by author, 2014)
(Bio-bank)

Bio material storage process

The following was noted at the NZG during a conversation with researcher Dr. Desire Dalton;

Specimens could be extracted from the animal during examination, operation or tranquilisation in the enclosure or it can be acquired from a public researcher. At the bio-bank the sample will be taken to the dirty room to be packaged, labelled and recorded onto the digital library’s database. It is then placed under the required temperature where it can be tracked and located for future experiments.

Fig:20. Bio-bank process.
(Diagram: by author, 2014)
2.1.4. Conclusion

These processes inform the circulation and programme of the proposed medical centre. An understanding of the three different fields will result in an informed design where form follows function. An important principle is that wild animals are not easily restrained and that complicated anaesthetic procedures have short reversal times, thus the connection between the drop off, examination, surgery and rehabilitation areas should be closely associated and easily accessible. The laboratories and bio-bank should be accessible to staff and public, and separate from the circulations of the wildlife hospital.
2.2. Subnature

2.2.1. Relevance and Importance

This design takes a stance as a prime example of nature within in the city. Expectedly an analysis of the environment is undertaken. Within the urban context, nature is an element of the environment just as architecture is, and it is important to look at all elements of the environment, pleasant and unpleasant. According to Gissen (2009:1) “Subnature analyses the socio-political histories of twelve ever present subnatures: dankness, smoke, gas, exhaust, dust, puddles, mud, debris, weeds, insects, pigeons, and crowds.”

Professor Sheila Kennedy from Massachusetts Institute of Technology suggested that this thesis should analyse the modern idea of hygiene. The notion of subnature explores the inclusion of the elements namely, atmosphere, matter and life, which are usually undesirable for society, into a revised concept of environment. It also serves as a theoretical foundation to justify the unified occupancy of human and animal. It seems radical to coalesce subnatural elements with the accommodation of a veterinary hospital, laboratories and bio bank, but the literature offers a fresh perspective. Anthrozoology, the interaction between human and animal, is facing a new era as conservation of fauna and flora is no longer ignorable. Therefore alternative approaches have to emerge to ensure a predetermined public reaction.

Fig:21. City exhaust.
(Source: [http://instagram.com/demidism], 2014)
2.2.2. Current practice

According to Gissen (2009:22) many other texts show the study of engagement between architecture and the more normative forms of nature, but his book is the first to explore the story of the less normative forms of nature, dubbed subnature. This book argues that, “...forms of nature become subnatural when they are envisioned as threatening to inhabitants or the material formations and ideas that constitute architecture.” (Gissen. 2009:21) For the purpose of this thesis, one subheading under each element will be researched to understand why we regard them as perhaps unhygienic.
Exhaust (atmosphere)

Exhaust is the subnatural by-product of vehicles, roads and highways. As much as planners and urban engineers try to harness or control it, it still rids the city with its looming smog. The existence of exhaust has sparked the creation of new design strategies involving alternative urbanism that reconceptualise the relationship between roads and buildings. (Ibid:72) Currently architects address this malodorous emission by segregating building interiors and the roads. In 1923 Le Corbusier addressed what he called a general unpleasantness of the roadway in this manner. Figure 22 illustrates his comparison of the 19th century city where exhaust envelopes the built environment and a new architecture surrounded by greenery. Even though pollution was not the main focus of his study it is evident that it informed his design process. (Ibid:73)

A more recent example was the design of the B.mu Tower, done by the firm R&Sie(n). Their approach was less about defending the building from exhaust or eradicating the problem altogether, and more about engaging an understanding of our conventional attitudes toward pollution. (Gissen. 2009:79) They designed a gallery, offices and a cafe for the highly polluted Bangkok. They wrapped the building in an electrostatic skin that drew the exhaust of the roadway to the building's exterior surface. This partially filtered the air on the outside and created a climate controlled environment on the interior, together with creating an awareness of the polluted context. (Ibid.)

An application of this can follow or contradict the work of Le Corbusier and R&Sie(n). Due to the site being close to the very exhaust filled Boom Street it should protect the animals from the smog whether it incorporates it or deflects it.

Fig:25. Air pollution.
(Source: [http://mashable.com/2013/01/14/beijing-air-pollution/], 2014)
Dust (matter)

“Dust is the result of natural decay in buildings, pollution from cars and factories, and the result of landscapes transformed by disasters.” (Ibid:88) Dust will always be present; it is unwanted and usually removed, but John Ruskin regarded it as denying a building of its own historical record. He also viewed dust as proof that materials were constantly evolving, as dust crystallises into stone and then deteriorates into dust again. (Ibid:96) Denise Scott Brown and Robert Venturi also examined dust in their book Learning from Las Vegas (1977).

Pretoria has recently experienced two exaggerations of both natural and manmade dust, namely the dust storm on 16 October 2014 and the implosion of Munitoria on the 7th of July 2013.
Fig:26. Munitoria Implosion.
(Source: [http://miniblasters.co.za/implosions/], 2014).
“Of all birds, pigeons retain a type of lesser status through their interactions with architecture in that they stain and infest buildings and transform the sounds emanating from them.” (Gissen. 2009:180)

During the middle ages pigeons were not so frowned upon and pigeoniers, buildings where pigeons were bread for their eggs and meat, became a distinct architectural type. Roosting pigeons were kept in temples where they laid eggs which were sold as souvenirs and used for sacrifices. (Ibid.) “Le Corbusier admired the pigeons as a type of natural module that worked well with the architectural scenography of existing buildings.” (Ibid:185). They add a certain aesthetic and scale to photographs of buildings and also occur in many contemporary renderings by architects and students.
2.2.3. Conclusion

The modern idea of hygiene is questioned as this section aims to positively change perspectives of the unwanted. It will not exclude or segregate the animals as expected but integrate them into the fabric of the building; allowing them to nest on the window sills or to roam about among the people. Thus the boundaries of the norm are traversed in order to innovate conservation as a whole. It is the designer’s duty to understand the environment surrounding the building but it is also the designer’s duty to formulate an understanding thereof to the user.

“In contrast to nature, subnature is not only about exposing the realities of external environments. Rather the theory of subnature proposed within this book supports the notion that architecture and the environment are produced simultaneously. “ (Gissen. 2009:25)
2.3. Animal architecture

2.3.1. Relevance and Importance

Animal architecture is particularly relevant to this accommodation, both in the typical idea of what an animal housing should be as well as, what it could be. In this issue two aspects will be researched. Architecture for animals focuses on the human aspect of how we currently design for animals. Architecture by animals looks into how animals design for themselves and applies to how we should design for them as well as how we could design for ourselves.
Architecture for animals

The Modern idea of architecture for animals.

Bernard Tshumi recently underwent a six year refurbishment of the Paris Zoological Gardens. In his approach he states that the architecture needed to be the background of animal display. He further noted that the architecture for the animal areas and for the people will take the same approach as opposed to designing naturalistic for animals and modular for people. The Sahel-Sudan enclosure housing kudus, ostriches and giraffes is a zig-zag larchwood skin concealing corrugated-metal-clad indoor facilities, and the space in-between creates a hidden passage for the zookeepers. (Fixen, 2014:220)

The Modern idea of architecture for humans

In the same breath Toyo Ito explained at the UIA conference (2014) in Durban, that architecture for humans need not conform to the conventional grid and that the grid should be designed. He is a prime example of using nature as precedent. The following are points in his design process aimed to reach a type or style unrelated to the conventional grid systems. (Ito. 2014)

Possibility of architecture beyond Modernism:

1. is closed off from natural environment
2. saves energy and maximises use of natural energy; and
3. restores vital energy by symbiosis with nature

Fig:28. Savanna enclosure, Bernard Tshumi. (Fixen, 2014:220)

Fig:29. Library in Tama Art University by Toyo Ito. (Source: [https://www.tumblr.com/search/tokyo+university+of+the+arts], 2014)

Fig:30. Library in Tama Art University by Toyo Ito. (Source: [http://odalisquemagazine.com/blogs/mclahr], 2014)
Guidelines for designing
animal enclosures

Walls

Precast concrete walls can be appropriated
with a variety of possible treatments. All
paint needs to be non-toxic as animals
may ingest it. Certain animals rub against
the walls and in this case concrete will
be preferred to paint as a concrete stain
looks better than one on paint. Brick is
an inexpensive alternative but usually
requires plaster for easier cleaning.
Animals’ scent marks their enclosures
thus porous materials such as wood is
undesirable on lower levels of walls.
(Kleinman, Thompson & Baer, 2010:162)

Fencing

In ungulate enclosures the fencing should
be on the inner side of the structural posts
to avoid injury when the animal runs along
the fence. Animal strength should be
taken into consideration when choosing
fencing type and material. The height
requirements for ungulates should be 1.8
to 2.4m with an overhang inward of 90˚
or 45˚. Gates can be sliding or swinging.
(Kleinman, Thompson & Baer, 2010:162-163)

Floors

Drainage is the most important factor
when designing floors; a typical slope of
5% is needed for excess cleaning water
to drain properly. Floors should not be
smooth to avoid potentially dangerous
falls. A broom finish to the screed is
advisable. Cushioned flooring material
is state-of-the-art when designing floors.
(Kleinman, Thompson & Baer, 2010:163)
Architecture by animals

Animals are the architects and engineers of their own worlds. They build for shelter, attraction of mating partners, capturing food and for the function of metamorphosis. They often do so to the benefit of many other species such as the beaver dams that act as water sources for the entire ecosystem around them. Another interesting observation of animal designs is the attention to aesthetics, for example, the Volgekopgardner bower birds build mating nests and gather colourful items to lure a very scrupulous potential partner.
**Weaver**

Weaver birds build top hung hammock nests, usually built in the fork of two fine twigs. The male uses long strands to build a ring between these two twigs as well as an egg chamber to the one end and the entrance to the other. The egg chamber is fairly regular but loosely woven for ventilation. The male then changes material from long thin strips to short broad ones and lines the roof until very little daylight can enter, thus protecting it from rain.

**Beaver**

The beaver designs two distinct structures; a lodge to live in and a dam to create an artificial lake to store edible branches. The branches are packed loosely on parts of the roof of the lodge to allow for ventilation. (Hansell, 1984:21-22) The beaver dam must withstand its own weight as well as considerable lateral pressure acting on the upstream end. The upstream side is built up with sticks and twigs and sealed with mud. The downstream side is supported by larger buttresses or compression struts. (Ibid:135)

**Termite**

Mature termite colonies can build a 2 metre mound within 24 hours containing numerous design features. A thick wall perforated by vertical channels, surrounds a central dwelling cavity. The dwelling complex is composed of brood chambers, fungus gardens and a royal apartment. It stands on columns over a large basement cavity situated below ground level. The entire structure incorporates ingenious circulating air systems to regulate temperature, gas exchange and humidity. The heat gain in the dwelling causes air to rise, therefore drawing up cool, moist air from the basement. (Hansell, 1984:37)
<table>
<thead>
<tr>
<th>species</th>
<th>animal</th>
<th>name</th>
<th>size in m</th>
<th>weight in kg</th>
<th>life expectancy in years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Large carnivores</strong></td>
<td></td>
<td>lion panthera leo</td>
<td>1.7-2.3</td>
<td>120-250</td>
<td>12-16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tiger panthera tigris</td>
<td>1.4-2.8</td>
<td>100-300</td>
<td>8-10</td>
</tr>
<tr>
<td><strong>Antelope</strong></td>
<td>springbuck antidorcas marsupialis</td>
<td></td>
<td></td>
<td>30-48</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>giraffe giraffa camelopardalis</td>
<td></td>
<td></td>
<td>600-1900</td>
<td>25</td>
</tr>
<tr>
<td><strong>Primates</strong></td>
<td>gorilla gorilla gorilla gorilla</td>
<td></td>
<td></td>
<td>150-200</td>
<td>35-40</td>
</tr>
<tr>
<td></td>
<td>olive baboon padio anubis</td>
<td></td>
<td></td>
<td>22-37</td>
<td>30-45</td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td>cape fur seal arctocephallus pusillus</td>
<td></td>
<td></td>
<td>100-360</td>
<td>20-25</td>
</tr>
<tr>
<td></td>
<td>beaver (rodent) genus castor</td>
<td></td>
<td></td>
<td>18</td>
<td>5-7</td>
</tr>
<tr>
<td><strong>Avian</strong></td>
<td>african white backed vulture gyps africanus</td>
<td></td>
<td></td>
<td>4-7</td>
<td>unknown</td>
</tr>
<tr>
<td></td>
<td>bald eagle haliaeetus leucocephalus</td>
<td></td>
<td></td>
<td>3-6.5</td>
<td>20</td>
</tr>
<tr>
<td>life expectancy in years</td>
<td>suitable temporary enclosure</td>
<td>habitat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>captivity</td>
<td>area in m²</td>
<td>day &amp; night area</td>
<td>foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>14 day 15 night</td>
<td>completely enclosed for climbing species like jaguar night head height lower than day area</td>
<td>soft paw pad &amp; claws</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>14 day 15 night</td>
<td></td>
<td>soft paw pad &amp; claws</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>40 day 12 night</td>
<td>long narrow stretch to allow for run, high exterior fencing, certain buck can jump up to 4m high night head height higher exterior, fenced to shoulder height giraffes only sleep 10min to 2 hrs per 24hrs</td>
<td>hoof (ungulates)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>34 day 15 night</td>
<td></td>
<td>hoof (ungulates)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>24 day 15 night</td>
<td>night head height lower than day area</td>
<td>soft paw hand &amp; feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>15 day 14 night</td>
<td>completely enclosed due to escape risk</td>
<td>soft paw hand &amp; feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unknown</td>
<td>13 day 11 night</td>
<td>shallow pool in day area</td>
<td>fin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unknown</td>
<td>13 day 11 night</td>
<td></td>
<td>soft paw pad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>20</td>
<td>elevated from ngl and humans dowel stands</td>
<td>talon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>20</td>
<td></td>
<td>talon</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.3.3. Findings

Animal Matrix

In order to design for animals, a metric system, such as anthropometrics for humans, is needed to understand the scale and needs for the different species of the zoo. Such a system does not exist for zoo animals and was thus created from information gathered by existing zoo hospitals and animal databases.
2.3.4. Conclusion

Animal architecture is still an untapped field and most designs should be based on the advice from animal experts. For the purpose of temporary rehabilitation wards the emphasis be placed on hygiene, and then on enrichment.
Precedent studies

3.1. Snowdon aviary
3.2. Prahran hotel
3.3. Wellington zoo hospital
3.4. Oregon zoo veterinary medical centre
3.1. Project: Snowdon Aviary
Architect: Cedric Price & Lord Snowdon (Anthony Armstrong-Jones)
Client: Zoological Society of London
Completion: 1965

Aim

This precedent sheds light on the designing of large lightweight aviaries. It marked the start of the immersive enclosure design era and was technologically advanced for its time. The aim is to analyse the aviary in order to understand function, scale and public recreation.

Analysis

Lord Snowdon and Cedric Price were influenced by the design philosophy of Buckminster Fuller when they started designing this high technology aviary in 1960. The structure consists of four sets of aluminium tetrahedral tubes, balanced by two opposing tubular aluminium posts and framed by tensioned steel cables. Black mesh made of anodised aluminium netting drapes the framework to serve as a light perforated screen blurring the distinction between inside and outside. The aviary was designed to be a permanent structure and the form was derived from calculated engineering. The walkway is a double cantilever of pre-stressed concrete designed to give the visitor an immersed and unobscured view of the birds. (Snowdon Aviary London Zoo, Westminster. S.a.)

Application

• Due to the complex programme of the wildlife healthcare centre a form such as Snowdon Aviary would be too bold, and conflicting with the other forms of the building.

• The principles to apply are elevated walkways to get as close to the birds as possible and for the recreational aspect of immersive design.

• Aluminium poles in continuous tension can be a solution to the large scale of an aviary.

• Use se anodised aluminium netting as opposed to shading netted material to avoid maintenance issues and to keep the site secure from intruders.

Fig:36. Snowdon aviary 3D.
(Source: [http://imaginary-infrastructures.tumblr.com/post/:id/:summary], 2014)
(Edited: by author, 2014)

Fig:37. Snowdon aviary 3D.
(Source: [http://imaginary-infrastructures.tumblr.com/post/:id/:summary], 2014)

Fig:38. Snowdon aviary plan.
(Source: [http://imaginary-infrastructures.tumblr.com/post/:id/:summary], 2014)

Fig:39. Cedric Price.
(Source: [http://architecturelab.net/the-architectural-dreams-that-never-came-down-to-earth/], 2014)
Prahran Hotel
Aim

This precedent makes use of alternative materials and construction methods. Possible demolition of the existing hospital might provide re-usable materials for the new design and this prompts research into alternative use of building materials.

Analysis

The Prahran Hotel is a two storey pub in Melbourne recently refurbished to fit with the Art Deco facade. The interior includes a double volume space with a central courtyard. The stacked concrete pipes enables visitors to sit inside them and still interact with the view to the exterior as well as the interior courtyard. The courtyard cuts through the interior allowing natural lighting to both levels.

Application

• The circular shape could be used to emphasise the concept of termites creating cylinders and cells within their mounds.

• The function of the precast concrete pipes is to create intimacy and this could be used as an alternative to office cubicles.

• On the exterior plants and vegetables can be grown to feed the animals.

• Create a double volume on the interior to display the aesthetics from both interior and exterior.

• Employ this structure on the northern facade to diffuse light entering the building as a replacement for overhangs or louvers.
Wellington Zoo Hospital
3.3.
Project: Wellington Zoo Hospital (The Nest Te Kōhanga)
Architect: Warren and Mahoney
Client: Wellington Zoo Trust/ Wellington City Council
Completion: 2010
Location: Wellington, New Zealand.

Aim
This precedent houses a similar accommodation to the wildlife medical centre and will thus be analysed to inform the programmatic requirements of a zoo hospital. This precedent explores how zoo veterinary practices are displayed to the public.

Analysis
The Wellington Zoo recently acquired a state-of-the-art animal hospital. It is a single storey structure that for provides for staff facilities and areas for diagnostics, surgery, recovery and isolation. The form is derived from the site's contours and aesthetics derived from aged zinc, unpainted timber, and concrete have aged. The building is integrated with the landscaping in order to link the hospital with the whole zoo site. A concrete terrace with shelves, planters, stone and seats form the visitors path to the hospital. The public courtyard creates a non-intrusive platform for viewing. The zoo staff requirements included low maintenance materials and natural materials where possible, and energy efficiency, functional medical waste management and water conservation. (Wellington Zoo Hospital (The Nest Te Kōhanga) S.a.)

Application
• To emphasise conservation awareness include public involvement.
• Use the principle of landscaping as a visual guide for public interface.
• Medical waste management area to be enclosed and accessible to waste removal van from exterior as well as operating, examination and sterilising room from within the building.
• Consider roof incline to relate to contours of site
• Provide staff facilities such as a recreational area

Fig:44. Wellington zoo hospital surgery.
(Wellington Zoo Hospital (The Nest Te Kōhanga) S.a.)(Edited: by author, 2014)

Fig:45. Wellington zoo hospital.
(Wellington Zoo Hospital (The Nest Te Kōhanga) S.a.)

Fig:46. Wellington zoo hospital viewing area.
(Wellington Zoo Hospital (The Nest Te Kōhanga) S.a.)

Fig:47. Wellington zoo hospital elevation.
(Wellington Zoo Hospital (The Nest Te Kōhanga) S.a.)
Oregon zoo medical centre
Aim

This building’s function is synonymous with the intended wildlife medical centre. An in-depth analysis of its plans will assist in functional zoning and circulation decisions.

Analysis

The Oregon Zoo had a vet hospital designed to meet the 1970’s veterinary care standards and support behavioural research programmes of that time. Veterinary care has changed tremendously since then and the building outdated. Their new facility accommodates each animal’s specific needs in terms of comfort by designing species-specific wards and allowing for adaptable humidity, light and temperature. The primates for example, have perches and elevated beds. The wards were designed to promote healing, reduce stress and keep the animals calm. The new facility boasts an efficient floor plan that allows procedures with minimal movement of the animal. (Veterinary Medical Centre. S.a.)

Application

• This project has at least three animal drop-off zones, use less to avoid a facade of garage doors. Only separate drop off for quarantine animals.
• Follow average square metres to determine the scale needed for different species.
• Use principles of public to private gradient. Public-Private Animal-Human
• Introduce shared day enclosure spaces.
• Note animal alley at carnivore wards to chase animal into van, avoiding anaesthesia.
• The circulation and functional zoning principles are to be analysed and utilised.
Analysis and appraisal of context

4.1. National analysis
4.2. Regional analysis
4.3. Urban analysis
4.4. Neighbourhood
4.5. Site
Fig: 50. National Zoological Gardens.  
(Sketch and editing: by author, 2014)
4.1. National analysis

Before the analysis of the region a comparative analysis of other zoos in South Africa was compiled in order to understand the current state of zoo healthcare in the country. The NZG and Johannesburg Zoo are the only two zoos with hospitals on site, Bloemfontein Zoo and Mitchell Park Zoo make use of local private veterinarians when problems arise with a particular animal. Bloemfontein Zoo has facilities to hold sickly animals until the veterinarian can attend to it. Johannesburg Zoo, Bloemfontein Zoo and Mitchell Park Zoo are managed by the local municipalities and depend largely on the donations of other organisations. The white marks on the zoo maps indicate the relative zoo staff areas. These zoos exchange not only animals but also zookeepers. Harry Seakamela had, at the time of the interview, been transferred to Bloemfontein Zoo from the NZG. He is a snake expert and was called back to his previous workplace when the black mamba, nicknamed Houdini, escaped from its terrarium in 2013. He laughingly tells that the NZG thought he had suspiciously taken the snake to Bloemfontein because he admired it so. Undeterred he returned to Pretoria and found it under rubble behind one of the mammal enclosures.
<table>
<thead>
<tr>
<th></th>
<th>National Zoological Gardens</th>
<th>Johannesburg Zoo</th>
<th>Bloemfontein Zoo</th>
<th>Mitchell Park Zoo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case study</strong></td>
<td>Visited Jan-October 2014</td>
<td>Visited June 2014, Neighbouring zoo</td>
<td>Visited June 2014</td>
<td>Visited March 2014</td>
</tr>
<tr>
<td><strong>Date opened</strong></td>
<td>21 October 1899</td>
<td>1904</td>
<td>1906</td>
<td>Mid 1900’s</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>Pretoria, Gauteng</td>
<td>Johannesburg, Gauteng</td>
<td>Bloemfontein, Free State</td>
<td>Durban, Kwazulu Natal</td>
</tr>
<tr>
<td><strong>Area</strong></td>
<td>85 ha</td>
<td>55 ha</td>
<td>48 ha</td>
<td>15 ha</td>
</tr>
<tr>
<td><strong>Number of animals</strong></td>
<td>9000</td>
<td>2000</td>
<td>2000</td>
<td>400</td>
</tr>
<tr>
<td><strong>Number of species</strong></td>
<td>700</td>
<td>320</td>
<td>300</td>
<td>250</td>
</tr>
<tr>
<td><strong>Annual visitors</strong></td>
<td>600 000</td>
<td>400 000</td>
<td>100 000</td>
<td>20 000</td>
</tr>
<tr>
<td><strong>Veterinary facilities</strong></td>
<td>Husbandry Breeding Conservation Research Hospital</td>
<td>Husbandry Breeding Conservation Hospital (1936)</td>
<td>Husbandry Breeding Conservation</td>
<td>None</td>
</tr>
</tbody>
</table>

Table:5. Comparative analysis.
(Table and maps: by author, 2014)
4.2. Regional analysis

2014/15 Integrated Development Plan
Review of the City of Tshwane

On 27 August 2013 the Council approved the Tshwane Vision 2055 which is a long term strategic plan to improve the social, economic, and management of the natural environment. In this plan they address urbanisation and migration, economic development, job creation, service delivery, poverty, urban renewal and regeneration. City of Tshwane is 6345 square kilometre in size which makes it the third largest municipality in the world. (SA, 2014)

The long term vision of the City is as follows:

In 2055, Tshwane is liveable, resilient and inclusive whose citizens enjoy a high quality of life, have access to social, economic and enhanced political freedoms and where citizens are partners in the development of the African Capital City of excellence. (SA, 2014)

Transportation services

Due to urban sprawl, the majority of the poor are located far from economic opportunities. Construction of bus transportation, A Reyeng Rapid Transit System, started in 2013 and is aimed at providing reliable, convenient and safe public transport. A bus terminal will be situated near the NZG on Paul Kruger street. (SA, 2014)

The Gautrain bus also provides a stop on Boom Street with the inner CBD bus route; this is stop number 7.

Fig:51. Regional map of Tshwane. (SA, 2014)
Suburban density:
Existing suburban areas with the potential for moderate densification.
Areas to be developed with community service facilities in line with the City’s standards for service delivery. Maintenance of existing facilities are important.

Mix used/business areas:
Require high levels of investment and up-keeping. Public transport linkages are important. These areas service the community and provide job opportunities

Future urban development areas:
These areas will in future provide housing and business uses. Due to unavailability of services they need to be carefully managed and planned.

Rural:
Intention is to create vibrant, equitable and sustainable rural communities - providing food and work opportunities. Require provision of community services as well as economic infrastructure e.g. Roads to transport goods, water etc.

Industrial:
Require high levels of investment and up-keeping. Public transport linkages are important. These areas provide job opportunities for unskilled and semi-skilled workers

Fig:52. Map of Pretoria.
(SA, 2014)
To attract maximum tourism figures, zoos generally exist within metropolitan areas and are an irreplaceable natural commodity to society. The NZG’s 85ha can be compared to 15 city blocks which amount to about a quarter of Pretoria’s central business district.

Fig:53. Pretoria city skyline.  
(Photography: by author, 2014)
4.3. Urban analysis

Capital collective and cool capital

In addition to the City of Tshwane’s redevelopment plans, Pretoria is also undergoing rejuvenation initiatives by organisations such as ‘cool capital’ and capital collective. These are private initiatives aimed at encouraging public interaction with the objective of branding the city of Tshwane as a creative and exciting platform to share ideas and highlight economic opportunities. These projects are in beginning phases but if Warwick, Maboneng, Braamfontein and Newtown are precedents to South African city rejuvenation, then it is bound to be a success. Several projects have been integrated with the NZG such as the Molo Mollo film event and pinhole photography project held in the Transvaal museum and the open city walks which included NZG in the route.

Fig:54. Projects by Capital Collective.
(Source: [http://www.capitalcollective.co.za/welcome/], 2014)
4.4. Neighbourhood

The site is located on Boom Street on the northern edge of the CBD. Boom and Bloed Streets are notorious areas where muggings occur regularly due to urban decay, this was emphasised by the US embassy when they issued an advisory to their citizens to avoid visiting the zoo as it is not safe. Craig Allenby from the NZG’s marketing department responded promptly in a public statement that these allegations were false. Soon Radio Jacaranda got hold of the story and decided to broadcast their breakfast show at the zoo in support of clearing its reputation. They invited three American citizens along with them and received only positive feedback. In the mean time the City of Tshwane, the Tshwane Metro Police and the South African Police Service (SAPS) have increased patrols inside the zoo. The US embassy has since lifted its advisory. See Appendix A.

4.5. Site

Site selection

The exiting hospital will be demolished along with the bird cages to the east of the hospital as well as the ungulate wards north east of the hospital. The shortcomings of these buildings were explained in the introduction. The two existing parking lots will be demolished and replaced with landscaping and sufficient basement parking stretching from the existing parking to below the proposed building.

Site location

The site is located at:
232 Boom Street, Pretoria.

Topography and typology

A comparative analysis was compiled to determine an archetype of the buildings relevant to the site. The topography of the site slopes down from Boom Street in a northern direction towards the Apies river; a total fall of 3 meters over a distance of 100m.

Climate and geography

Summer solstic 87˚
Winter solstic 44˚
Summer rainfall 125 - 375mm
Winter rainfall 62 - 250mm
January temperatures 20 - 25°C
July temperatures 10 - 15˚
Relative Humidity 30 -50%
(Napier, 2000: 9-8)
Fig: 57. ‘Staatsmuseum’ (Museum of the State) 1904 (Oberholster, 1992)

Fig: 58. Map of zoo presented to visitors early 1900’s (Oberholster, 1992)

Fig: 60. Extensions complete in 1954 (Oberholster, 1992)

Fig: 61. Latest map to date. (Drawing: by author, 2014)
<table>
<thead>
<tr>
<th>Illustration</th>
<th>Function</th>
<th>Roof</th>
<th>Plan</th>
<th>Walls &amp; Windows</th>
</tr>
</thead>
<tbody>
<tr>
<td>State museum currently derelict</td>
<td>double pitched roof</td>
<td>8m cross ventilation courtyard</td>
<td>8m cross ventilation</td>
<td></td>
</tr>
<tr>
<td>Zoo admin</td>
<td>mono pitch roof parapet walls</td>
<td>2 winged central circulation</td>
<td>Parapet walls</td>
<td></td>
</tr>
<tr>
<td>Zoo entrance</td>
<td>double pitched roof</td>
<td>Rectangular</td>
<td>Brick and openings</td>
<td></td>
</tr>
<tr>
<td>Avian enclosures</td>
<td>Pitched roof with overhang</td>
<td>Stoop living area front of house</td>
<td>Interior walls corner windows</td>
<td></td>
</tr>
<tr>
<td>Previously zoo keeper houses to be renovated into laboratories</td>
<td>Hipped roof with overhang</td>
<td>12 to 14m cross ventilation rectangular shape</td>
<td>Coloured brick facade variety of window sizes placed symmetrical and asymmetrical</td>
<td></td>
</tr>
<tr>
<td>Staff centre and canteen</td>
<td>Pitched roof with overhang</td>
<td>Stoop entrance central circulation semi courtyard circulation areas exterior circulation to quarantine pathology and laboratories</td>
<td>Coloured brick facade variety of window sizes placed symmetrical and asymmetrical</td>
<td></td>
</tr>
<tr>
<td>Existing zoo hospital and laboratories</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(All Photography on page 65: by author, 2014)
Image of site after demolition works. The far left parking is to be demolished in phase two of the design. The parking on the left will become the ramp to the new basement parking. The hospital will be demolished and bricks reused for new wards and hospital. The wards on right are to be demolished and replaced by state-of-the-art wards.
Brief, programme & accommodation

5.1. Brief
5.2. Accommodation schedule and relationships between spaces.
5.3. Measures to achieve sustainability
5.4. Design criteria
5.1. Brief

Aesthetic and functional requirements

The design aesthetic requires an environmental response combined with the regulated requirements of the building type. The public interface needs to inspire and educate the zoo visitors. The functions can be categorised into three parts, the Bio-bank; the research laboratories; and lastly the zoo hospital and wards. The Bio-bank requires cold storage capacity and access by veterinarians and researchers. The laboratories require work space office space as well as private and public access. The zoo hospital needs numerous procedure rooms, rooms servicing these and rehabilitation space.

Contextual response

The study of the typology of the context presented common denominators such as courtyard spaces, brick as major building material and pitched roofs. Residential houses make up most of the direct context on the eastern and northern sides of the site. The major response to context is required on the southern facade of the design along Boom Street. The existing situation is the 5m flat facade of Bloed Street Mall facing the boundary wall of the zoo staff area. This creates an alley with no regard for the many pedestrians making use of the taxi rank at the mall parking. An inclusive response to Boom street is imperative.

Type of services

The services associated with the medical centre include:

- loading and off-loading of live and dead animals;
- waste removal including regulated medical waste;
- delivery of supplies and fresh produce;
- the laboratories need special extractor ventilation for the lamina flow cupboards; and
- temperature control is required for the different species wards.

Recovery wards are used for the following:

- introducing a new animal to zoo;
- temporary storage and quarantine for animals from OR Thambo airport;
- temporary storage due to zoo overcrowding (specifically birds);
- quarantine to separate sick animals from zoo enclosures;
- temporary holding for routine checkups or pedicures;
- recovery or rehabilitation from surgery.
<table>
<thead>
<tr>
<th>Accommodation schedule</th>
<th>Relationships between spaces &amp; general notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospital</strong></td>
<td></td>
</tr>
<tr>
<td>Staff area</td>
<td>Offices, 4-6 veterinarians, veterinary assistant station (staff room), 2 animal attendants</td>
</tr>
<tr>
<td>Administration (no reception area)</td>
<td>Close to drop-off and entrance</td>
</tr>
<tr>
<td>Toilets</td>
<td>Central to offices</td>
</tr>
<tr>
<td>Pharmacy (close to examination room)</td>
<td>Close to examination room</td>
</tr>
<tr>
<td>Sterilising room (non-sterile environment)</td>
<td>Away from sterile surgery room.</td>
</tr>
<tr>
<td>Walk in safe for fire arms, dart guns, controlled drugs</td>
<td>Place in pharmacy for control regulation.</td>
</tr>
<tr>
<td>Procedures areas</td>
<td></td>
</tr>
<tr>
<td>X-ray room and x-ray viewing area</td>
<td>No developing room due to digital technology</td>
</tr>
<tr>
<td>Examination/consulting room</td>
<td>Direct access to drop-off</td>
</tr>
<tr>
<td>Scrub area</td>
<td>Direct access to drop-off</td>
</tr>
<tr>
<td>Operating theatre</td>
<td>Between sterile and non-sterile spaces</td>
</tr>
<tr>
<td>Pathology area</td>
<td>Access for public viewing</td>
</tr>
<tr>
<td>Scrub area and sterilising threshold</td>
<td>Foot bath</td>
</tr>
<tr>
<td>Post-mortem examination room - public viewing optional to non-sensitive situations</td>
<td>Access for public viewing optional</td>
</tr>
<tr>
<td>Walk in freezer (6x3m)</td>
<td>Direct access to drop-off</td>
</tr>
<tr>
<td><strong>Wards</strong></td>
<td></td>
</tr>
<tr>
<td>Staff</td>
<td>Kitchen to prepare food for animals in wards</td>
</tr>
<tr>
<td>Intensive Care Unit (ICU)</td>
<td>In hospital staff area</td>
</tr>
<tr>
<td>Temporary rehabilitation enclosures</td>
<td></td>
</tr>
<tr>
<td>• Aquatic</td>
<td></td>
</tr>
<tr>
<td>• Avian</td>
<td></td>
</tr>
<tr>
<td>• Primates/ Carnivores</td>
<td></td>
</tr>
<tr>
<td>• Antelope</td>
<td></td>
</tr>
<tr>
<td>• Multi-purpose large animal</td>
<td></td>
</tr>
<tr>
<td>Quarantine area (indoor - shower for attendants - separate from hospital and zoo)</td>
<td>Seperate from all other facilities.</td>
</tr>
<tr>
<td><strong>Laboratories</strong></td>
<td></td>
</tr>
<tr>
<td>Staff</td>
<td>Offices (3x PhD students sharing + 3 Researchers)</td>
</tr>
<tr>
<td>Clinical Pathology</td>
<td></td>
</tr>
<tr>
<td>Parasitology</td>
<td></td>
</tr>
<tr>
<td>Endocrinology</td>
<td></td>
</tr>
<tr>
<td>Reproduction Biology</td>
<td></td>
</tr>
<tr>
<td>Genetics</td>
<td></td>
</tr>
<tr>
<td>DNA, PCR, Sequencing</td>
<td>Access for public viewing</td>
</tr>
<tr>
<td><strong>Bio bank</strong></td>
<td></td>
</tr>
<tr>
<td>Staff</td>
<td></td>
</tr>
<tr>
<td>Office Repository (the central location in which data is stored and managed)</td>
<td></td>
</tr>
<tr>
<td>Dirty processing (processing of incoming samples)</td>
<td></td>
</tr>
<tr>
<td>Dispatch (storage of sample kits)</td>
<td></td>
</tr>
<tr>
<td>Room temperature</td>
<td>Accessible from Dirty processing room</td>
</tr>
<tr>
<td>4˚ to -20˚ fridges</td>
<td>Accessible from Dirty processing room</td>
</tr>
<tr>
<td>-80˚ to -150˚ fridges</td>
<td>Accessible from Dirty processing room</td>
</tr>
<tr>
<td>Liquid nitrogen storage</td>
<td>Accessible from Dirty processing room</td>
</tr>
<tr>
<td>Walk in freezer</td>
<td>Accessible from Dirty processing room</td>
</tr>
</tbody>
</table>

Table 6: Accommodation schedule and relationships between spaces.
(Table: by author, 2014)
5.3. Measures to achieve sustainability.

The building needs to be designed to compensate for future growth and expansion.

Natural lighting and solar power storage for backup electricity.

Orientation to face north to avoid solar heat gain.

Rain water harvesting and storage.

Vegetable gardens in eastern concrete pipes for animal feeding.

Natural ventilation where possible as certain animals require regulated temperatures.
<table>
<thead>
<tr>
<th>No.</th>
<th>Design criteria</th>
<th>Criteria in conflict</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Design humane rehabilitation wards.</td>
<td>Hygiene is more important than enrichment in this case.</td>
<td>Design wards with cleanable floors and use the ceiling space to 'naturalise' the ward.</td>
</tr>
<tr>
<td>2</td>
<td>Design space for part time students to use on occasion.</td>
<td>Mixed use areas take up unnecessary space when vacant.</td>
<td>Precast concrete pipes provide the dual function of study carrels and diffusion of northern sunlight.</td>
</tr>
<tr>
<td>3</td>
<td>Design public viewing of surgery and laboratory operations.</td>
<td>Public access can hinder daily operations of the medical centre.</td>
<td>Create a public walkway on first floor level and access to exterior viewing area of procedure rooms.</td>
</tr>
<tr>
<td>4</td>
<td>Design a facility that positively changes public views on conservation.</td>
<td>The site is located on the most eastern end of the staff area which is preferably not accessible to public.</td>
<td>Design a tree top canopy walkway from the proposed renovated museum to the medical centre on a new education route.</td>
</tr>
<tr>
<td>5</td>
<td>Design an environment for quick recovery of sick animals.</td>
<td>Bustling Boom Street lies adjacent to site.</td>
<td>Design the human inhabited spaces between the street and the wards as a noise buffer.</td>
</tr>
<tr>
<td>6</td>
<td>West facing aviary is unavoidable.</td>
<td>Direct sunlight disrupted by glare.</td>
<td>Green screen is used to shade the inner core of aviary.</td>
</tr>
<tr>
<td>7</td>
<td>Cross ventilation is imperative.</td>
<td>Numerous spaces designed within the 12m space.</td>
<td>Place internal windows and louvres at offices and laboratories.</td>
</tr>
<tr>
<td>8</td>
<td>The building needs to be designed to compensate for future growth and expansion.</td>
<td>Additions can become complicated.</td>
<td>Extra passage spaces can be renovated into offices. Wards are spaciously designed over site to allow for additions.</td>
</tr>
<tr>
<td>9</td>
<td>Integrate aviary and building.</td>
<td>Birds could enter building.</td>
<td>Two door system used when entering and exiting aviary.</td>
</tr>
</tbody>
</table>

Table: 7. Design criteria.  
(Table: by author, 2014)
chapter 6
Design concept development

6.1. Concept
6.2. Design development
Fig: 64. Initial concept sketch.
(Sketch: by author, 2014)
6.1. Concept

The concept is derived from the study of animal architecture. Certain ideas and principles were drawn from three examples of animals and how they ‘design’ their structures. The weaver displays precision threading with limited length materials. It constructs from a branch in tension and avoids predators. The beaver portrays an ability to sustain its environment and constructs compressive dams with effective waterproofing. The termite emanates genius with fully functional temperature and air control systems.

(Photography & models: by author, 2014)

(Source: [http://able.wiki.up.ac.za/index.php/House_Laubscher_(341_Brooklyn_Road,_Pretoria], 2014)

(Source: [http://imaginary-infrastructures.tumblr.com/post/:id/:summary], 2014)

(Snowdon aviary)

(Prahran Hotel I & II S.a.)

(Pahran Hotel)

(Hansell, 1984)
6.2. Design development

Initial design and site choice closer to museum.

Fig:65. Initial zoning sketches with site closer to the museum.
(Sketch: by author, 2014)
Fig:66-69. Initial models with site closer to the museum.
(Models & Photography: by author, 2014)
Fig: 70-77. Models of possible massing on site. Model below chosen for final massing. (Models & Photography: by author, 2014)
Fig:78. Design decision making generators, final poster. (Sketches: by author, 2014)
Site selection & zoning process

Original design closer to museum causing problems with staff entrance.

Entrance from eastern residential area, idea not selected.

Ring road around design as new staff entrance, idea not selected.

Final site selection

Original site required too many buildings to be demolished.

Development of new site

Context

courtyard spaces

residential context

public roads
Fig: 79. Final presentation posters
(Sketches: by author, 2014)
Fig: 80. Final presentation posters
(Sketches: by author, 2014)
Fig:81. Final presentation posters
(Sketches: by author, 2014)
Chapter 7
Design presentation
The design aesthetic is a response to both: the ‘natural and environmental’ stigma attached to designing for animals as well as the ‘formal and regulated’ needs of the programme. The hospital and wards are a combination of cast in-situ concrete and brick walls for exterior articulation. The interior provides the option of plaster and paint in the hospital and ICU units as well as the option of truncated rough timber interior cladding for the wards. Some flat concrete roofs have overhangs and others parapet walls. The roofs here are semi-accessible green roofs. These materials warrant low maintenance and cost efficiency. The staff building responds to Boom Street in a palimpsest of interior activity. It is a lightweight structure comprising of steel columns, precast concrete floor slabs and composite material walls.
First floor.

Second floor.
1. Pathology room and freezer.
2. Surgery room.
3. X-ray and viewing.
4. Public viewing.
5. Pharmacy.
7. Gun safe.
8. Waste.
9. Storage and generator room.
10. ICU ward, large and small animals.
11. Store room.
12. Carnivore/ primate ward.
13. Large animal ward.
14. Aquatic ward.
15. Fresh and salt water pools.
16. Administration.
17. Veterinarian office.
18. PhD study carrel.
20. Store room.
21. Staff room and kitchenette.
22. Animal pantry.
23. Animal kitchen.
1. Clinical pathology laboratory.
2. Parasitology laboratory.
3. Reproductive biology laboratory.
4. Endocrinology laboratory.
5. Genetics laboratory.
6. DNA and Sequencing laboratory.
7. PhD study carrel.
8. Laboratory administration.
9. Researcher office.
10. Entrance to aviary.
First floor.
2. Dirty processing.
3. Dispatch.
4. Repository.
5. Office space.
Second floor.
View from Boom Street.
View from public walkway.
View from Boom Street.
Aerial view from south.
View from inside northern aviary.
Fig: 82. Final presentation from left: Pieter Greyventstein, Christo Vosloo, Riette Kotze, Heleine Nienaber, Dr Jaco Wasserfall and author.  
(Photography: by Nicole Lloyd-Lister, 2014) 
(Edited: by author, 2015)
Fig:83-85. Final presentation concept models.
(Photography: by Nicole Lloyd-Lister, 2014)
(Edited: by author, 2015)
Technical review
Technical review.

The building makes use of a heavy substructure whereby the semi-basement is made up of concrete floors and columns. The ground floor of the northern part continues this heavy structure with brick and concrete walls and concrete roofs. The lightweight superstructure of the staff area makes use of steel columns, precast pipes and precast concrete floor slabs. Magnesiacore, a non-combustible composite material, is used as walling on interiors and exteriors. Brick diaphragm walls penetrate through the first floor to allow for specialised extracting fans, service ducts and storage space. Fire escapes are semi exterior spaces with green wall screens.
Ground floor plan.
First floor plan.
Second floor plan.
50mm x 38mm SA PINE Purlins at 1200mm c-c spacing max
4000mm x 100-125mm Ø SALIGNA Gum Pole
17.5mm profile depth POLYCARBONATE roof sheeting

5500mm x 150-175mm Ø SALIGNA Gum Pole
305mm x 305mm x 21mm (flange) X 14mm (web) MILD STEEL H-Column
303mm x 165mm x 10mm (flange) X 6mm (web) MILD STEEL universal beam
110mm x 220mm x 75mm MASONRY brick upstand
DERBIGUM SP torched upper layer waterproofing
Rigid ROFYCOM RE edge profile drip
to min fall 1:100

Cant strip chamfer
DERBIGUM S cold applied waterproofing

303mm x 305mm x 21mm (flange) X 14mm (web) MILD STEEL H-Column
303mm x 165mm x 10mm (flange) X 6mm (web) MILD STEEL universal beam
110mm x 220mm x 75mm MASONRY brick upstand
DERBIGUM SP torched upper layer waterproofing

305mm x 305mm x 21mm (flange) X 14mm (web) MILD STEEL H-Column
303mm x 165mm x 10mm (flange) X 6mm (web) MILD STEEL universal beam
110mm x 220mm x 75mm MASONRY brick upstand
DERBIGUM SP torched upper layer waterproofing
Rigid ROFYCOM RE edge profile drip
to min fall 1:100

305mm x 305mm x 21mm (flange) X 14mm (web) MILD STEEL H-Column
303mm x 165mm x 10mm (flange) X 6mm (web) MILD STEEL universal beam
110mm x 220mm x 75mm MASONRY brick upstand
DERBIGUM SP torched upper layer waterproofing
Rigid ROFYCOM RE edge profile drip
to min fall 1:100

305mm x 305mm x 21mm (flange) X 14mm (web) MILD STEEL H-Column
303mm x 165mm x 10mm (flange) X 6mm (web) MILD STEEL universal beam
110mm x 220mm x 75mm MASONRY brick upstand
DERBIGUM SP torched upper layer waterproofing
Rigid ROFYCOM RE edge profile drip
to min fall 1:100
Roof and floor explosion.
Zoo Medical centre at the NZG

Drawing Description:

Yellow- Brick
Green- Structural mild steel
Grey- Expanded metal mesh
White horizontal- Concrete
White vertical- Magnesia core panels
Conclusion
Self assessment and conclusion.

The proposed design managed to adhere to functional requirements, energy efficiency requirements, northern orientation and cross-ventilation. The proposed building uplifts the genius loci of the staff area as well as Boom Street.

The scale of the building demands attention from Boom Street and grades lower towards the northern surrounding residential buildings. The porous green aviary connects to the public boulevard offering an experience of the birds and awareness of conservation by viewing the laboratories from the street.

The building symbolises innovation through its public inclusion of areas such as the laboratories, radiology and surgery. It educates the zoo visitors with regards to conservation whilst allowing the staff to be unhindered.

The building fulfils all the requirements that were present in the existing building. It amalgamates all the medical structures of the NZG in order to function more efficiently.

The general feel of the staff area is very robust, with paved and brick horizontal and vertical surfaces. In retrospect I would have redesigned the landscaping for connectivity between all buildings in the staff area if more time was available. The removal of the ground floor parking was a step in that direction.
Acknowledgements

I sincerely thank my father, mother and sister for their continued love and support during my studies. I could not have done this without you.

I wish to express gratitude and appreciation to my mentors Pieter Greyvensteyn and Prof. Jacques Laubscher for their inspiration and guidance.

I would like to acknowledge the staff and students at the Department of Architecture for their input and spirit throughout the process.

Thank you to TUT for the financial assistance provided.

Finally, I would like to thank my Maker for presenting me with endless opportunities.


GRAAFLAND, A. 2010. Understanding the socius through creative mapping techniques. The Netherlands: DSD.


Employees Advised to Avoid Pretoria Zoo, September 11, 2014
2 messages

Bryan Hernandez <bryan4887@gmail.com>
To: Nadia Lloyd-Lister <nlloydlisterner@gmail.com>
Fri, Sep 12, 2014 at 1:49 AM

Coulda been the cheeeetah zoo!

-------- Forwarded message --------
From: <acsjohannesburg@state.gov>
Date: Thursday, September 11, 2014
To: bryan4887@gmail.com

U.S. Diplomatic Mission to South Africa

Security Message for U.S. Citizens:

Recent Armed Robberies of Visitors to Pretoria Zoo

September 11, 2014

The U.S. Diplomatic Mission to South Africa urges U.S. citizens to be vigilant in protecting themselves from violent crimes in South Africa. There have been a number of armed robberies committed recently against visitors to the Pretoria Zoo. Due to these events, the U.S. Diplomatic Mission to South Africa advises U.S. citizens to avoid visiting the Pretoria Zoo until the security situation at the zoo improves.

Criminal activity such as assault, armed robbery, and theft, can be particularly high in areas around hotels, tourist attractions, and public transportation centers, especially in major cities. Review your personal security plans; remain aware of your surroundings, and maintain a high level of vigilance and take appropriate steps to enhance your personal security.
Dear Dr. Tordiffe

Could you please pass this on to whom it may concern.

An American friend forwarded it to me. Can't be good for tourism.

---

U.S. Diplomatic Mission to South Africa

Security Message for U.S. Citizens

Recent Armed Robberies of Visitors to South Africa

September 11, 2014

The U.S. Diplomatic Mission to South Africa urges U.S. citizens to be vigilant in protecting themselves from violent crimes in South Africa. Due to these events, the U.S. Diplomatic Mission to South Africa advises U.S. citizens to avoid visiting the Pretoria Zoo until the security situation improves. Criminal activity such as assault, armed robbery, and theft, can be particularly high in areas around hotels, tourist attractions, and public surroundings, and maintain a high level of vigilance and take appropriate steps to enhance your personal security.

We strongly recommend that U.S. citizens traveling to or residing in South Africa enroll in the Department of State’s Smart Traveler Enrollment Program, which makes it easier for the U.S. embassy or nearest U.S. consulate to contact you in an emergency. If you don’t have Internet access, enroll by phone or in person.

Regularly monitor the State Department’s website, where you can find current Travel Warnings, Travel Alerts, and the Worldwide Caution “Traveler’s Checklist” on the State Department’s website.

Contact the U.S. embassy or consulate for up-to-date information on travel restrictions. You can also call 1-888-407-4747 toll-free in the U.S. and Canada, 24 hours a day, 7 days a week. If you are a U.S. citizen who is abroad on an emergency travel issue, call 1-202-501-4444 or 1-888-407-4744 (toll-free in the U.S. and Canada).

Follow us on Twitter and Facebook to have travel information sent directly to your mobile device.

---
THE NATIONAL ZOO STILL A SAFE PLACE TO VISIT

14 September 2014

The National Zoological Gardens of South Africa, in Pretoria, has noted with deep concern the advisory that was issued by the US Embassy in Pretoria on Thursday last week regarding visitor safety at the Zoo.

The advisory stated that the Embassy advises all its citizens to avoid visiting the Zoo due to a variety of crimes that have allegedly taken place until such time as the Zoo rectifies the matter.

The Marketing Manager of the Zoo, Craig Allenby, says it is unfortunate that the Zoo has been singled out regarding crime. “We are aware of two cases of crime-related incidents involving visitors outside the Zoo and all measures are in place to avoid any further possible incidents”.

The National Zoo takes the safety of its visitors very seriously and has been in constant contact with the various law enforcement agencies, such as the South African Police Services and the City of Tshwane’s Metropolitan Police, who have the mandate and authority to deal with crime. In response to this, both agencies, who also appreciate the gravity of the situation, have increased their activities and visible presence in the area. The entire Tshwane City CBD is also under constant CCTV camera surveillance, and this includes the area around the National Zoo.

The National Zoo has safe parking for its visitors and its visitors can relax in a safe environment within the zoo. The National Zoo has security staff who patrol the zoo to ensure the safety of both its animal collection and visitors. However, the National Zoo does caution visitors to be vigilant with their belongings as you would anywhere in the world.

ISSUED BY: CRAIG ALLENBY

TEL: 012 339 2770 / 071 400 7588

E-MAIL: craig@nzg.ac.za
Mission to #SaveOurZoo accomplished

26 September 2014 at 13:01 by Bronwyn Hardick - The Complimentary Breakfast team set out on a mission to help improve the safety and security of the area’s surrounding zoo. The mayor of Tshwane commits to a plan and Americans prove embassy wrong! Podcast and pics here!

Recent statements made by the US embassy warning its citizens touring or living in South Africa who planned to visit the National Zoological Gardens of South Africa (Pretoria Zoo) to rather not due to huge security concerns had left the heritage site in a very grim light.

The Complimentary Breakfast team set out on a mission to change this perception by putting a plan together that will help improve the safety and security of the area’s surrounding the zoo and ultimately, #SaveOurZoo.

They first spoke to Craig Allenby, the National spokesperson for the Zoological Gardens about the embassy’s statements and found out the the security within the zoo walls is not where the problem lies, but in the areas surrounding the zoo. Retired SAPS specialist Bushie Engelbrecht was then contacted and requested to do a full risk analysis on the area surrounding the zoo.

He made his recommendations which were passed on to Kgosiientso Ramokgopa, the mayor of Tshwane,

This is what happened at the live broadcast from the zoo this morning:
US EMBASSY ISSUES A POSITIVE NOTICE ABOUT THE NZG

14 October 2014

The US Diplomatic Mission to South Africa has issued an updated travel advisory to its citizens regarding their possible visits to the NZG, in Pretoria.

The advisory stated that the Embassy has noted that "the City of Tshwane and the Tshwane Metro Police [and the SAPS] have increased uniformed and non-uniformed police patrols inside the zoo". It also stated that in view of the security updates it has lifted its caution on Americans visiting the NZG.

The announcement requested that all US citizens make use of the zoo’s official parking facilities and avoid any “street car guards” who are not employed by the zoo.

In response, the Manager of Commercial Services and Business Development, Craig Allenby says that all the concerted efforts between the NZG, the City, the Metro Police and the South African Police Service, have yielded a great deal of fruit. “We have managed to rid the area of illegal hawkers and street vendors with the aim of creating a more appealing first impression of the zoo. The City’s Metropolitan Police and the SAPS have given their assurance of their continued presence in the area and this was particularly evident on Heritage Day when there were more than 5 000 visitors at the zoo. No incidents of crime have since been reported”.

ISSUED BY: ANGELINE SCHWAN

TEL: 012 339 2705 / 079 998 7715

E-MAIL: angeline@nzg.ac.za