





URBAN GRAFT

RESTORATIVE URBAN GARDENS AND SOCIAL JUSTICE HUB IN
KING'S PARK BLOEMFONTEIN

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Author	Louis Wessels, 2014037820
Lecturers	Prof J Smit, Mrs P Smit
Supervisors	Prof G Bosman, Ms A Wagener
Date	8 October 2019

DECLARATION

Declaration of original authorship

The work contained in this dissertation has not been previously submitted to meet requirements for an award at this or any other higher education institution.

To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made.

Acknowledgement of editorial, proof-reading:

The work contained in this dissertation has been submitted for copy editing to:
Prof G Bosman & Ms Wanda Verster



ABSTRACT

The concept of social justice is understood as a fair relationship between the individual and society, measured by the distribution of wealth, opportunities for personal activity and social privileges (Kitching 2001: 3–10).

The central precinct of Bloemfontein, King's Park, does not adhere to these general measurements and is in a state of decay. The site has lost its significance as an integral part of the city over time. Historically the interpretation of these aspects can be viewed as the public Zoo and Rose Garden. This has come to be an outdated iteration, because the use of cages has become a socially questionable practice that is viewed as inhumane and cruel to its inhabitants.

This dissertation aims to introduce a contemporary interpretation of nature within the city in a more contemporary, updated and socially acceptable manner. Through the use of public gardens accompanied by a programme of facilities that caters to the general public, the project offers a lost part of the city back to the public. The park's derelict state is in dire need of conversion of a semi-exclusive space to an inclusive public space.

This will be achieved by using the four social justice aspects in conjunction with a social hub to re-integrate the contemporary re-interpretation into the site of King's Park. The result will be an effective and appropriate ensemble that aims to reflect the justification of its social status. By transforming the site into a structure of service to the community, it will relate to the public. This intervention should function as a graft where the existing park is the original 'plant' and the design proposal is a shoot or twig acting as a graft for new urban growth.

KEYWORDS: public participation, urban green space, urban ecology, well-being, public health, environmental ethics, social justice

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PART 1:

ORIENTATION



Figure 1 orientation graphic
(Author, 2019)



3

Figure 2 Bloemfontein Zoo (Author, 2018)

PART 1: ORIENTATION

Chapter 1, Introduction

1.1 Project Rationale

Concepts regarding the re-interpretation of ecological principles and linking the process of uncovering the layers of the site, will be investigated. This will help to establish a guideline that will serve as a structure of the research on the implementation of a social justice hub in King's Park Bloemfontein.

King's Park and the Bloemfontein Zoo is the identified site for the proposed re-development to public space. This proposal aims to activate public participation. The park is in a state of disrepair and does not accommodate public engagement within its boundaries. A reconciliation between the city (urban) and the park (nature) is proposed.

The existing footprint of the context has the potential of providing spaces that express the principles of environmental ethics through social justice. This proposed design will express a new meaningful place by exposing the existing layers of the site in addition to new facilitation of public space and previously semi-public space (the old municipal zoo). It is important to understand the history of the site, its functional role in the city, as well as a meaningful place over the decades to the residents of Bloemfontein.

1.2 Project background



Figure 3 Aerial photograph of the park 1936 (Auret 2019: slide 82)

“ The most striking revelation of the 1936 map/aerial photograph is the opulence and formal rigour of the gardens. From the splendour that King's Park must have been to the various institutional and private gardens, Bloemfontein was interspersed with a wide array of geometrically organised botanical wonder. However, there is also a more sinister absence which stands as accuser against this imperious way of enforcing order (Auret 2017: 205).

”

The park functioned throughout the history of Bloemfontein as a public space from the late 1800's, during the 20th century to our present-day (Schoeman, 1980: 258). It came to symbolize nature within the urban fabric of Bloemfontein. The site played an integral part in the system of the city, allowing its residents to take a break from the noise of everyday life through the park and its attractions (Schoeman, 1980: 303). In its current state of disrepair and neglect there exists no consideration for the area as it is left to a parsimonious state of preservation, causing an injustice to the meaning and possibility in the potential of the site.

The slow deterioration of the park can be seen through an array of 'snapshots' found in various books and articles about the city. These instances in time will be addressed throughout the document. There exists an evident stain of the discourse of time upon Bloemfontein, specifically the Rose Garden and King's Park. Figure 3 shows a clear image of what the garden and park once were, as ordered arrays of ornamental beauty. The rigour and splendour of King's Park and its facilitation to the residents of the city slowly gave way and the passage of time became detrimental to the state of the park (Auret 2015: 205). The decay and partial loss of this space as an integral part of the character of Bloemfontein as the City of Roses is of great concern, which forms the main investigation and problem that the design proposal seeks to solve.



Figure 4 Axis Line through Bloemfontein(Author, 2019)

1.3 Project approach

The new hub proposal will form part of the ensemble of the precinct and provides an opportunity to restore what was lost over time. Figure 5 illustrates the most direct differences on the site between 1936 and 2018. The Rose Garden and its radial layout barely survived through the 80 years from its inception to the current state. Only one fountain remains (green circle), the skeleton of the layout can still be seen in the form of King's way (yellow line) and the three fountains forming a central axis that leads through Bloemfontein (green line). Illustrated in Figure 4, the green line creates a central axis along three historically significant places can be found, namely the University of the Free State, King's Park and Hoffman square this street was a railway station originally and an extension of King's Way (Auret, 2015: 204).

This dissertation aims to address the functionality of a re-interpretation of nature within an urban park while elevating the site as an inclusive place for dialogue that provides an opportunity for social justice.

By changing the current function the site facilitates, to that of a social justice hub, the proposal schema will be open to the public. Different approaches are investigated to provide functional facilitation to accommodate the concept of social justice.

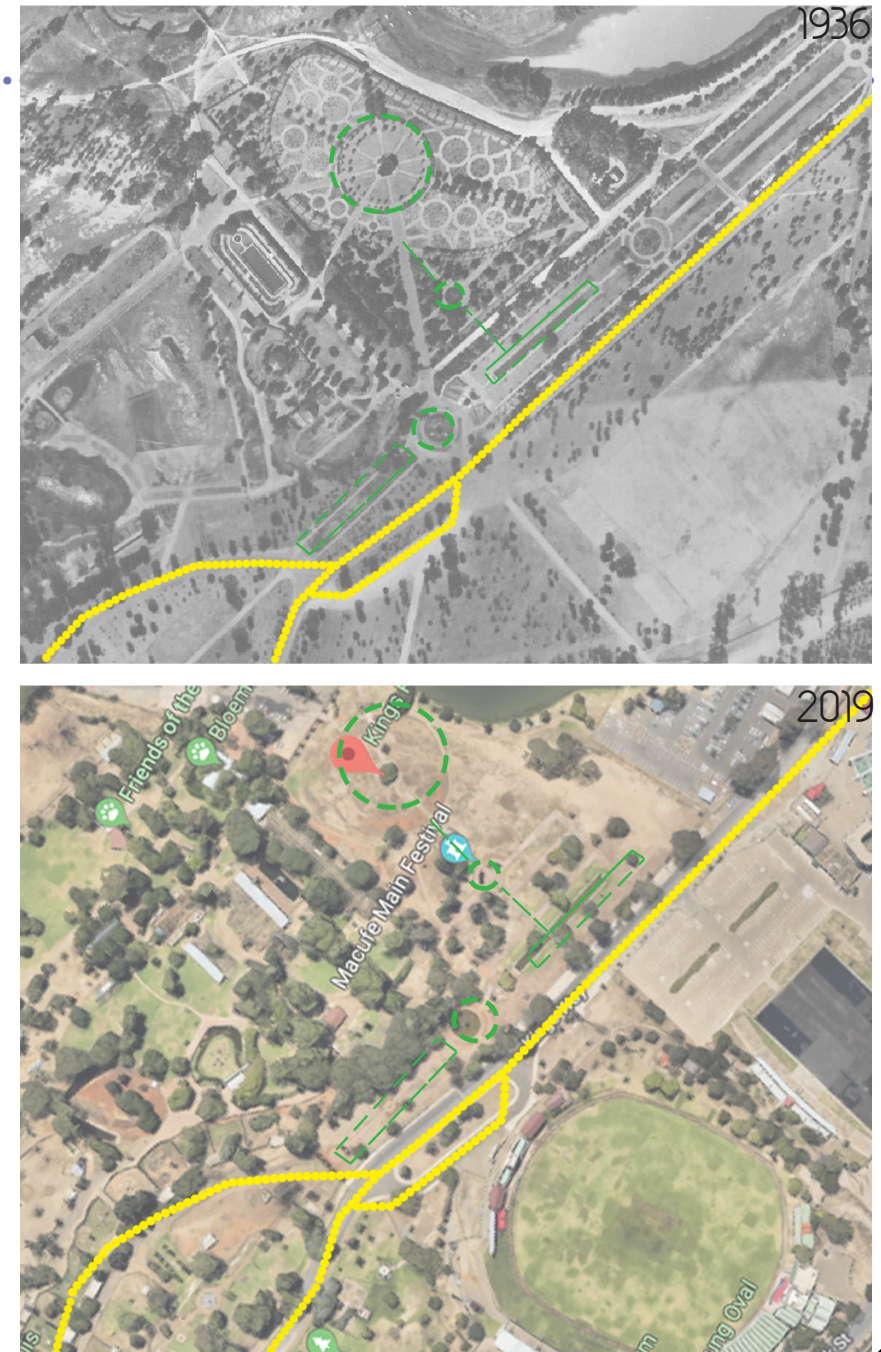


Figure 5 , Aerial view 1935 and 2019(Author, 2019)

Chapter 2 This chapter discusses the architectural challenges arising from an examination of the client, the brief and the site, and outlines a unique approach to address them.

Project consideration and Architectural challenges

2.1 Client

The client body for the social justice hub intervention in King's Park arises from a collaboration between the Mangaung Metropolitan Municipality and the South African National Biodiversity Institute.

The Mangaung Metropolitan Municipality aims to make a positive impact on the state of King's Park and enlisted the help of SANBI to aid in the regeneration of the decaying state of the park. The decision was influenced by the acceptance of the fact that the park needs to be reinstated to its potential as a place of social development, SANBI provides the ability to facilitate an appropriate direction to achieve the goals of the municipality.

The main aim is to re-introduce the park back to the city. This is done by appropriating the site in terms social justice principles. The principles can be described as: Access, Equity, Rights and Participation. Figure 6, illustrates the initial thought process behind the four principles and the inter-relationship needed to achieve these four aspects. Rights and Participation were identified as step one and Access and Equity as step two. Step two will be facilitated through the provision of step one, in attempt to achieve social justice. Provision of step 1 through the facilitation of step 2 to achieve social justice. The design proposal aims to incorporate these aspects into the site into a functional programme that allow the public to interact with the site again, but now in relation to these principles.



Mangaung Metropolitan Municipality which governs Bloemfontein and surrounding towns in the Free State province of South Africa. Mangaung is a Sesotho name meaning "place of Cheetahs." The metropolitan municipality has the mandate to commission the design and development of this project proposal. (Buffalo City, 2011, online).



The South African National Biodiversity Institute (SANBI) contributes to South Africa's sustainable development by facilitating access to biodiversity data, generating information and knowledge, building capacity, providing policy advice, showcasing and conserving biodiversity in its national botanical and zoological garden (SANBI, 2019).

The planned ensemble will aim to re-appropriate the derelict site of the Bloemfontein Zoo/Rose Garden from a semi-exclusive public space into a more inclusive public space. It is crucial to revive the historical significance of the site into a culturally and socially updated and relevant 21st century interpretation of its previous function.

Architectural Challenges:

A community orientated municipal ensemble is required which accommodates the public in an inclusive and participatory manner.

SOCIAL JUSTICE

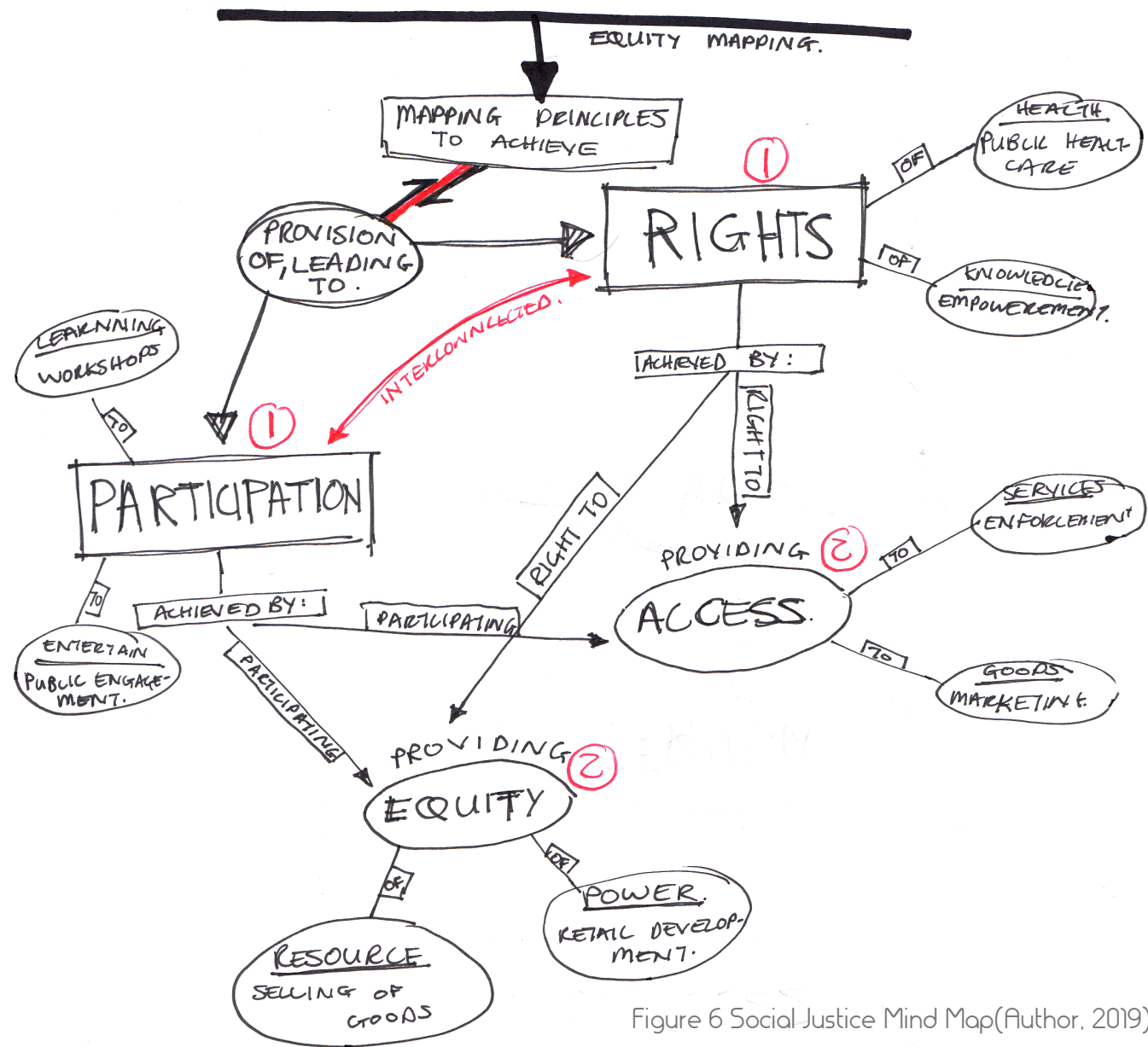


Figure 6 Social Justice Mind Map (Author, 2019)

2.2 Brief

2.2.1 Basic requirements of the Centre

The functional requirement of the proposed Social Justice Hub, integrated into city gardens, are divided into four categories and accompanied by a brief description of what each aims to achieve. Figure 7 illustrates the thought process from the (Figure 6) social justice principles to a programmatic layout. The basic principles required are:

1. Traditional Healing Center: An area for healing, like therapy, with consultation cubicles for individuals and small groups that are publically accessible but also private enough not to infringe an individual's privacy. An array of meditational gardens comprised of carefully selected elements, as well as an auditorium for larger group discussions/seminars, and a studio for group activities such as yoga.

2. Workshops: The purpose of the workshops will be to achieve knowledge transfer between experts and the laymen of the public, providing access to information and strategies inaccessible before. These workshops will incorporate produce and flora grown in the local gardens as a way of skills learning. The production will also be commercialized on a small scale as a craft-facility.

3. Marketplace: an open market for small businesses entrepreneurs to market and sell their produce or manufactured products, accessible for retailers. Larger scale commercial services such as cafes, restaurants and franchises. Exhibition spaces for permanent and temporary displays, catering for artists, artisans, etc.

4. Landscaped garden: a public garden for the leisure of the pedestrian, with segments with specific purposes. Additionally Garden tours and practical demonstrations of growing methods, curing, etc. could take place here. An amphitheater where the public can come and enjoy local and national performances, services and product launches.

Architectural Challenges:

The ensemble should serve as a health and wellness center, market place and workshops but also as a platform for the community to share public participatory services. It should support the clients vision and provide public green space to the city.

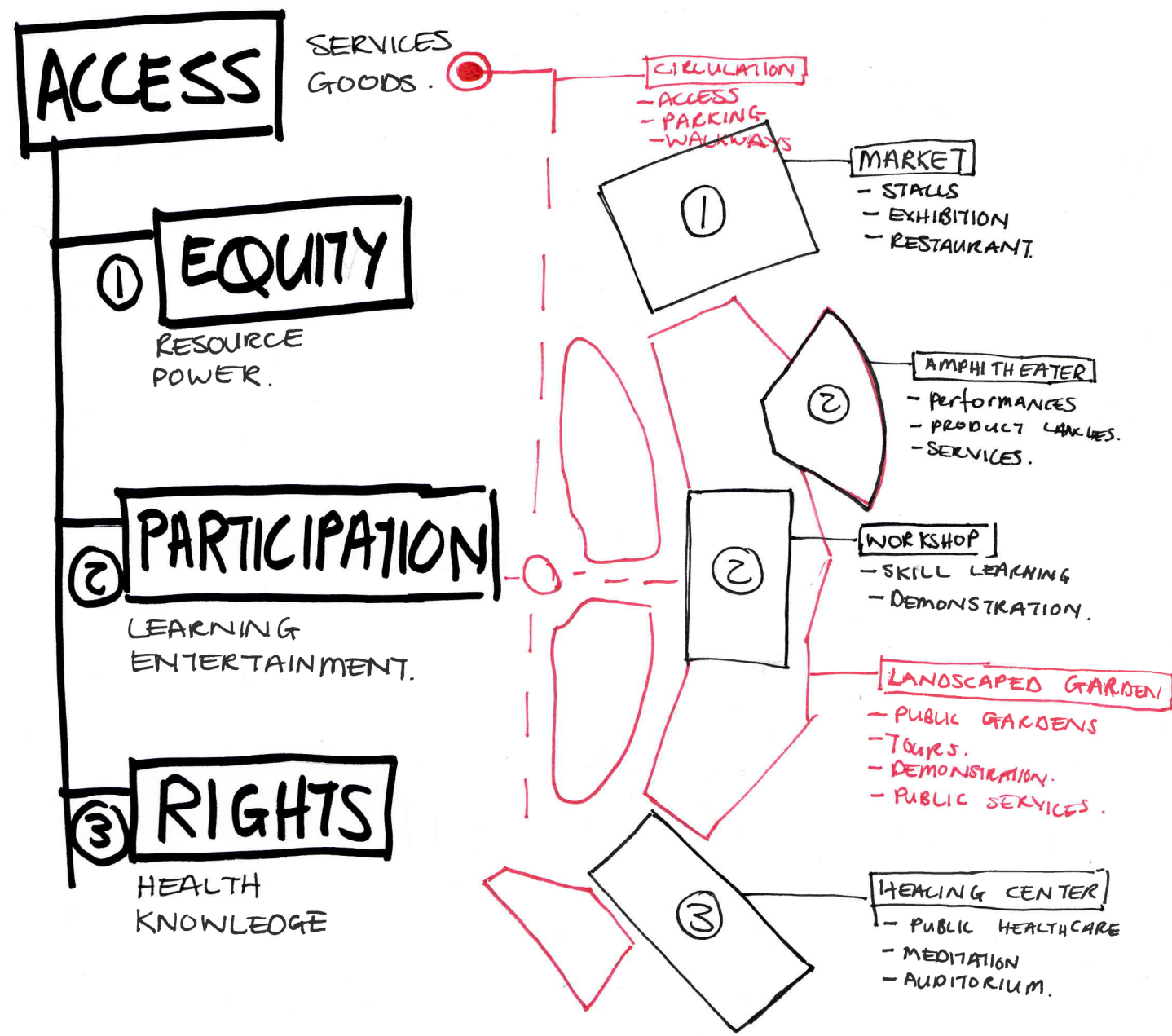


Figure 7 Brief representation (Author, 2019)

2.2 Brief

2.2.2 Users

A total of approximately 200–300 people can be expected to make daily use of the social justice hub, using a low technology construction building strategy.

Primary users will be:

Staff:

Professional staff

- Therapists
- Instructors
- Lecturers
- Craftsmen/ Artisans
- Entertainers

Permanent staff

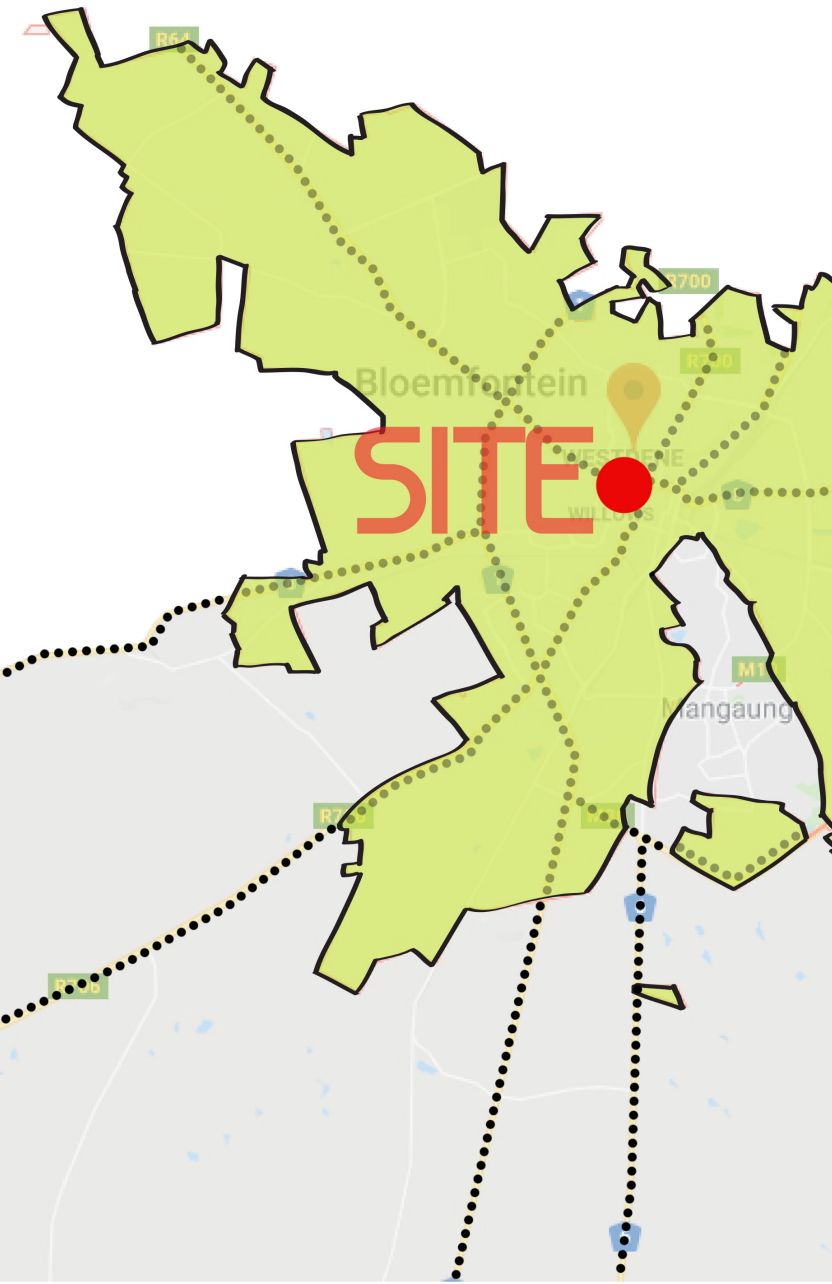
- Office staff
- Gardening staff
- Cleaners
- Security
- Restaurant staff
- Domestic staff

Clients:

Formal appointments
Informal gatherings

Visitors

Individuals
Tour groups



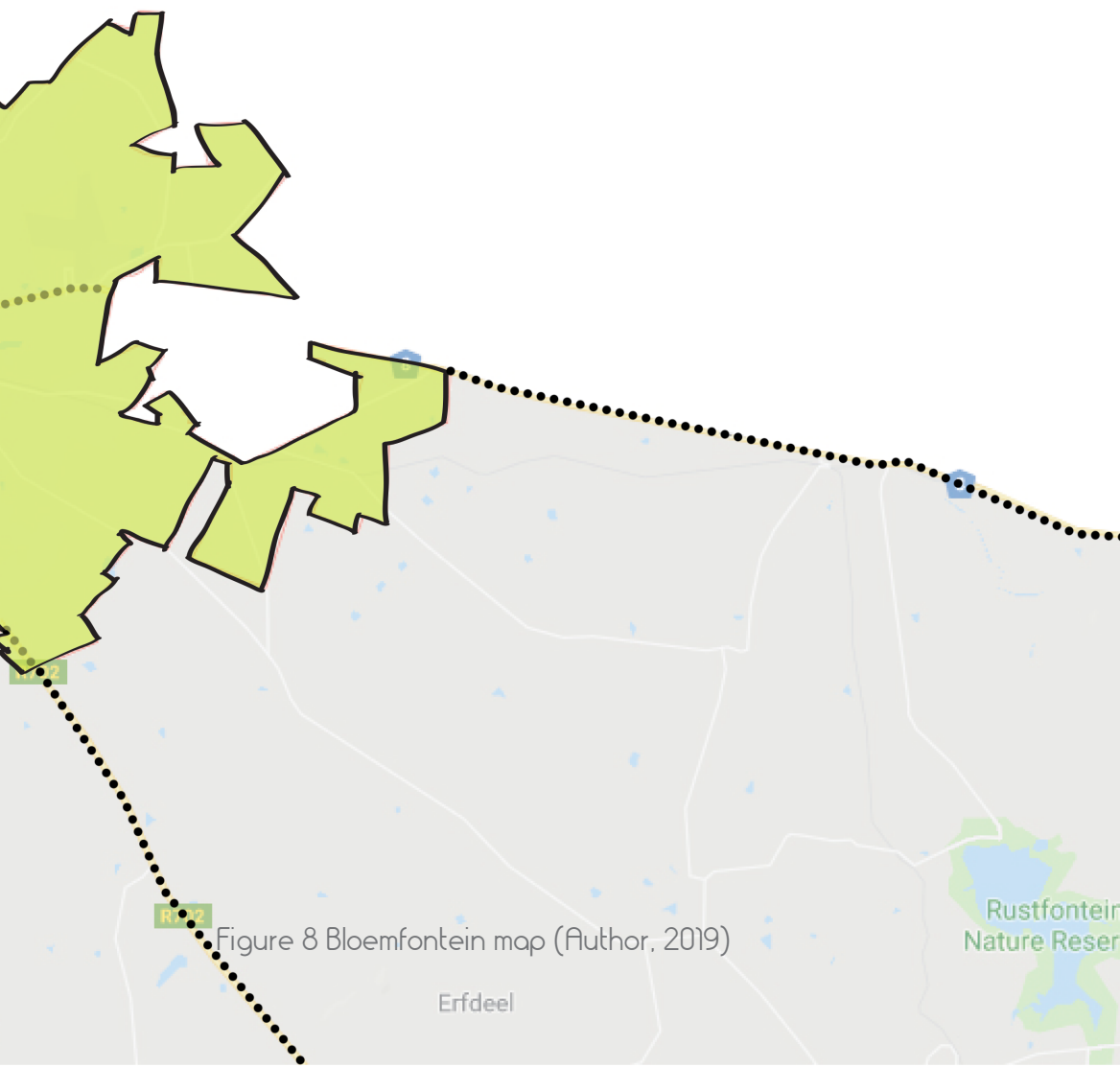


Figure 8 Bloemfontein map (Author, 2019)

Architectural Challenges:

- Building proposal should satisfy the basic requirements set out by the brief of the client
- Functionally laid out programme
- Accommodate the diverse group of possible users.
- Adhere to basic building regulations for public buildings in South Africa.

2.2 Site overview

2.2.1 Argument and theory on site choice

The site is located on the grounds of the King's Park Rose Garden and the Bloemfontein Zoo, in the central part of the city. The site forms part of the threshold between the residential and commercial zones and districts of the city.

Located in the central part of the urban fabric of Bloemfontein, it becomes a threshold between urban and nature formed on the central node of the axis of the city (Figure 9). This area is surrounded by the CBD and residential zones, the site is a green zone and becomes a separated island of nature, a buffer between the city noise and the tranquility of nature (Figure 10). As a central green space to the city, it has large amounts of vehicular and pedestrian traffic around and adjacent to it. The available space for intervention exists in the southern part of the site, right on the historical central axis of the city (Figure 9 and Figure 10). The development of the historical site, which dates back to 1899 (Auret 2015: 204), can be seen as a regeneration or re-activation project.

The chosen site has the potential to offer an opportunity of intervention to become an integrated part of the existing Loch Logan Precinct. Having a programme that encourages public engagement, it will become a platform for inclusive participation. The proposed new public access should satisfy the public to aspects such as human rights and equity as a social justice platform based on environmental ethic principles, and these principles will however not be discussed in lengths in this dissertation.

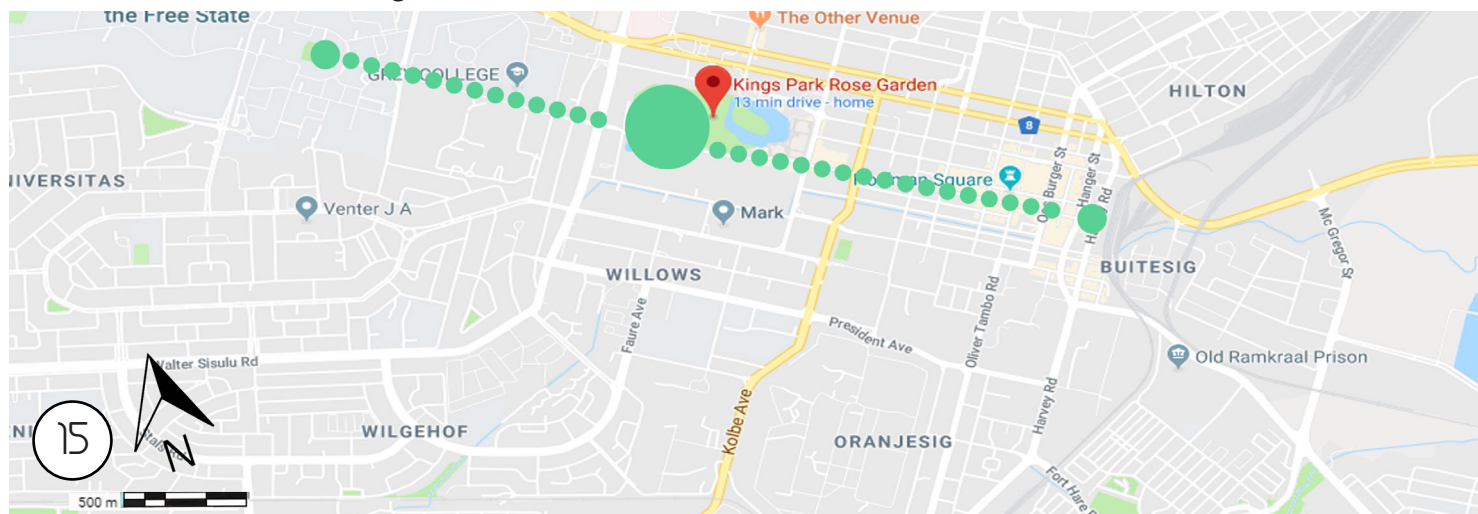


Figure 9 Central axis (Author, 2019)

Figure 10 Bloemfontein (Author, 2019)

CBD

ZOO

LOCH LOGAN

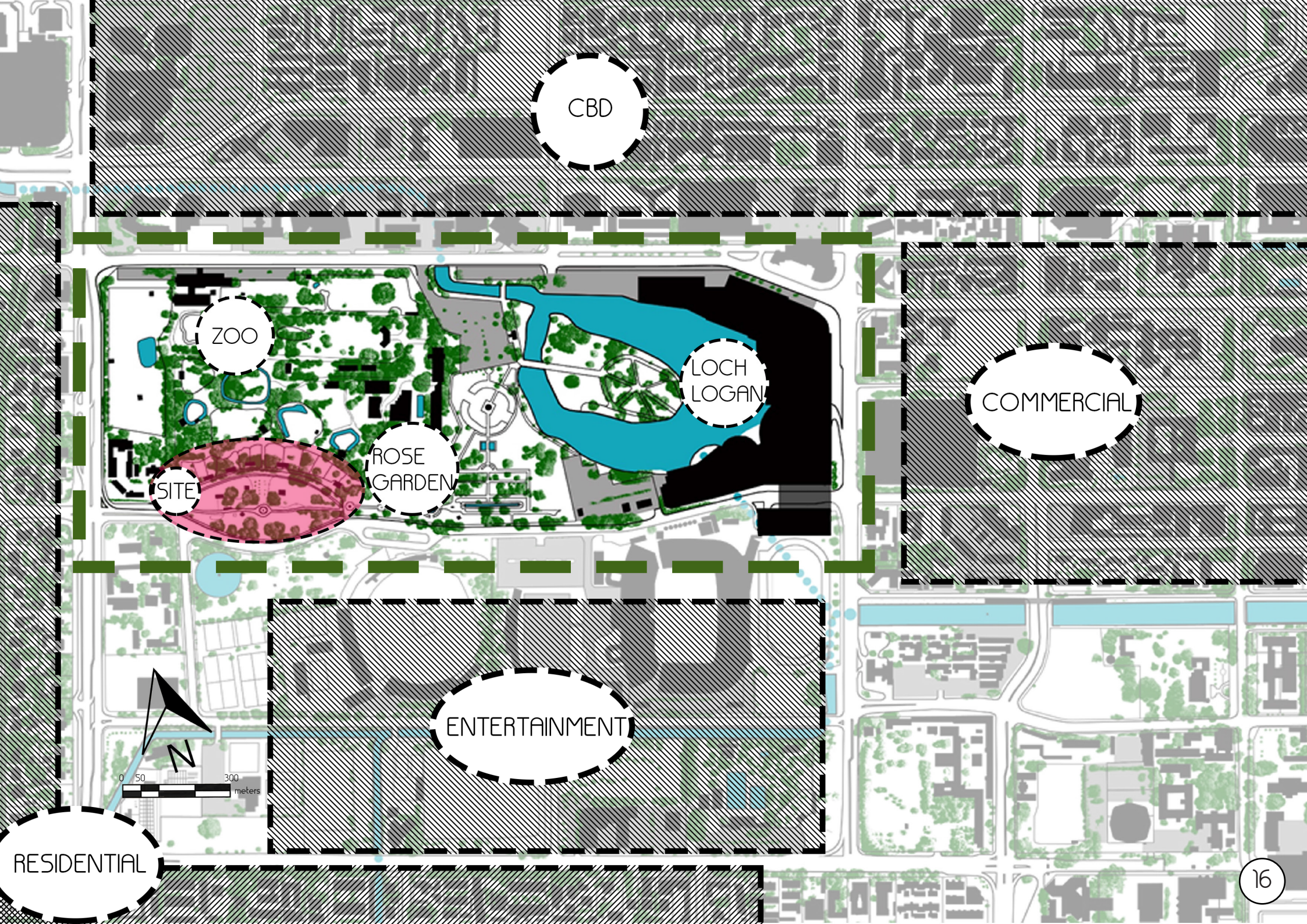
COMMERCIAL

SITE

ROSE GARDEN

ENTERTAINMENT

RESIDENTIAL



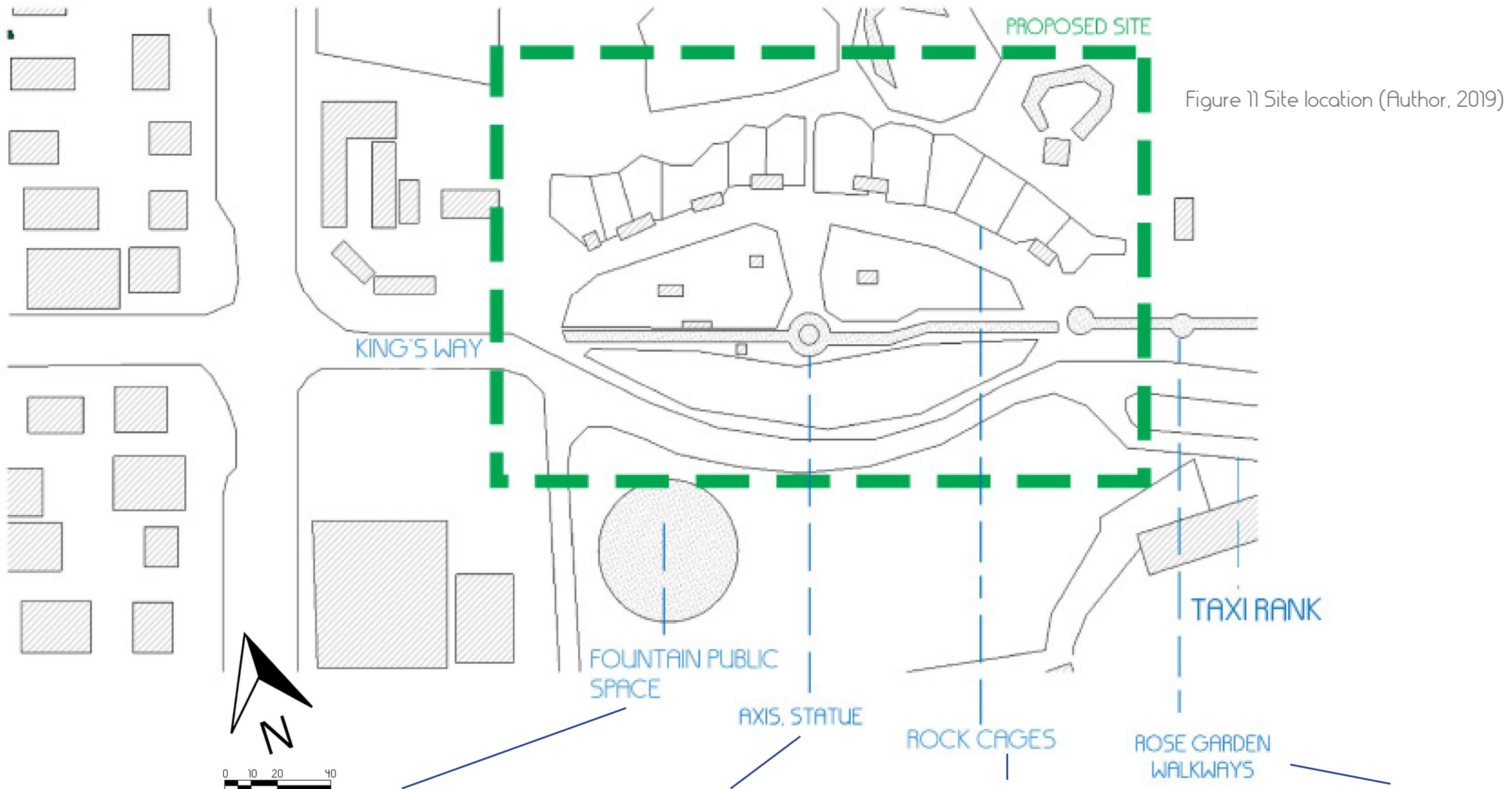


Figure 11 Site location (Author, 2019)



Figure 12 identified spaces appropriately (Author, 2019)

2.2 Site overview

2.2.2 Physical site considerations

The following physical site considerations were identified in chapter 4 accordingly.

The chosen area on site is the old rock cages, Figure 11, Figure 13 Figure 15, as part of the rose garden. These cages were built with walls made from local dolerite rock that extends from the natural ground but also as penetrates into the ground. The largest of the Bloemfontein Zoo's animals are kept here, from lions and panthers to hayenas and jackals (Figure 11). The part of the Rose Garden includes the axis line that extends into the Bloemfontein's Zoo boundaries that have since been sectioned off, Figure 17. This area includes the walkway and an obelisk that becomes a central axis that historically ran through the Rose garden parallel to King's Way, Figure 12 and Figure 16 (Auret, 2019: slide 90).



Figure 13 Rock cage wall (Author, 2019)



Figure 14 Caged animals (Author, 2019)



Figure 15 Rock cages (Author, 2019)

2.2 Site Overview

2.2.2 Physical site considerations

The site is located on a threshold between the city and the park (Figure 11). King's Park can be viewed as a transitional space between several zones. (Figure 10) Residing between residential, industrial, commercial and entertainment (sports stadium precinct). Pedestrian traffic is notable on the southern side (King's Way), although the site obstructs movement and circulation between the northern and southern edges.

The site chosen for the intervention of an urban garden ensemble with a functional programme as mentioned by the client brief exists on the southern edge between the Bloemfontein Zoo and a slight part of the Kings Park garden layout. The site is not vacant, but rather in a state of slow decay, as the zoo is not introducing animals to empty cages, it seems that the zoo is laying in wait for absolution before the development will find place (Mtebele, online: 2018). A recent investigation of the Bloemfontein Zoo was done by Manguang city manager Sibongile Mazibuko in collaboration with the national SPCA wildlife procession unit inspector Wendy Wilson (Masoetsa, online: 2012). Wilson stated that the zoo is facing growing challenges such as the aging of the zoo infrastructure, staffing and animal skills, public complaints of the state of the zoo as well as the message that the zoo presents to its visitors (Wilson, 2012: interview). The Manguang municipality stepped in and rose to the challenge to improve animal welfare in enclosures, Sibongile Mazibuko stated that the municipality is undergoing a study of feasibility to relocate these animals (Mazibuko. 2012: interview).

The site borders with King's Way avenue where there is a steady stream of social interaction, from the taxi ranks and sport events to the large fountain picnic area across from the site that sees heavy use throughout the weekend (Figure 11 and Figure 19). Although trashed the site is used frequently creating a unsightly view, the Rose Garden however is completely bordered off and inaccessible leading to the abuse of the park adjacent. The Bloemfontein zoo also borders this area but is only accessible from the northern entrance as people socialise between a visible barrier. King's Park Rose Garden is inaccessible for the public, potential visitors to the site are greeted with locked gates and barred entrances, opening times were stipulated on access boards, but this was arbitrary, as the garden is unoccupied and unused (Figure 18).

Architectural Challenges:

- Celebration of the site's transitional qualities.
- The southern edge of the site should be utilized, the pedestrian traffic can be used to activate this boundary.
- Pedestrian/public access should be available through the site.
- Adjacent unpleasant northern boundary should be addressed.
- The design development should serve as a social justice function.



Figure 16 Obelisk (Author, 2019)



Figure 17 Zoo-Rose Garden connection(Author, 2019)



Figure 18 Fence access Kings Park (Author, 2019)



Figure 19 Fountain + public spot (Author, 2019)

The aim of the social justice hub design proposal is to re-introduce the site to the public from an exclusive semi-public space to an inclusive public space, to uncover the inherent potential of the site. It is crucial to acknowledge the current state of the site as a currently underdeveloped green space, its meaning to the city and the environmental issues that is prevalent in the site. These issues will be investigated and addressed through theoretical considerations, Figure 17 explores a visual way of illustrating these considerations that were identified, and are as follows:

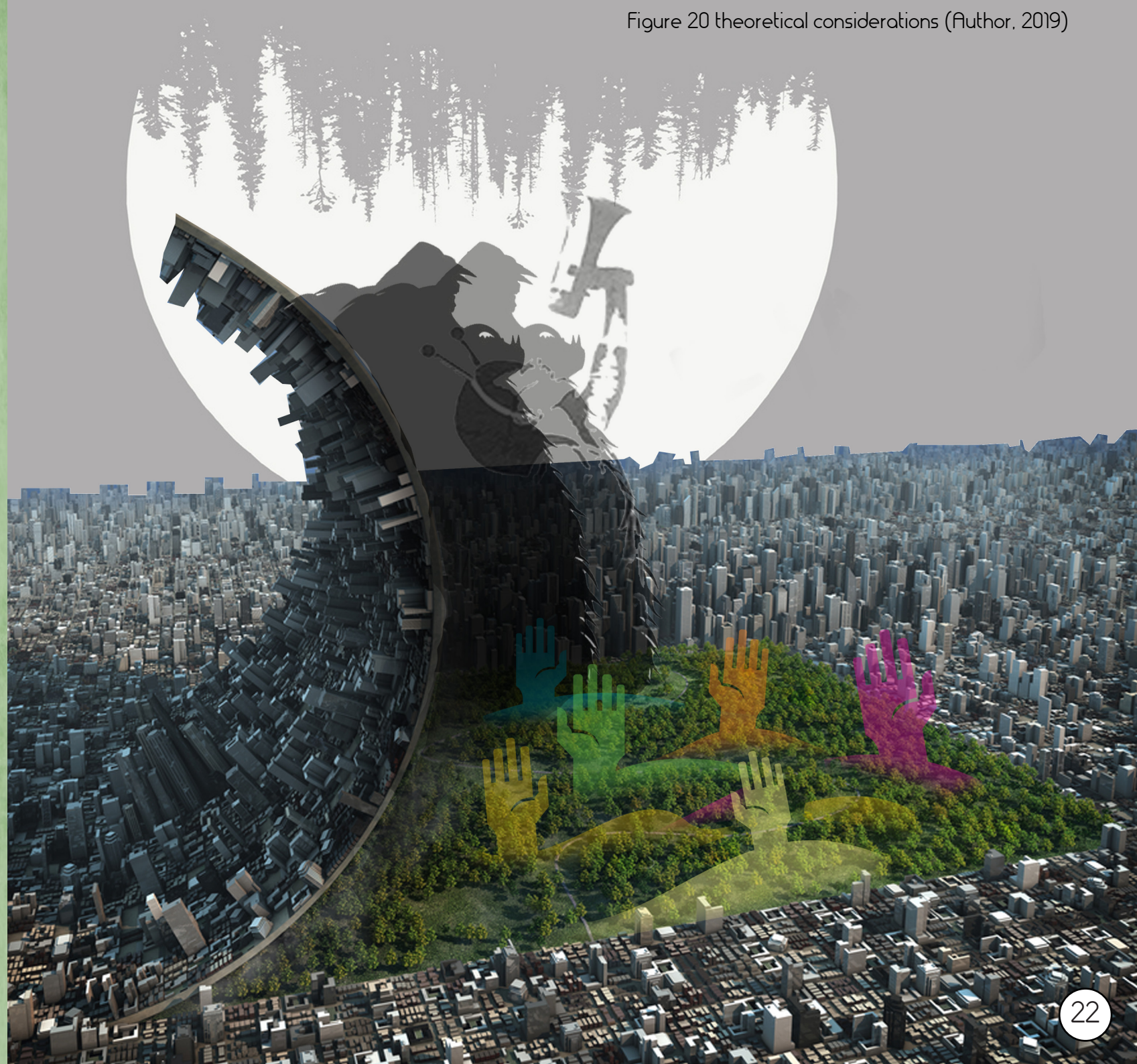
a) Urban Ecology and Ecosystem Services: Natural resources, and the conservation and management thereof, becomes vital with the continuous gravitation of population to urban areas. The concept of sustainability science explores the interaction between environment and human systems, landscapes and urban green spaces. This concept plays a pivotal role in this collective vision (Wu 2013: 1000). The site of King's Park and the Bloemfontein Zoo is an integral part of the city as an organism, and the decay of this significant space is relevant to the people of Manguang, as it signifies a problem with the organism. In Figure 20 this is illustrated as the exposing of the park (unused green space) under the city (urban fabric).

b) Social Justice: A public space refers to an area or place that is open and accessible to all peoples, regardless of gender, race, ethnicity, age or socio-economic level. These are public gathering spaces such as squares and parks, or connecting spaces, such as sidewalks and streets. Social justice inclusion should be provisioned culturally, economically and spatially. Green space areas are key to the delivery of urban social justice and public spaces lacking interaction (Unesco, 2019: online). The development of inclusive public spaces within the site of King's Park and Bloemfontein Zoo holds a possible solution for social and environmental justice of the public and site as an unused green space respectively. This is illustrated as the empowerment of nature (Figure 20, emerging lion) and the public (Figure 20, the boy standing by the lion) by granting them a voice and in this way also justice (Figure 20, megaphone above roaring lion and screaming boy).

c) Human Health and Well-being: The link between urban ecosystems and public health have been documented through a variety of benefits. The more appropriate being aesthetics and engagement with nature, outdoor recreation and physical activity. Green spaces can play a definitive role in shaping healthy communities (Jennings et al, 2017: 74). There exist an opportunity for public inclusion and participation to the site (green space) that can benefit the people of Manguang in many ways. In Figure 20 this can be seen as the hands reaching out from the green space, as health and well being are generated by the urban ecosystem. Urban ecosystem issues involve concerns related to social justice that involves human health and well-being (Jennings et al, 2017: 70).

Architectural Challenges:

- The effect of urban ecology and ecosystem services on the site should be considered.
- The conflict and historical significance of the site should be settled in relation to social justice
- The disconnect between urban green space and the public should be resolved.



2.4 Unique Approach

When looking at the site as an organism that functions in the larger scale of Bloemfontein and South Africa, it becomes an integral part of the larger ecosystem. The decaying of the site organism is thus of importance to the larger system it is part of, an intervention is necessary not just for the site but the system as a whole.

From personal observations of the local population distribution during the day (Figure 21), as well as population distribution during the night (Figure 22), it shows more activity around the King's Park area during the day. At night there is a large cluster of residents residing in close proximity to the site. This area is inaccessible as an ecosystem in its current state and serves less than optimal results as a public green space to the public that resides within the same ecosystem. The site has the potential to be re-activated in its local and larger context in this ecosystem.

The organism of the park, lies in such a central nucleus of the city, creating a grander entrance to the smaller scale of the ecosystem of the city. When driving through, in and around and in the city, it becomes a major pivot point; most roads lead past or through the area (Figure 23). This creates an opportunity for an intervention to re-invest in a space that had an integrated influence in the past but has become disconnected, an island from the city organism.

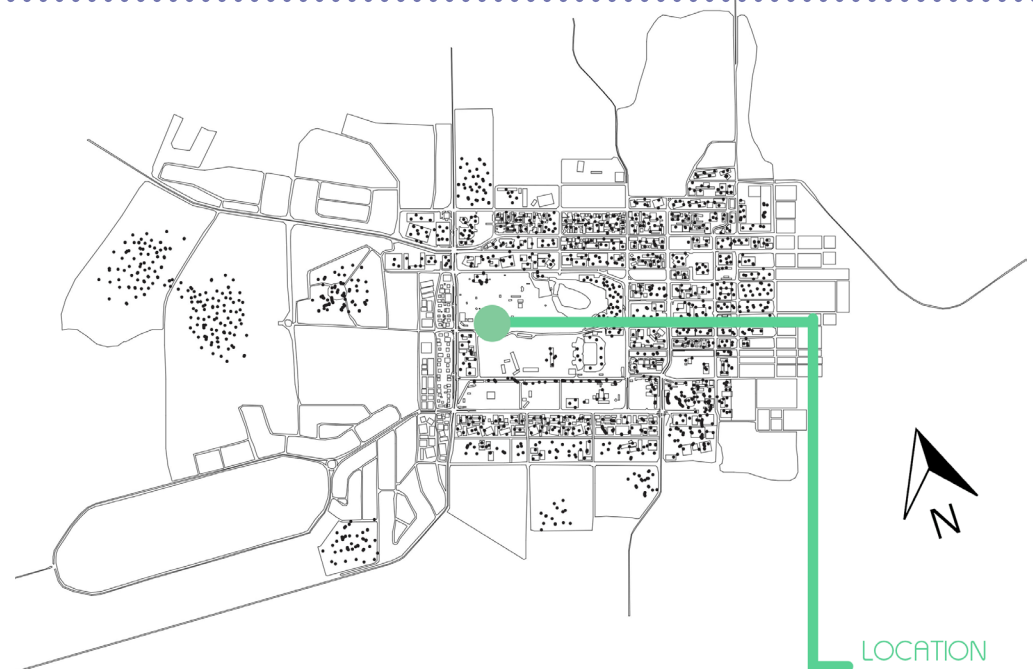


Figure 21 Population distribution during the day (Author, 2019)

LOCATION OF SITE

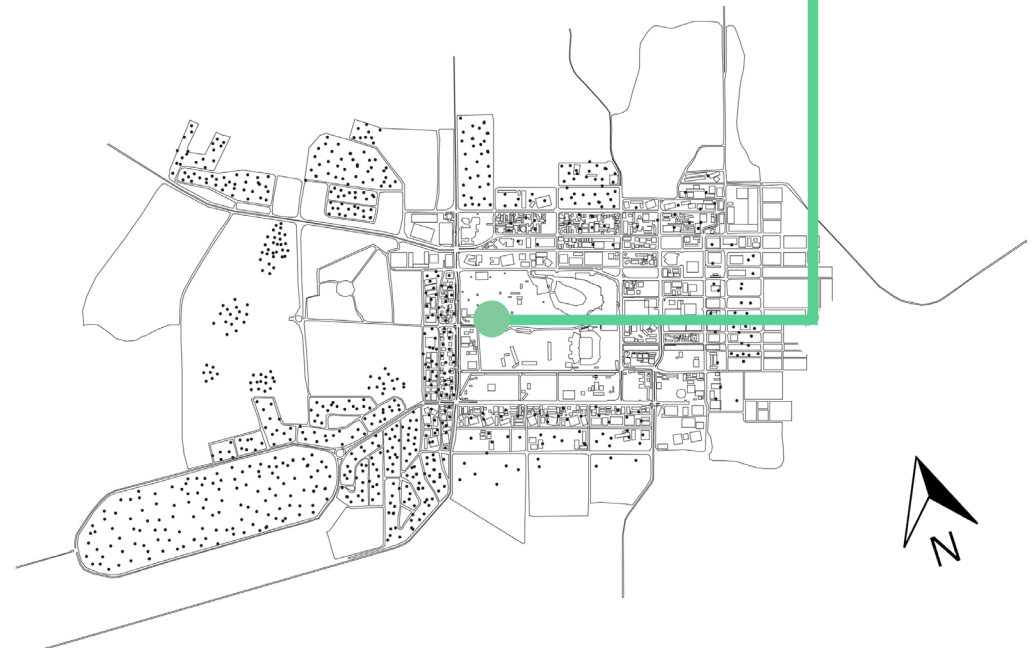
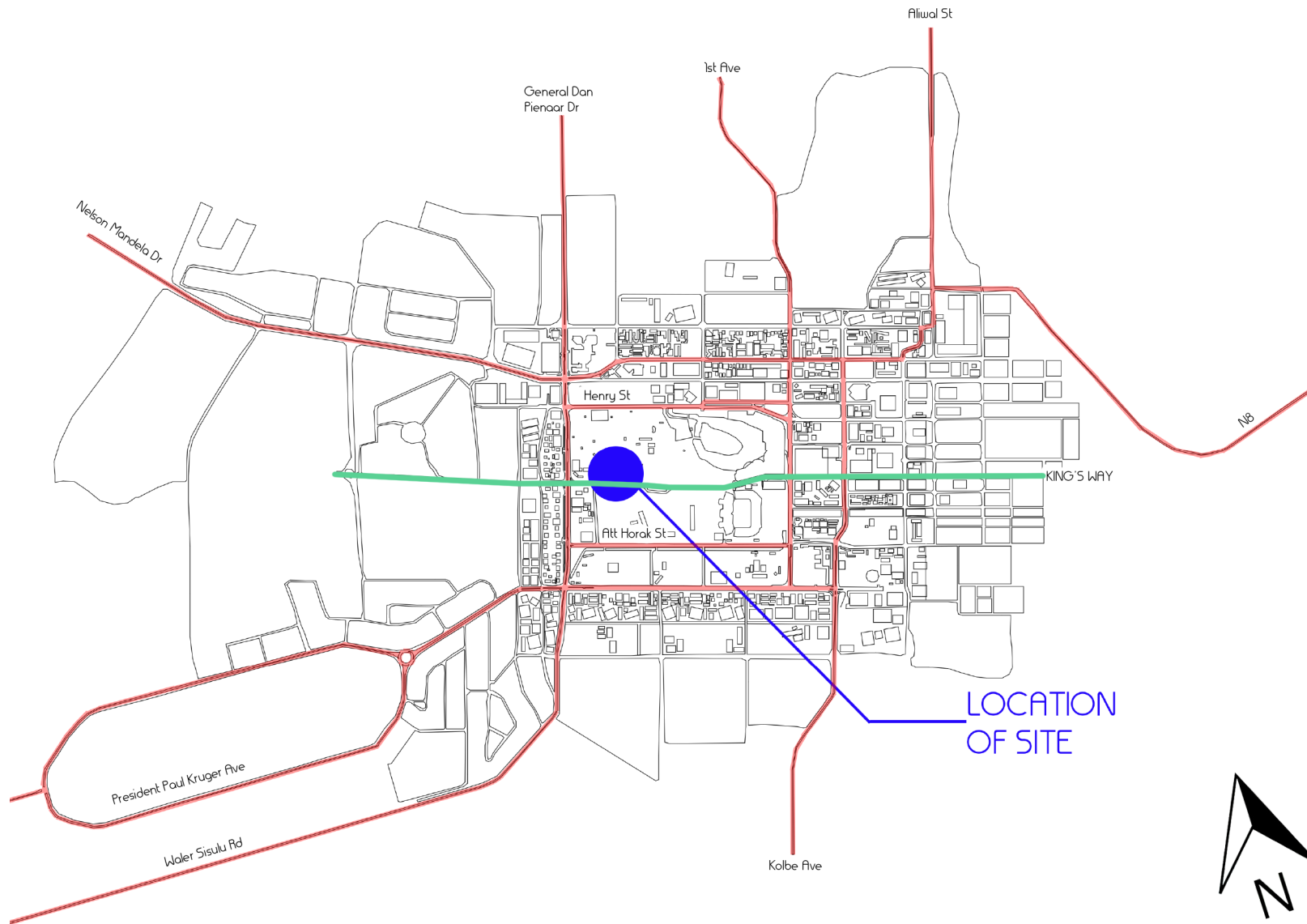


Figure 22 Population distribution during the night (Author, 2019)



Architectural Challenges:

- Justifying the site's central location as the partial nucleus of the city
- Reviving the function of the site within the larger system
- Appropriate design approach of the significance of the site.

Figure 23 Roads leading through site (Author, 2019)

Chapter 3

The functional building requirements, together with the physical and conceptual site considerations, determine the architectural challenges that will guide the design process. By merging the challenges with desired outcomes, a hypothesis can be proposed to test how the design can solve these problems.

Hypotheses and Project aims

3.1 Hypothesis

A hypothesis states predictions about what the research will find. This tentative answer to a research question propose a relationship between two or more variables. An independent variable is something the researcher changes or controls. A dependent variable is something the researcher observes and measures. (McCombes, 2019: online). In the case of this design proposal, the hypothesis is grounded on the following:

Independent variable :	Social Justice Hub
Dependant variable:	The CBD of Bloemfontein

Desired positive effect:	Inclusive public participation
Measure:	Increase of care

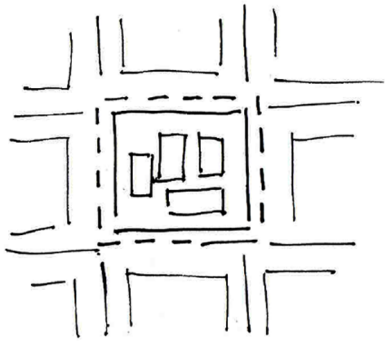
The hypothesis is that a social justice hub in the CBD of Bloemfontein will provide for an increased care of inclusive public participation.



3.2 Project aims

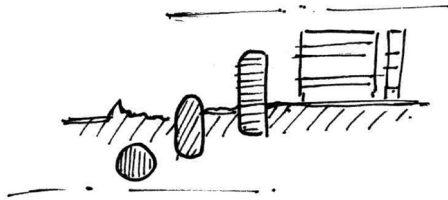
The aims of the project can be derived from the hypothesis; these aims are illustrated in the four diagrams of Figure 25 and the mind map in Figure 26:

1



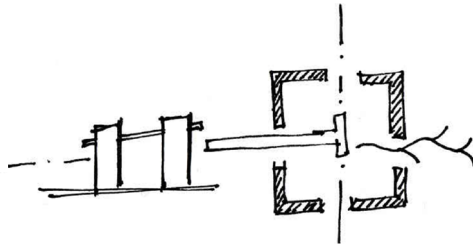
1 - Develop the Social Justice Hub as a functional public building

2



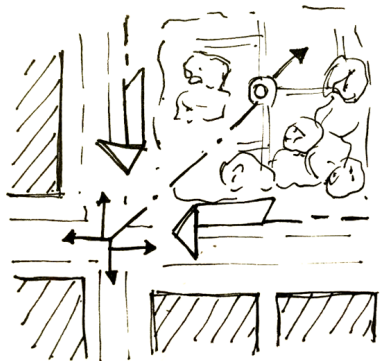
2 - Improve the qualities of the site as to re-introduce it as engaging public space.

3



3 - Create a community orientated institutional ensemble that can re-establish the historically significant site as an urban green space to the public participants in Manguang.

4



4 - Establish a participatory new connection between the public(urban) and the park(nature).

27

Figure 25 Project aims illustrated (Author, 2019)

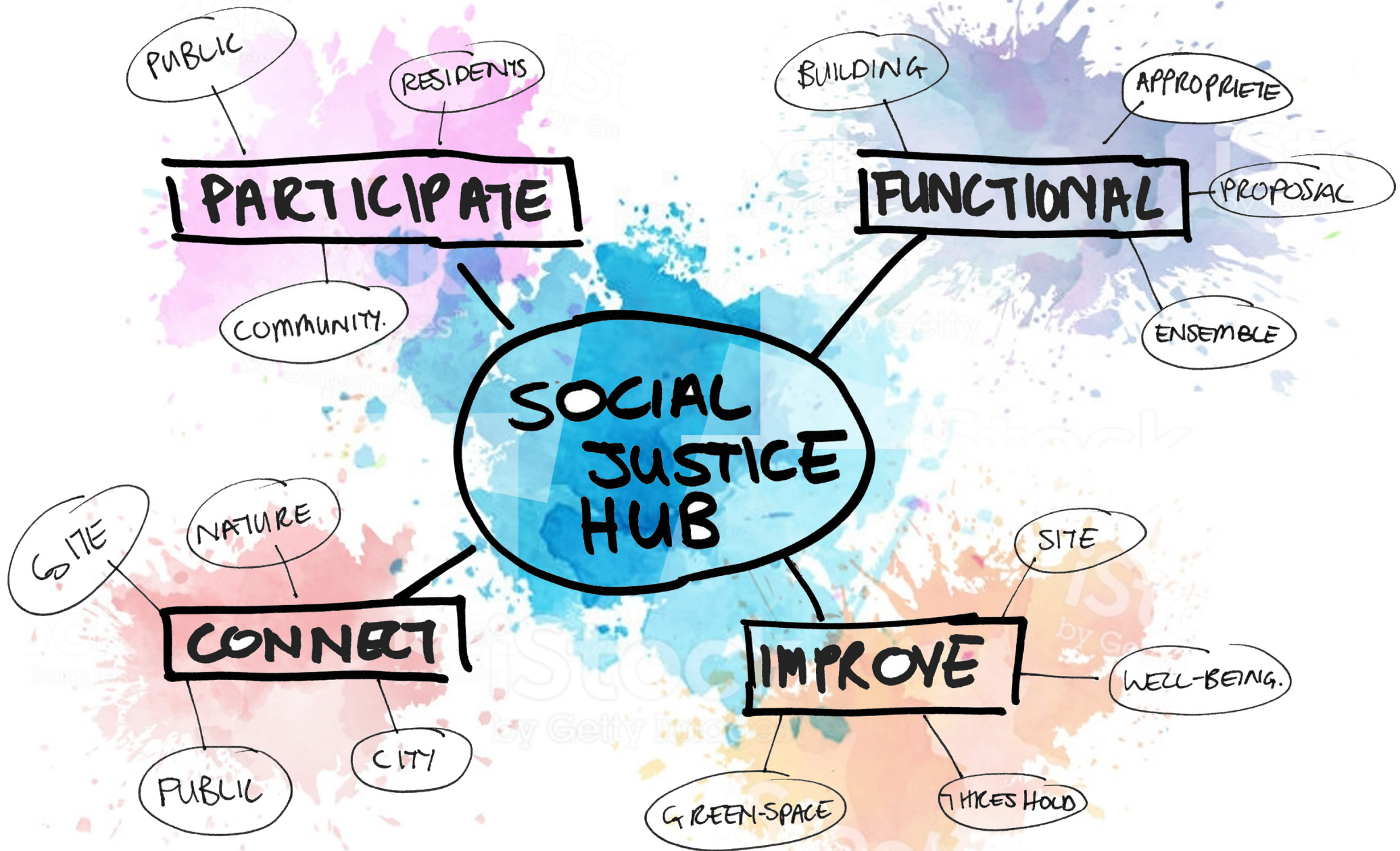


Figure 26 Project aims mind map (Author, 2019)

PART 2:

DESIGN INFLUENCES

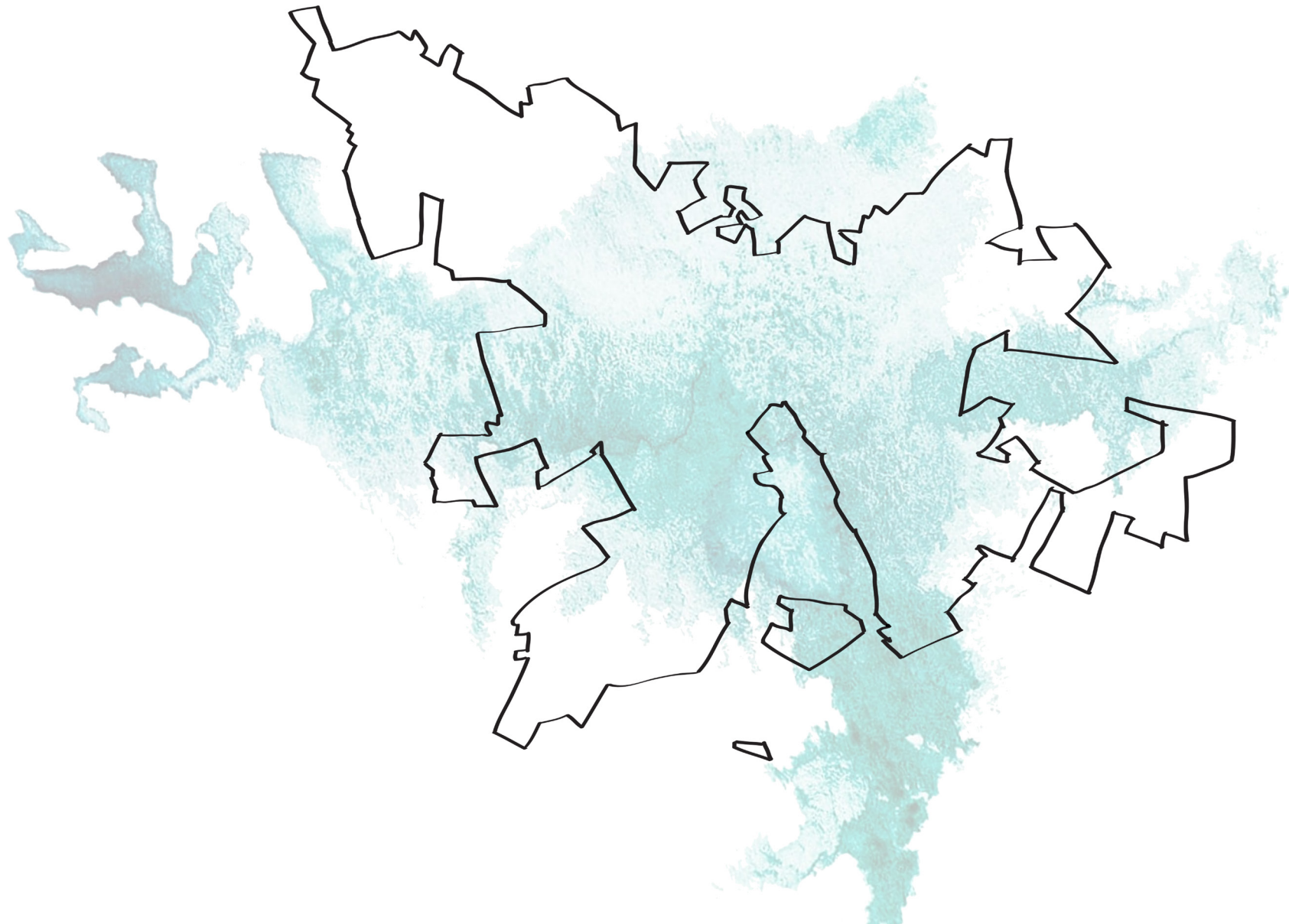


Figure 27 Manguang municipality border (Author, 2019)

PART 2: DESIGN INFLUENCES

Chapter 4: Site analysis and historical background

4.1 Locality and brief history

4.1.1 Bloemfontein

Bloemfontein was founded in 1850 and forms part of the Manguang Metropolitan Municipality. The city is the judicial capital of the province of the Free State and the geographical location situates the city in the center of South Africa (FAK, 2019: online) (Figure 29). As the center point of the country Bloemfontein it is a vital point as a transport node, where several railway and road networks intertwine, connect and extend (My Geskiedenis, 2019: online).



Figure 28 Court of appeal, Bloemfontein (Author, 2019)

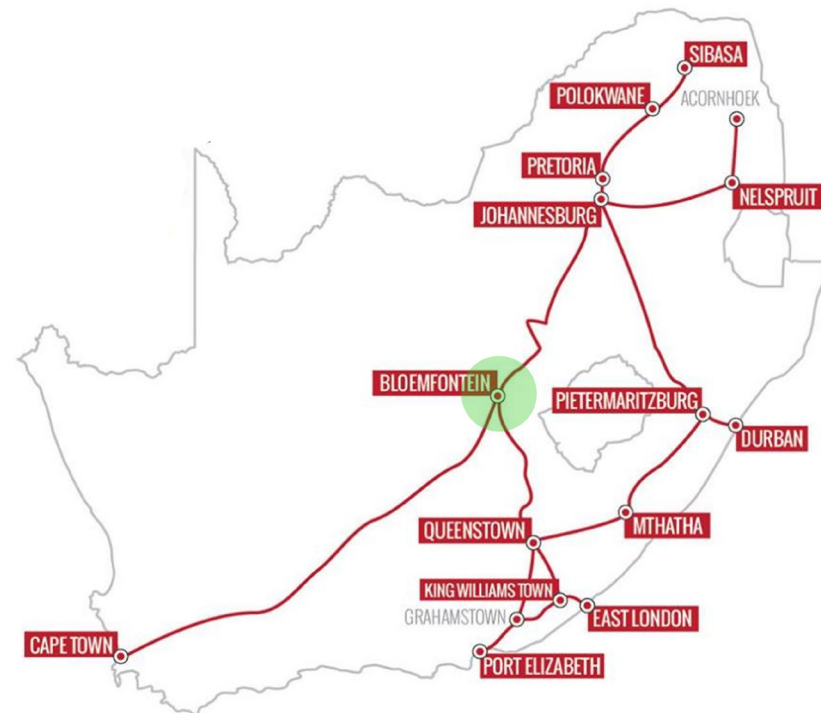


Figure 29 Bloemfontein as a central transport node (Author, 2019)

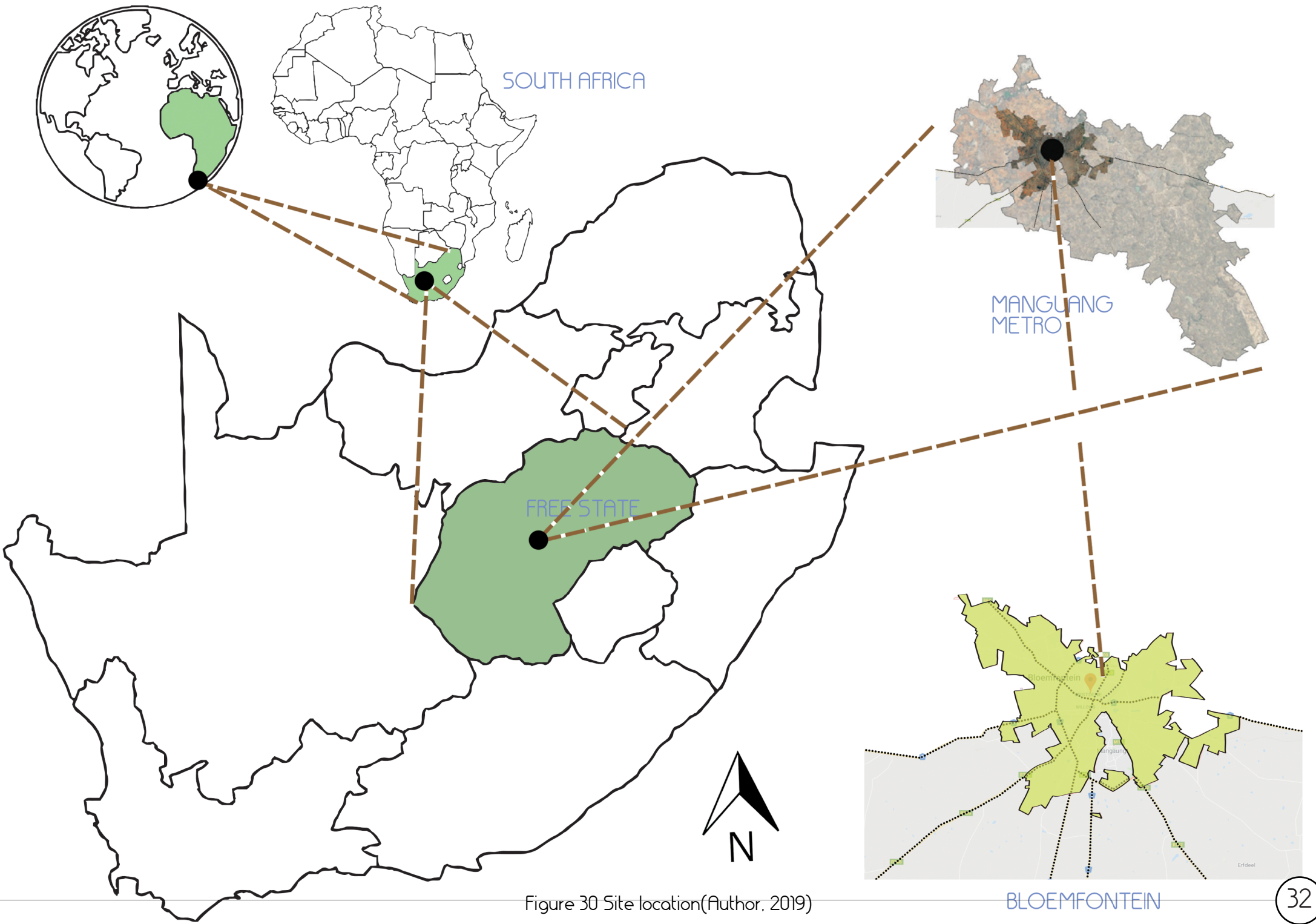


Figure 30 Site location (Author, 2019)

4.1 Locality and history

4.1.2 King's Park

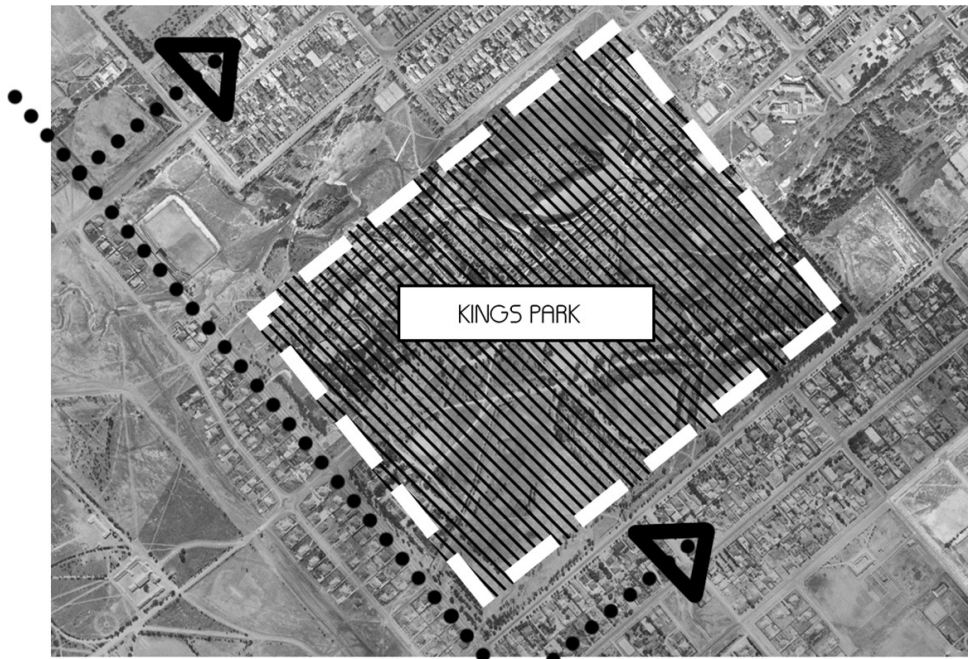
King's Park was founded in 1899, serving as a memorial for the crowning of King Edward VII. The Bloemfontein government was willing to concede a large sum of money towards converting the selected land into the park we know today (Schoeman, 1981: 182).

At the time, the site was desolate and empty, and over the course of six years, between 1904–1910, a total of 125 trees were planted (Schoeman, 1981: 258). This action leads to the founding of a nursery and fountain on the site, as well as planning to convert the existing dam close to 1st avenue into a lake (Loch Logan). Figure 33 illustrates how the planting of trees and shrubs is the central founding point of Kings Park as the green centre circle.

During this time the animal population in the park also increased. In 1906 an eland was donated to the park. As the donations increased, it led to an encampment and eventually to the founding of the Bloemfontein Zoo (Schoeman, 1981: 182). The first instance of animals being kept the site can be seen illustrated in Figure 33, the taking of nature and the encampment thereof that eventually lead to a formalized zoo in its a current challenge.

By 1935 an initiative was led to "brighten up the town..." a water fountain was installed in Hoffman Square (Schoeman, 1981: 258). The rest of Bloemfontein started to follow suit and flowerbeds were laid out in President Brand Street, King's Park was eventually included in this development. This element can be seen in Figure 33 as the blue discs on a vertical line, this is the representation of the fountains and gardens that were being laid out as ornamental structures. Typical of the formulated garden designs of the 1930's

As the lake was finished and the newly planted trees grew, King's Park popularity started to increase, the city was expanding, changing the location of the park. Development started to envelop the park, this meant that the park was no longer on the boundary of Bloemfontein but rather became more and more central (Figure 31). By 1915 an estimated 1000 people would enjoy their Sunday afternoon in the park (Schoeman, 1981: 258)



BOUNDARY OF CITY, CIRCA 1900

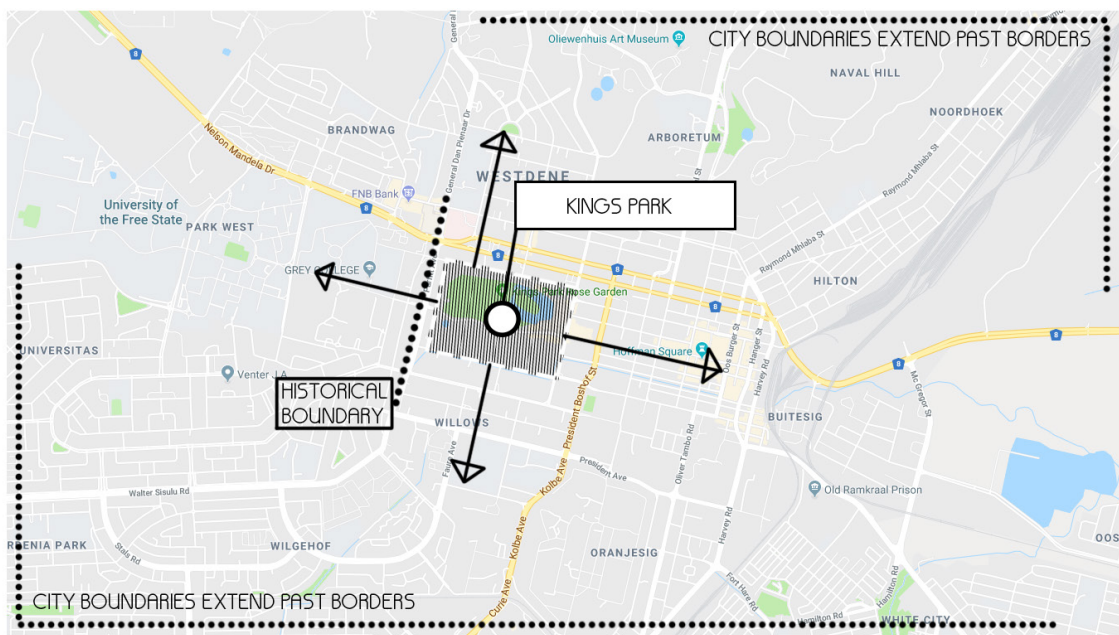


Figure 31 Park location past-present (Author, 2019)



Figure 32 Historical garden photos (Schoeman, K: 1980)

4.1 Locality and history

4.1.2 King's Park

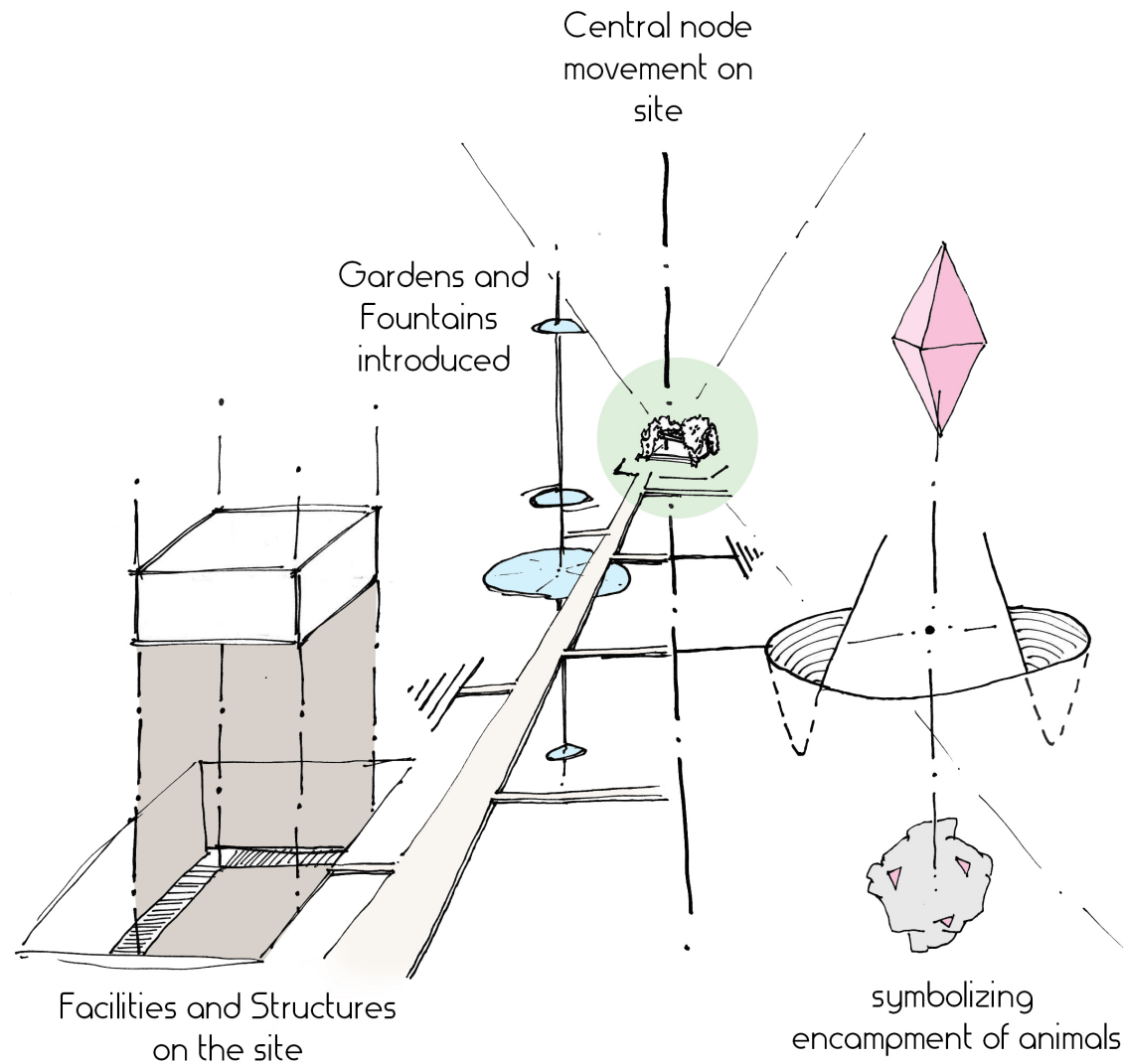


Figure 33 Conceptual diagram of site(Author, 2019)

The growing activity in the park lead to further additions, a teahouse, ponds and a sunken garden, as well as play areas and winding meander walks and drives (Figure 32 and Figure 35). The most impressive addition to this new social hub was the Rose Garden (Schoeman, 1981: 259). Figure 33 represents this last addition to the park as the brown cube rising from the ground, this symbolizes the creation of facilities and structures upon the park.

The Rose Garden was laid out to commemorate the visit and opening of the garden in 1925 by the Prince of Wales. It boasted 3000 rose trees, a stage for receptions, and was decorated by 1500 meters of pergola (Figure 34 and Figure 32). Attractions were held on Sundays in the park, becoming a popular form of entertainment in Bloemfontein. Finally, in Figure 33 , all these elements are tied together by the connecting pathways and movement on the site, represented by the line originating from the central green circle into a pathway (Schoeman, 1981: 259).

Being responsible for the cities nickname, the City of Roses, King's Park can be described as the embodiment of the "planting spirit" of the people of Bloemfontein. Remnants can be seen as entering from Nelson Mandela drive, and on the way to Langenhovenpark (Figure 36). The following section will highlight some important milestones as a timeline of historical events of Bloemfontein (SA history, 2012: online).



Figure 35 Pergolas on site(Author, 2019)



Figure 36 Fountains and walkways on site(Author, 2019)

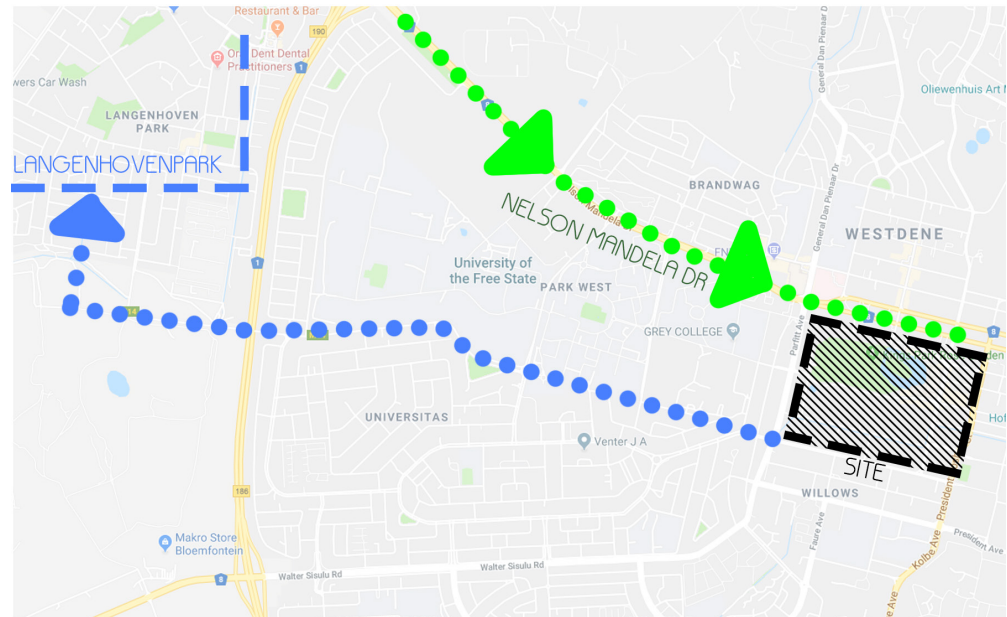


Figure 34 Remnants seen (Author, 2019)

1824

The Matabele, under Chief Mzilikazi, settle on Thaba Bosiu.

1846

Major Henry Douglas Warden appointed to set up a British residency in the area. 26 March, Wardens troops, known as the Cape Riflemen, arrive in Bloemfontein.

1849

The First Raadsaal is built. (Figure 37)

1850

Wesleyan priest arrives in Bloemfontein. June, first municipal commissioner is appointed. 10 June, the first newspaper, the Friend of the Sovereignty and the Bloemfontein Gazette are printed.

1852

First Roman Catholic church is built in St George's Street May, the NG congregation moves to their first church in Kerk street. (Figure 38)

1854

23 February, the Bloemfontein Convention is signed, giving the Orange River Sovereignty self governing status. May, Hoffman elected as first State Pres of the OFS.

1859

April, 5 municipalities are chosen. April, Market starts.

1861

Plans for Bloemfontein's first hotel, the Free State Hotel, are laid out opposite the market. Three banks are established: Bloemfontein Bank, Standard Bank, London South African Bank (Figure 39)

1866

New Anglican Cathedral is opened in St George's street.

1869

The first hospital, St. George's Cottage Hospital opened.

1873

Weekly transport service introduced to transfer goods between Bloemfontein and the diamond fields.

1874

Telegraph service starts. The service eventually connects Bloemfontein to surrounding towns and the whole South Africa.

1875

First post office is accommodated in the Old Parliament building on Market Square. The Wesleyan and Lutheran church buildings are completed

1877

The National Museum is established in the former First Raadsaal. The Government's building is built at the top end of Maitland Street. National Bank is established.

4.1 Locality and history

4.1.3 General Timeline

Founding of Bloemfontein



Figure 37 Raadsaal (theHeritageportal, 2019: online)



Figure 38 First Roman Catholic church (alamy, 2019: online)

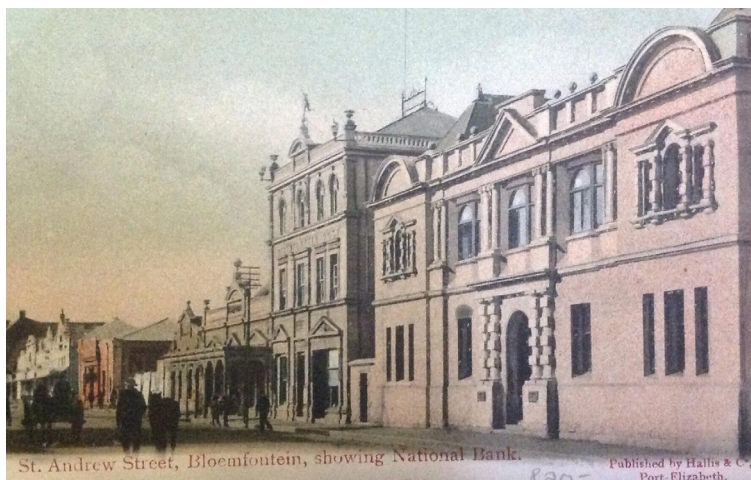


Figure 39 National bank (theheritageportal 2019: online)

	Bloemfontein receives municipal status with a population of about 2567, Robert Innes chosen as the first Town Mayor. N.G Church established. A system of refusal, passenger transport services introduced	1880
	An institution for the mentally ill established. New Town Hall is built. Paraffin lamps light up Bloemfontein streets.	1883
	Free State Line passenger service introduced between Bloemfontein, Johannesburg and Pretoria 14 July, Pres Brand dies of heart attack	1888
	The railway line from Colesburg to Bloemfontein is completed, extended to Vaal River later.	1890
	First traffic regulations for Bloemfontein. 22 June, new post office opened.	1892
	31 October, first government hospital opened	1893
	Right to establish an electrical plant is granted to Delfos Bros	1895
Kings Park established	January, A leprosy hospital is opened	1899
	Electricity system put into place	1900
Planting of trees at the park Introduction of animals to the park	18 March, University of the Free State is founded	1904
	8 January, The South African Native National Congress (later renamed the African National Congress) is formed in Bloemfontein, John Langalibalele Dube elected as the first President.	1912
Garden initiative Rose Garden	1 July, the National Party (NP) is formed in Bloemfontein	1914
	December, The African National Congress holds its 44th annual conference in Bloemfontein	1955
	December, The African National Congress holds its 49th annual conference in Bloemfontein	1994
	Bloemfontein hosts a number of FIFA World Cup games at its Free State Stadium (South African History Online. 2012, online)	2014

4.2 Physical site considerations

4.2.1 Node and Patterns

4.2.1.a Threshold

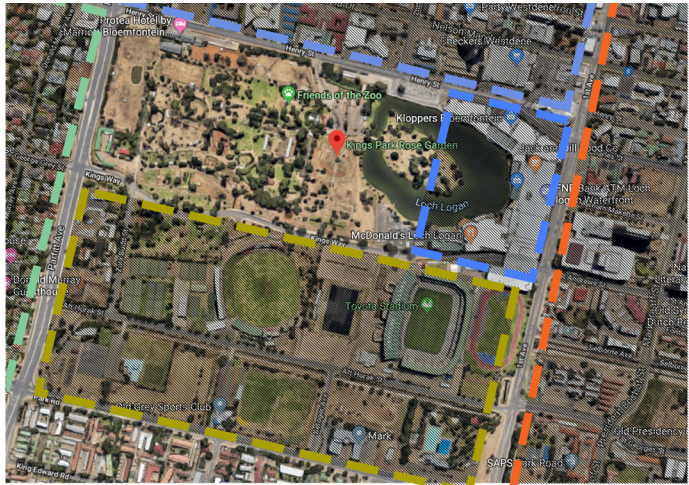
The site is a threshold between the urban fabric of Bloemfontein(public) and nature(park). The area exist between residential westdene to the north, Loch Logan and CBD to the east, residential Universitas to the west and sport recreational precinct to the south (Hoogendoorn, 2006: 72) (Figure 40). With the development of the city, the site has become more central in the city (Figure 41 and Figure 43). The site has been integral since the founding of Bloemfontein, as the city grew, the area become more and more enveloped by the progressing urban development (Auret, 2015: 203) (Figure 43). The most immediate threshold to the site is King's Way on the southern boundary, this threshold has a multitude of access points on the side of the Rose Garden whilst the Bloemfontein Zoo is completely fenced of. The municipality of Manguang has started with a long term relocation plan of the animals of the zoo to Kwaggafontein (Masoetsa, 2012: interview; Bloemfonteincourant, 2013: online)

There are a multitude of nodes on the immediate site, with the most prominent being the Protea Hotel on the Northern boundary, the Bloemfontein Zoo main entrance and parking at the north-east corner, service entrance on the south-western corner and the Rose Garden and Bloemfontein Zoo connection on the south-eastern corner (Figure 42).

4.2.1.b Pedestrian traffic

There is a strong pedestrian footprint on and around the site, this traffic is evident mostly on the boundaries of the site. Circulation for the pedestrian is obstructed by the Rose Garden, although there is means to be access, but from personal observation it was found to be locked and closed off during stipulated "open" times ordinarily. The obstructed access limits participation and engagement with the garden as well as the zoo (Figure 44).

- Pedestrian traffic can activate the site more and should be accommodated through the design proposal.



■ COMMERCIAL ■ RESIDENTIAL ■ RECREATIONAL ■ CBD

Figure 40 Site zones (Author, 2019)

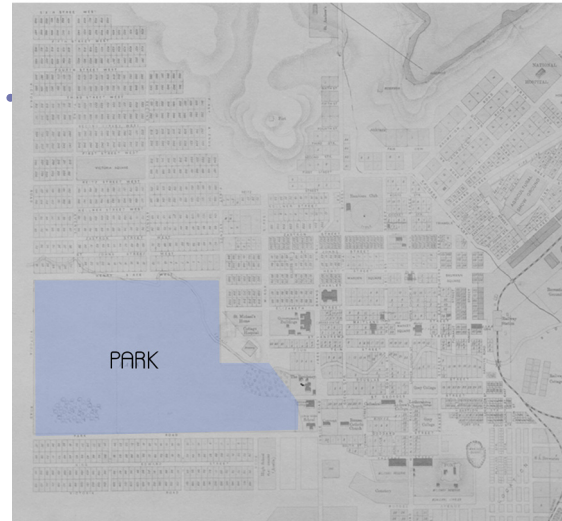


Figure 41 Historical map circa 1900's (Auret, 2019: slide 80)



Figure 43 Current Map (Author, 2019)

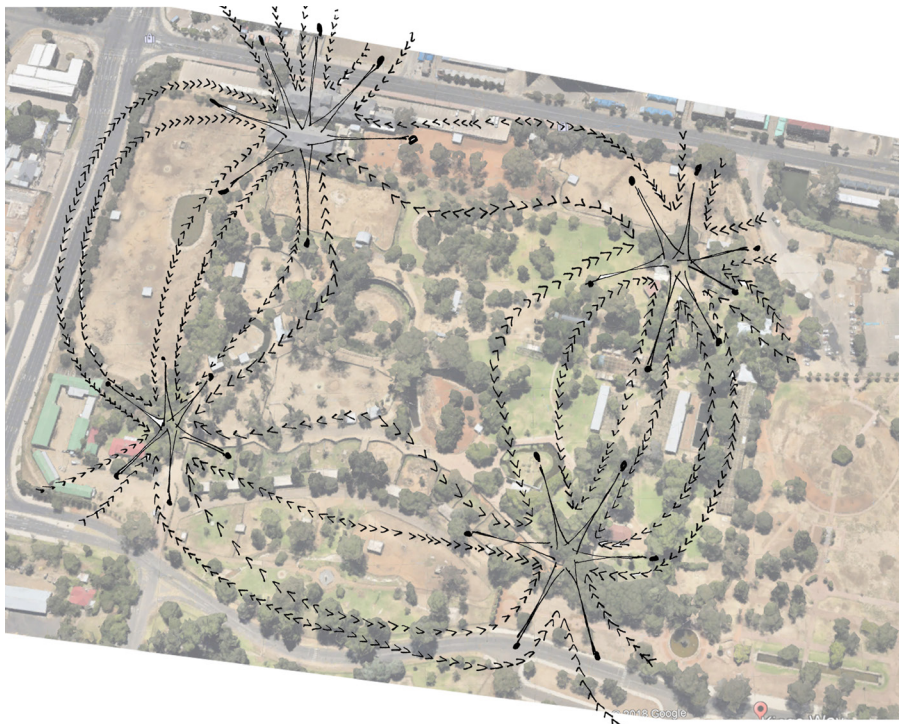


Figure 42 Nodes on site (Author, 2019)



Figure 44 Obstructed access (Author, 2019)

4.2 Physical site considerations

4.2.2 Layout and scale determinants

4.2.2.a Position of the site

The chosen site for the proposed social justice hub is situated on the southern boundary of King's Park. The area is still in use by the Bloemfontein Zoo but is in a state of decay as re-development is needed. The site contains the animal rock cages, as well as the sectioned off part of the Rose Garden central axis. Neighboring the site there is a picnic fountain area as well as an informal taxi rank (Figure 45). The fountain public area that neighbors the site sees frequent use, as people gather to picnic. This area includes a fountain, a play park for children, and braai plots. Even with the immense popularity of this area, it experiences a lot of careless disuse as the space is littered and filthy, the fountain is dirty and full of trash, and the upkeep of the area's facilities is non-existent (Figure 46). Parking is also a problem as there are no allocated parkade spaces, people park on the street congesting traffic (Figure 46). The message that this area portrays is not one of health and well-being, alcohol bottles and glass shards litter the site, but rather a call for an intervention. The need for maintained public gathering space is great and is very evident on this southern boundary.

- The southern boundary can be addressed by removing its visual boundaries and allowing for greater public access to and through the site.

4.2.2.b Climate

Bloemfontein's annual rainfall is mostly accounted for by mid-summer rainfalls of about 370mm. Its lowest rainfall is in the mid-year and it's highest in the start of the year with about 65mm. Average temperatures range from 17°C mid-year to 30°C in the start of the year. Mid-year this region is at its coldest when the temperature drops to 0°C or below (Jacobs, et al., 2013).

- Sun patterns should guide the orientation and specific functions of the programme in line with a sustainability focus and environmental sensitivity

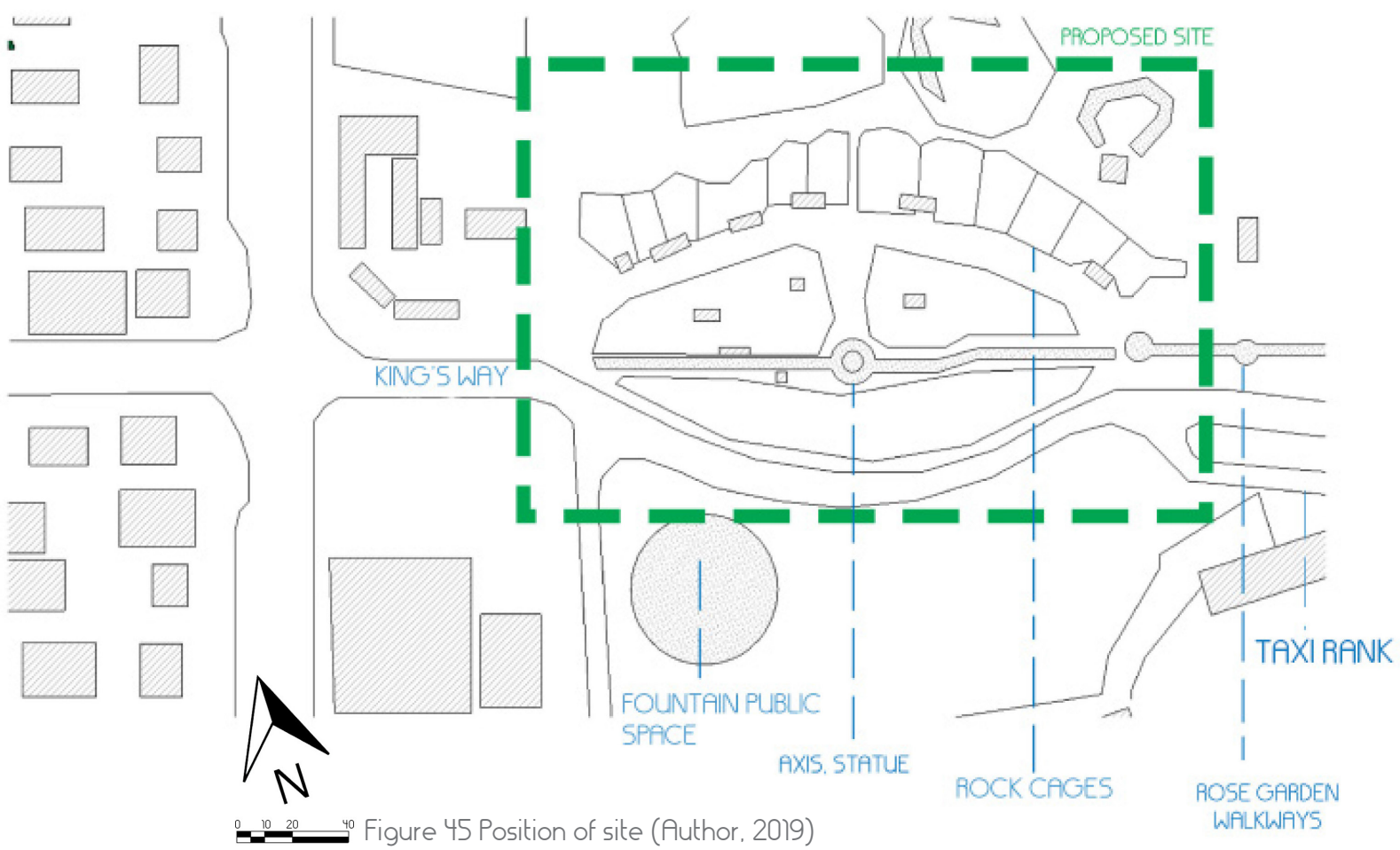


Figure 45 Position of site (Author, 2019)



Figure 46 Careless disuse of the fountain public park (Author, 2019)

4.2 Physical site considerations

4.2.3 Site complexities

4.2.1.a Current and previous functions of the site

King's Park Arts and Craft Market:

On the first Saturday of every month, artists and crafters from all over the country come and sell their products at stalls pitched at the Kings Park Rose Garden during the Volksblad Arts and Craft Market. Offering a large variety of traditional African arts, local brewers and winery stalls, portable putt putt setups and market food stalls (Gericke, 2016: 8)(Figure 47).

The arts and craft market has recently (2016) been relocated, because there are concerns about the welfare of the zoo animals, following a letter from the city manager TB Mea. This event brought an estimate of a thousand people to the site each month (Friis, 2016: online). The loss of the recurring monthly event, which drew people to the site, is of concern as it illustrates the potential of the site, which is negated by the state of the garden and the zoo.

Entertainment

Sunday performances were held during the 1930's, a typical performance would be the Spoorwegorkes which took place in King's Park. These performances would attract large crowds, and the site would be lit up by colorful lights as these performances typically took place during the evenings (Schoeman, 259).

Community groups

The park precinct also encouraged community participation, as groups such as the "Vriende van die Dieretuin" were formed. These community groups would come together to host events, educational tours, and courses as well as calling aid from the local residents when food scarcities struck the Bloemfontein Zoo (netwerk24, 2017: online) (Figure 48). The formation of such groups lead to local involvement in the park. It is important to establish care between city residents, and it's facilities (Jennings, et al., 2017; 72).

It goes without saying that the site functions as a public zoo and a public garden, although these functions have deteriorated significantly.

Volksblad
Kos & Kunsmark

LEKKER AVONTUUR TESAME MET **FRIENDS OF THE BLOEMFONTEIN ZOO**

Kom besoek hierdie unieke ervaring by die **BLOEMFONTEIN DIERETUIN!**

29 APRIL VAN 16:00-21:00

OPSOEK NA UITSTALLERS VAN UNIEKE PRODUKTE EN KOS

VOER VAN GROOT KATTE EN DEMONSTRASIES VIR OUD EN JONK

VEILIGE PARKERING BINNE-IN DIE DIERETUIN

Kontak Marie-Louise Smith by 083 287 8845 of ml@zigzagcreations.co.za
 oor hoe om as uitstaller betrokke te raak

Toegang : R15 vir volwassenes, GRATIS vir kinders onder 12 jaar



Figure 47 Arts and craft market photos (Gericke, 2016: 8)



Figure 48 Food for the zoo (netwerk24, 2017: online)

Precedent studies on current and previous functions

Precedent study:	Jamie Hurd Amphitheater
Primary function:	Recreation
Location:	West des Moines, Iowa, United States
Architect(s):	Confluence architectural firm
Year:	2006

Amphitheater planned for West Des Moines will be called the Jamie Hurd Amphitheater. The amphitheater will include lawn seating for musical performances and other entertainment and community events. The canopy of the stage directs sound to the seating area.

Hosting functions such as:

Campus, school, district and community performances and events.

Fund Raises and fun walks.

Private rentals such as weddings and recitals

Field trips and library programs

Fitness programs

The amphitheater holds about 2,000 people and is located on a natural hill next to the pond.

(Norvell, 2018: online)

This precedent is applicable to the design proposal as a functional example of what an amphitheater should provide to local communities. The design proposal will include an amphitheater as to make provision for recreational activities in King's Park, as an appropriate historical function in the 1930's (Schoeman, 259).



Figure 49 Jamie Hurd Amphitheater (Norvell, K. 2018: online)

Precedent study: Mojo Market
Primary function: Public Market
Location: Sea Point, Cape Town, South Africa
Architect(s): Megan Grauso of Indigo Fusion
Year: 2016

Mojo Market is curated to offer various mixtures of lifestyle, food and retail to the public. The owners of Mojo Hotel, which is located above the market, extended the experience of the hotel for their guest and to give Sea Point residents an engaging retail and leisure space (Visi, 2017: online).

The hybrid building offers 80 stalls for food ranging from local, fresh and healthy to exotic international fare, and retailers selling clothing, gifts, jewelry and homeware. The retail area engages with the pedestrian by facing both inward and outward, this was done to emulate the community hub of the town square (Visi, 2017: online).

This precedent applies to the design proposal as an example of a functional market within the city that engages the public, tourists and residents with the marketplace. The design proposal will include a market place to provide this lost function back to the public.



Figure 50 Mojo Market(Visi, 2017: online)

4.2 Physical site considerations

4.2.3 Site complexities

4.2.1.b Significant Features

There are several of existing structures on the site ranging from storage spaces and animal cages, and these structures provide clues to an appropriate design approach. These structures and built features include cages and movement walkways within the Bloemfontein Zoo, as well as significant historical walkways, statues and fountains of the King's Park Rose Garden.

- These structures should be respected and addressed in the design proposal in terms of cultural, historical significance and conservation requirements.
- Historical structures can be reinterpreted in a contemporary manner.

The significant features on the site were identified and investigated appropriately. These identified features will lead to the main development of the design approach, a brief descriptions follow:

1. Organism of the site: In chapter 2 , the organism of the site was introduced as something that functions as a small but critical part of the urban eco-system organism of the city. This statement motivates the use of city parks as a natural 'organism' in relationship with its man-made surroundings Harriet Jordan (1994: 85-86) defines the park's original function as "large public spaces operating as the 'lungs' within crowded cities or towns". The chosen site was investigated as a fossil found in King's Park/Bloemfontein Zoo, with the rock cages forming the vertebrae of the backbone, the axis as the main artery, and the surrounding green space as the diaphragm. Illustrated in Figure 51, the fossil skeleton of an eland (also first animal introduced in the park in 1906 (Schoeman, 1981: 182)) represents the fossil in the site. These aspects guide the individual function of the design proposal layout.

2. Layers of the site: Individual metaphorical layers found on the site were identified, these layers uncover the history of the site through investigating individual aspects. These aspects reveal the historical use of the site, mapping these individual aspects creates a visual layer of change. This change has the potential of guiding the historical appropriation of the design proposal on-site, the identified layers are a map, buildings, cages and paths (Figure 53).

3. Footprint of the site: The largest feature on the proposed site is the dolerite rock cages, these cages protrude and penetrate the ground. The cages form a visual footprint, which in turn guides the footprint of the new proposed buildings and programme (Figure 52).

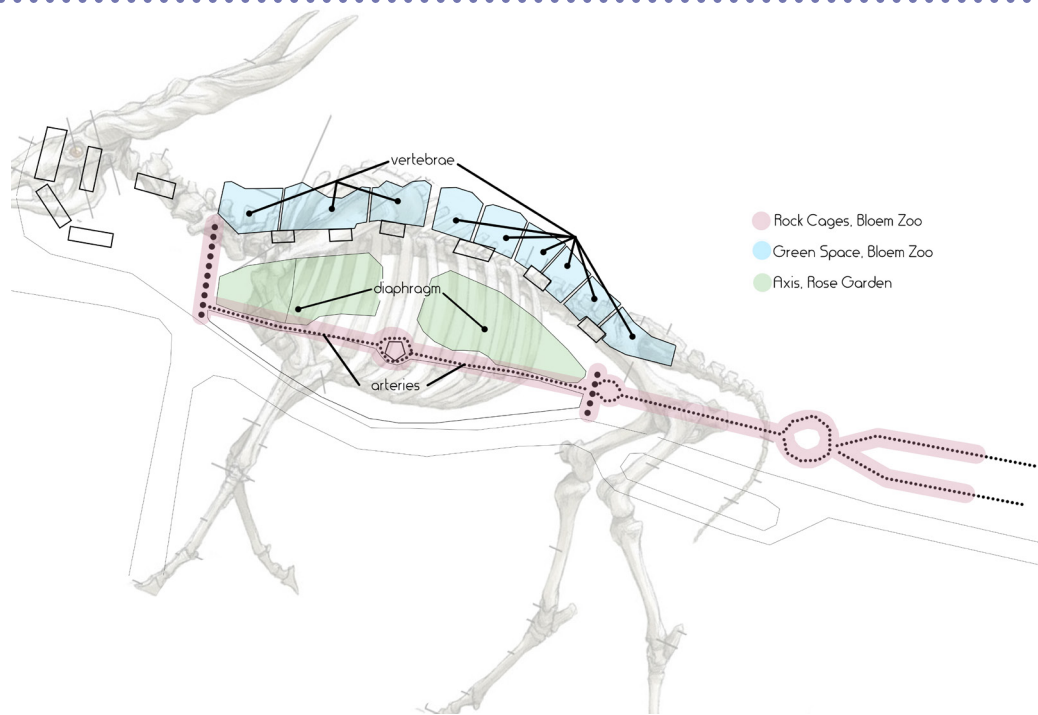


Figure 51 Organism of the site (Author, 2019)



Figure 52 Footprint of the site (Author, 2019)

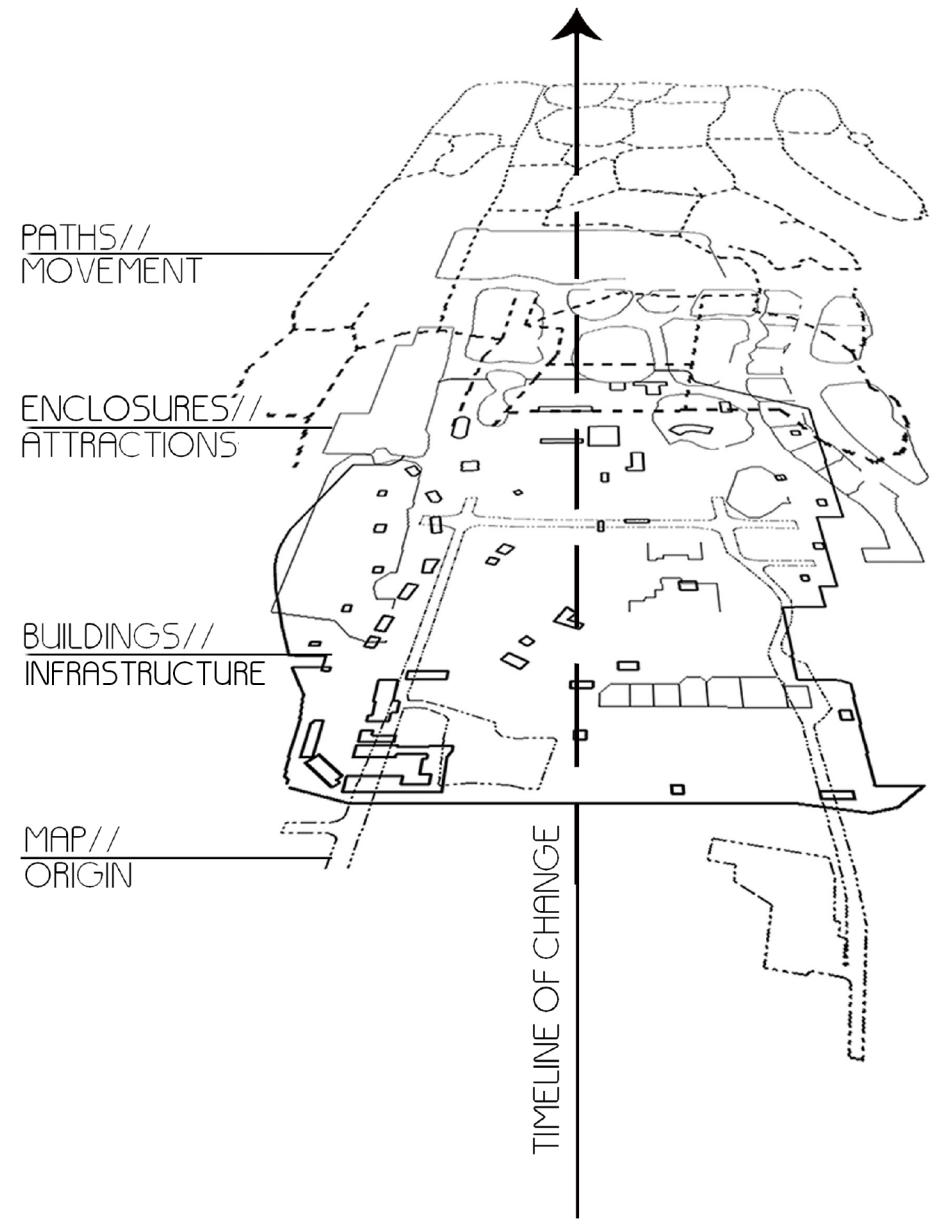


Figure 53 Layers of the site (Author, 2019)

4.2 Physical site considerations

4.2.3 Site complexities

4.2.3.1.c Organism of the site

Artery

The axis created by the Rose Garden design creates a line through the site. This axis line is an integral part of the site, as it connects the zoo with the Rose Garden, although it has been made absolute during the founding of the zoo in 1906 as it has been fenced off (places, 2019: online). This walkway is linked to the original urban planning of the city, and in 1990's served as an orientation guideline (Auret, 2016: 198)

Diaphragm

The lungs are the forgotten breathing space on site, as this used to be garden space, but with the establishment of the Bloemfontein zoo in 1906, it has changed to house animal cages and was sectioned off from the rest of Kings Park Rose Garden (places, 2019: online). They allow for the intervention to breathe new life into the system of the chosen site. Harriet Jordan (1994: 85–86) defines the park's original function as large public spaces operating as the 'lungs' within crowded cities or towns.

Spine

The rock cages can be seen as vertebrae to the spine that is the life force of the chosen site, introduced in 1906 during the establishment of Bloemfontein Zoo (places, 2019: online), these cages become the largest imprint within this area. These imprint act as a backbone to the chosen area of the site, guiding the layout and placing of the design approach.



Figure 54 Organim of the site (Author, 2019)

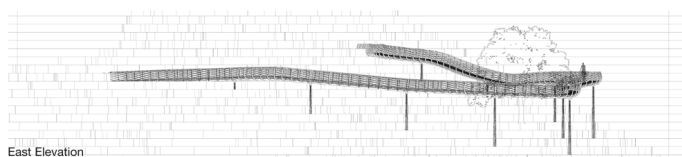
Precedent studies on Organism of the site

Precedent study: Boomslang Walkway
Primary function: Celebrate nature
Location: Kirstenbosch National Botanical Garden, Cape Town, South Africa
Architect(s): Mark Thomas and Henry Fagan Cape Town architect Mark
Year: 2013

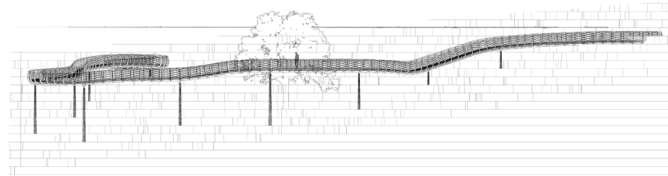
A sinuous wooden walkway meanders through the treetops of the botanical garden of Kirstenbosch, built to celebrate the centenary of the gardens. The walkway provides a different vantage point of the garden's arboretum with two widened spots for viewing. Named after a species of indigenous snake, the crescent-shaped path cross the undulating terrain of the site (Dezeen, 2014: online).

The concept derives from the terrain, being organic in shape, the path starts by running between the trees winding through the trees and finally sailing above the tree canopy. Trees on site determined key locations for structural support, and holes were cut in the decking to allow trees to emerge, special paint that attract algae growth was used and the railing aim to act as a trellis for creepers to minimize disruption and increase integration (Dezeen, 2014: online).

The precedent can be applied to the organism of the site as an artery, an axis line that connects the broader context of the site with the user and walkway that links the different parts of the site organism.



East Elevation
1:200



North Elevation
1:200



Figure 55 Boomslang plans and photos (Author, 2019)

Precedent studies on Organism of the site

Precedent study:	Heritage Museums & Gardens
Primary function:	Beautiful entrance
Location:	Sandwich Village, Massachusetts, United States
Architect(s):	Brian Laverriere
Year:	2017

Heritage Museums & Gardens is a premier public garden featuring a 100-acre property located in historic Sandwich Village, Massachusetts. Heritage boasts beautifully landscaped gardens, an extensive network of nature trails, and special exhibits in the museum galleries (Garden Club, 2017: online).

The entrance to this historic property has recently been redesigned to create a green parking area, offering a more beautiful entry for visitors and much-needed stormwater infrastructure. There is a growing interest in green parking lots that reduce environmental impact, improve safety while being designed with appealing aesthetics in the process. The Heritage Museum & Gardens project is an excellent example of this multi-functional approach (Garden Club, 2017: online).

The precedent can be applied to the organism of the site as lungs, creating greater access that celebrates nature will breathe life back into the decaying site, allowing the rest of the site organism to thrive.



Figure 56 Heritage Museums & Garden parking and entrance (Garden Club, 2017: online)

Precedent study: Lerida Estate Winery
 Primary function: Site considerations
 Location: Lake George, New South Wales
 Architect(s): Brian Laverriere
 Year: 2003

Lerida Estate Winery was founded in 1997 on a lot by the motorway from Sydney to Canberra, where it coasts Lake George, a dry lake which is periodically flooded, sometimes for years (Corda, 2017: online).

Located halfway up the hill, the winery appears, when seen from afar, as the final part of a virtuous process which begins at the water reserve in the lower part, to then proceed through the vineyards to finally reach the building where the production takes place. The path to the building takes the form of a Peripatetic walk, metaphor of the wine production, from which one may enjoy the view of Lake George, conceived as ideal projection, on the landscape, of the metaphorical walk commenced from that point (Corda, 2017: online).

The precedent can be applied to the organism of the site as the spine, a strong functional programme that addresses the complexities of the site accordingly. In the precedent, the steep slope of the site is softened through the design, to create a coherent experience from the bottom of the slope to the top. This can be applied to the spine 'vertebre' of the site organism to soften the level changes that the rock cages have on the site. This will allow for a cohesive backbone of the design that creates the opportunity for the rest of the organism of the site to function comfortably.

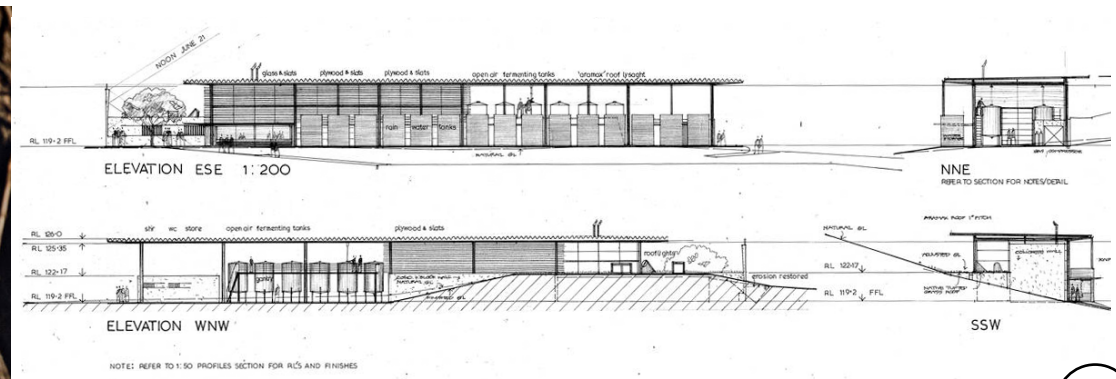
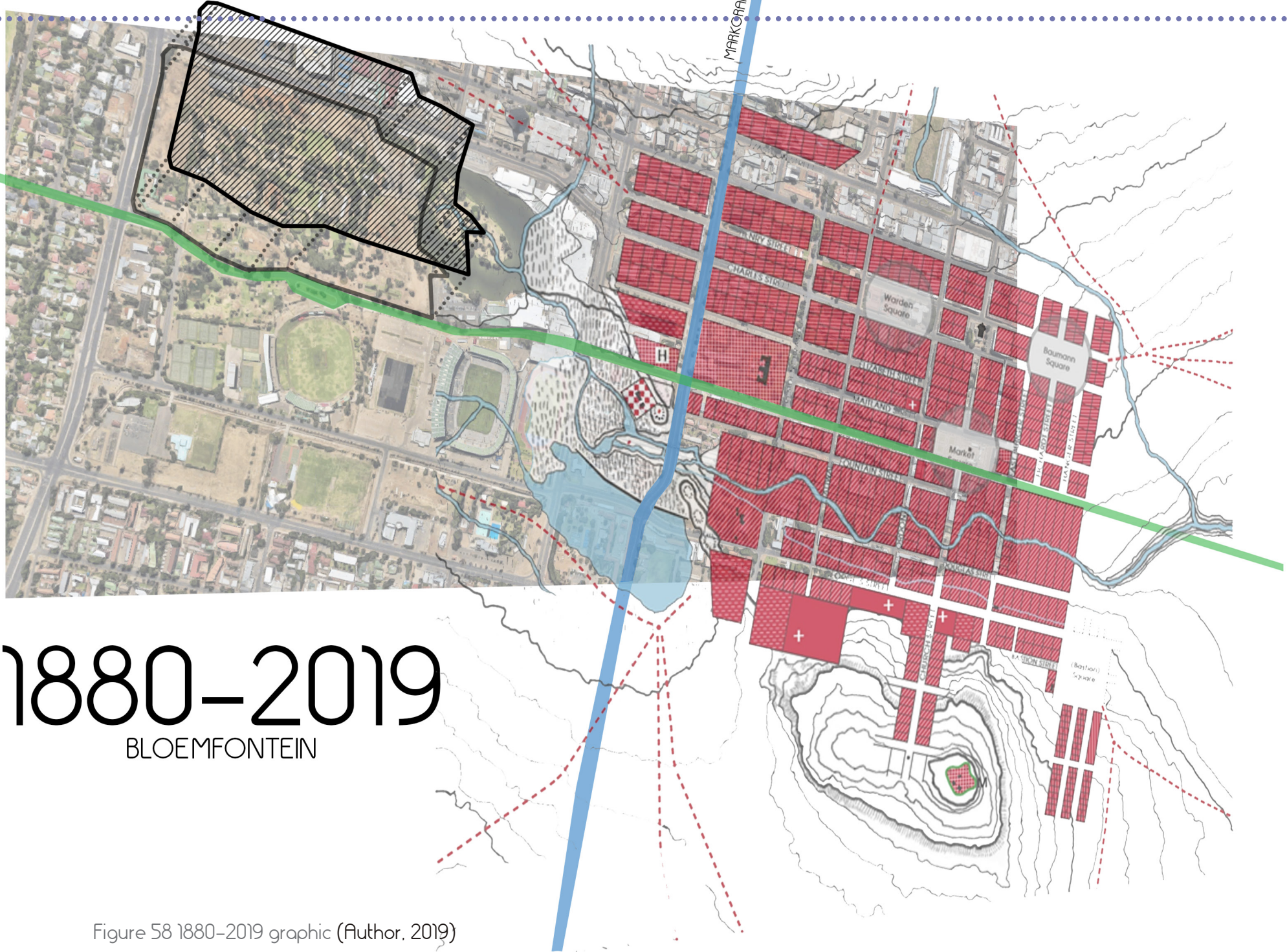


Figure 57 Lerida Estate Winery photo and elevation (Corda, 2017: online)

ST ANDREWS ST

MARKORRAFF ST



1880-2019

BLOEMFONTEIN

Figure 58 1880-2019 graphic (Author, 2019)

4.2 Physical site considerations

4.2.3 Site complexities

4.2.3.d Layers of the site

Map/ Origin

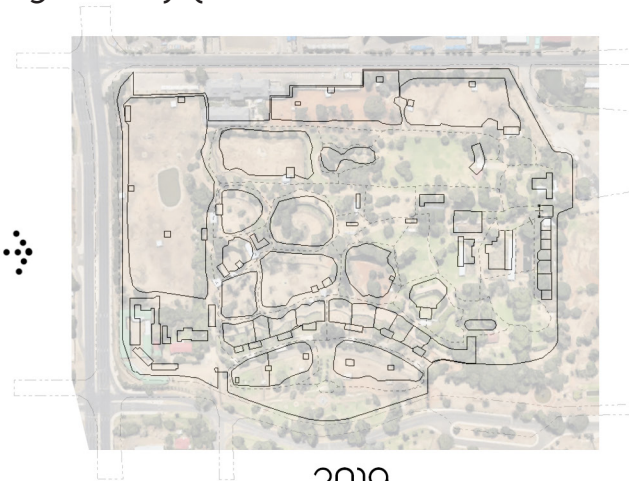
This first layer holds the form and lay of the land that Bloemfontein was built upon, as the "bottom" layer is the original shape of what land and nature dictated how humans cared to settle here. This layer encapsulates history in the most primitive form, guiding the first notion of the orientation and facilitation of the city lines (Figure 60) (Auret, 2016: 199–202).

The placement of the developing city of Bloemfontein was influenced by four fundamental components. These elements were: Naval Hill, Signal Hill, Fort hill(southern side) and the dolerite ridge found between Signal and Fort Hill (Figure 60) (Auret, 2016: 199–202; Auret, 2019: 72–79; Schoeman, 1987: 182).

The accessibility of water played a significant role in the early development of the city, becoming a cardinal influence in the immediate orientation of street planning, flowing in an east–west fashion conducted by the direction of Bloemspruit. This axis was accented by another north–south axis line formed by the prominent geological features of Naval and Fort Hill. The order created by this axis were however, not thoroughly followed by the first settlers, instead the built structures were clustered around the Hills. In 1880 the three squares Warden, Market and Baumann Square were established which created a clear urban order, and finally, in 1906 the Bloemfontein Zoo was established in Kings Park (Figure 60) (Auret, 2016: 199–202; Auret, 2019: 72–79;



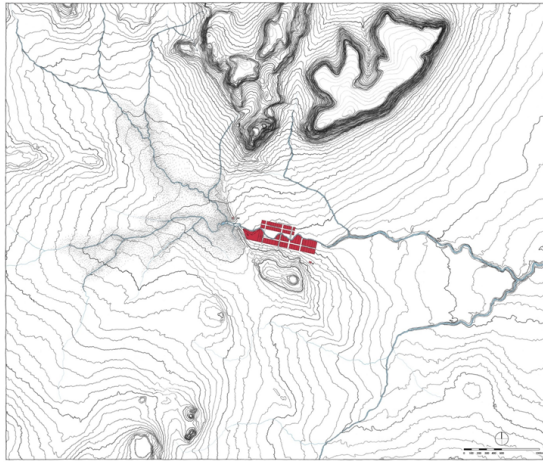
~1840



2019

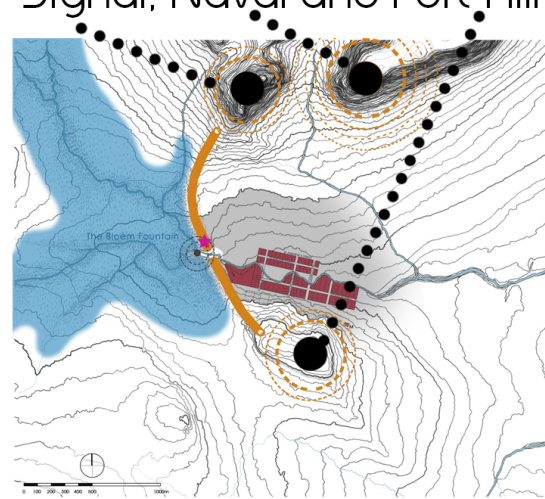
Figure 59 Past and present map (Author, 2019)

Lay of land



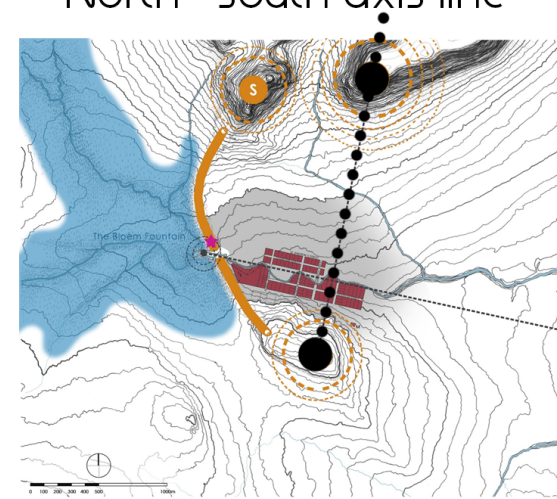
1848

Signal, Naval and Fort Hill

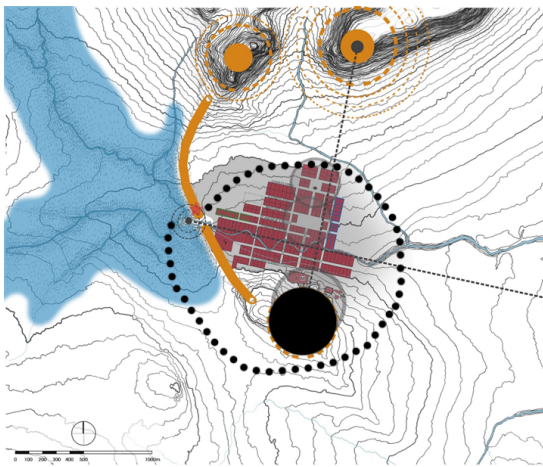


1848

North-south axis line

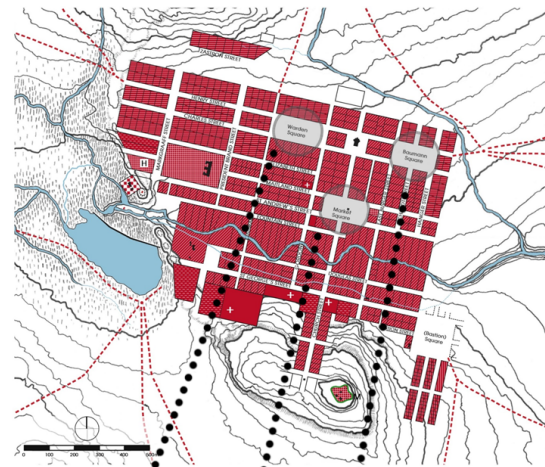


1848



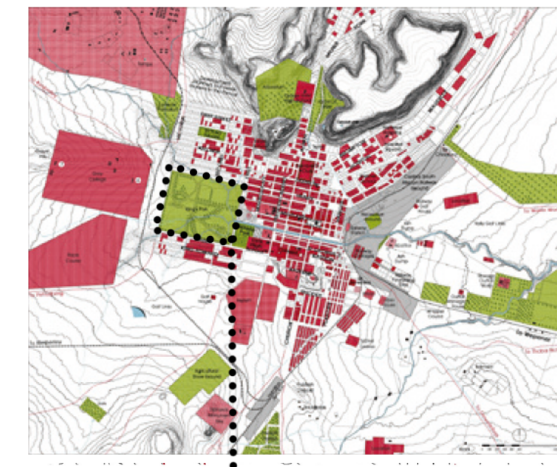
1850

Clustered around Hill



1880

Wärden, Bauman and Hoffman Square



1906

Bloemfontein Zoo established in Kings Park

Buildings/ Infrastructure

The site consists of three major parts; namely the Bloemfontein Zoo, the Bloemfontein Rose Garden and the Loch Logan Waterfront. The chosen area of the site exists on the southwestern corner of the site, which is in part Rose Garden and part Zoo. The site was selected to accommodate an intervention of an urban garden/park centre.

This layer is the first layer following the map/origin layer, indicating institutional facilities that have been added over the years. This layer is an indication of interpretations of built form upon the site, and serves as a historical map to what the inherent meaning to the spaces were (Figure 61).

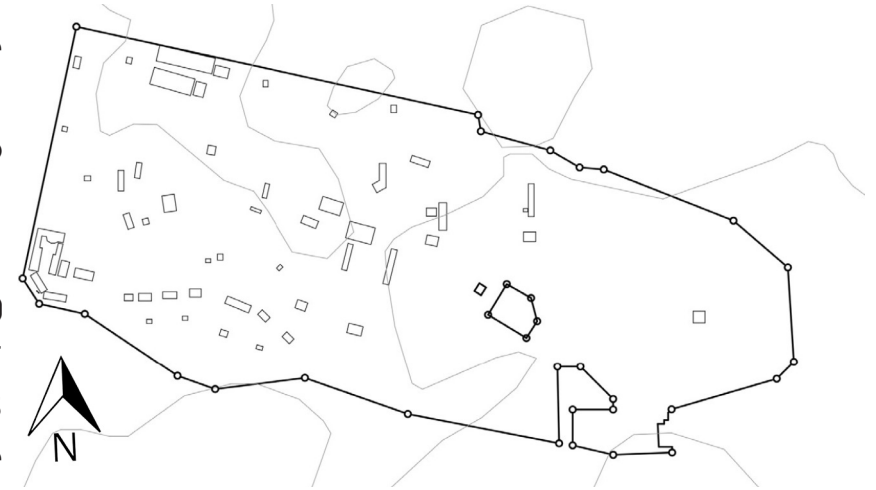


Figure 61 Buildings on site (Author, 2019)



Figure 62 Photos of buildings (Author, 2019)

4.2 Physical site considerations

4.2.3 Site complexities

4.2.3.d Layers of the site

Cages/ Enclosures

Cages/Enclosures: This layer is the current activities found on the site and the facilities that occupy the structures. The built form on site is presently a public zoo, with attractions for tourists and city residents. This layer outlines the cages and habitats that were created through the history of the site to what it is today (Figure 63).

The main function of the site(park) is threefold: Public Zoo, Rose Garden and shopping center. The largest part of it is an interpretation of nature within the urban context, the zoo. This interpretation has fallen out of favor. Animals in captivity have become a concern for animal rights activists and environmentalists. Many zoo opponents hold that wild animals should not be kept in captivity for human benefit, Dale Jamieson argues that animals taken from the wild are deprived of the opportunity to behave naturally (Jamieson, 2017: 108). The question becomes one of the conservational value to the species that are confined within these enclosures, and under what conditions they are being held, are these conducive to their physical and psychological wellbeing?

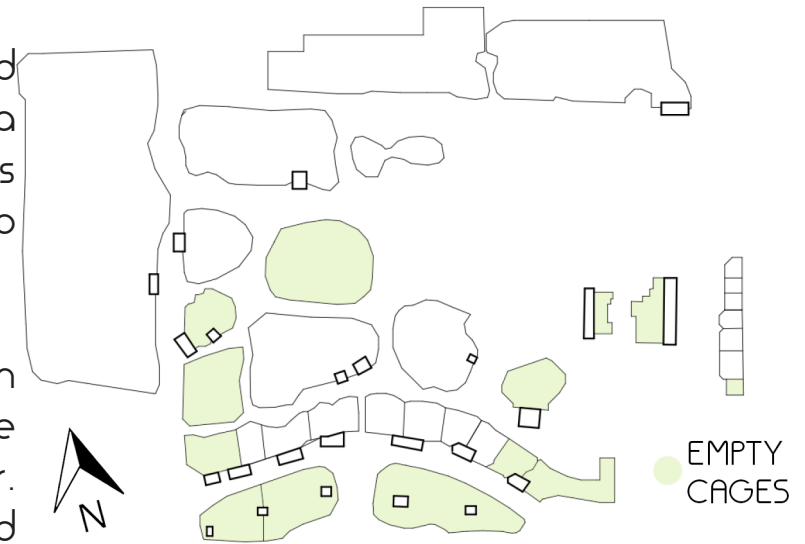


Figure 63 Photos of buildings (Author, 2019)



Figure 64 Photos of enclosures (Author, 2019)

Paths/ Movement

Paths/Movement: The park was known to be a central part of the social hub in central Bloemfontein since the 1910's. With additions being made over the course of its established date up to 1930's, from water fountains, gardens and nurseries, to animal shelters and forestry. The site became a popular attraction and would hold up to 5000 people on busier days. Kings Park has been described as the embodiment of the "planting spirit" of its residents, playing an essential role in the development of the character of the city (Schoeman 1987, 180).

This layer is an estimation of how the facilities and attractions on site are being used and accessed in reference to the built structures. Based on Lynch (1960), paths are considered as the most critical elements in urban design and it is the first element designed in planning. The path is defined as the passages that experience from people's movement. These lines are pathways, walkways and meanders through the site that links the clusters together. This layer is an interpretation of the present-day use of the site to the people of the city, the way it operates and the way the facilities are approached (Figure 65).

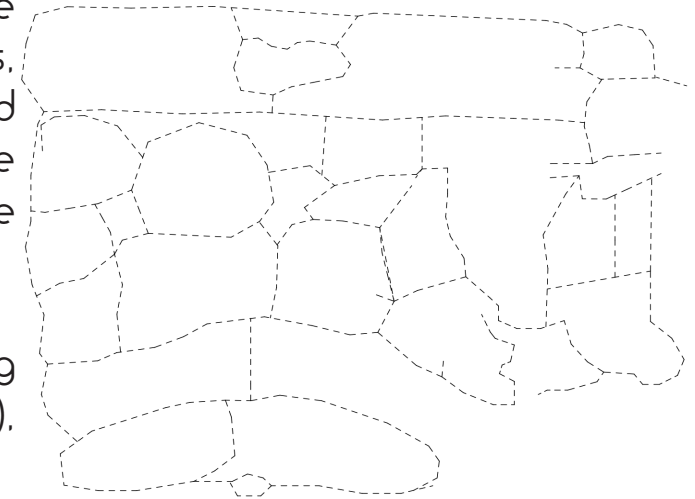


Figure 65 Movement, path on site (Author, 2019)



Figure 66 Photos of Movement, path on site (Author, 2019)

Precedent studies on Footprint of the site.

Precedent study:	Dudley Zoo
Primary function:	Conservation of enclosures
Location:	Dudley, England
Architect(s):	Berthold Lubetkin, conservation Stuart Tappin and David Platts
Year:	1939, conservation 2010

The Zoo opened to the public on 18 May 1937. It contains 12 modernist animal enclosures and other buildings designed by the architects Berthold Lubetkin and the Tecton Group. The 12 listed Lubetkin-designed concrete structures at Dudley Zoo, built between 1936 and 1937. As time has moved on and zoological practices have changed, some of the Tecton structures have become unused and left to serve only as monuments. The lack of use has led to poor upkeep and deterioration (Dudleyzoo, 2019:online).

An approach based on conservation was adopted. The traditional concrete was used for the majority of repairs and carbon fibre were added to stiffen large cantilevered viewing platforms. The tecton structures were then reinterpreted to provide a programme which would sustain future use. (Dudleyzoo, 2019:online)

The precedent can be applied to the footprint of the site (rock cages, Figure 64), as the conservational approach of the historic cages of Dudley Zoo (Bear Pit, Figure 67) is relevant to the design proposal. The application of a functional programme to the unused and the reinterpretation thereof, cages to sustain future use is also relevant to the proposed site.

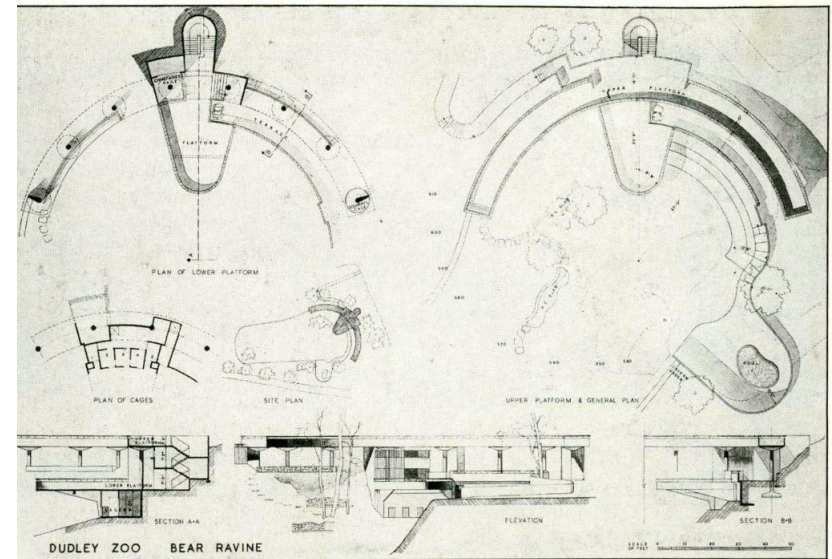


Figure 67 Bear raavine, Dudley Zoo (Dudleyzoo, 2019:online)

4.2 Physical site considerations

4.2.3 Site complexities

4.2.3.d Fabric of the site

Solid and void space relationship

Human occupation of the site is steadily declining, with the Rose Garden is empty most days and the Bloemfontein Zoo only has a trickle amount of visitors. The traces of human use is fading and leaves an ugly scar on the site. The park is isolated amid the hustle and bustle of the city, almost abandoned. The animal cages and garden features are static behind the blur of movement around its boundaries (Figure 68).

– Incorporating landscaping in the design proposal, the site can extend out of its dormant state and create an opportunity for sustainable and inclusive design.

Textures on site

The textures identified on-site generally belong to the structures and landscaping of the park/zoo, the institutional buildings weren't necessarily looked at as a design influence, as the proposed design will mainly focus on landscape elements.

The primary material language is built from the following components:

Steel: The apparent steel textures on-site exist in the animal cages and fencing, while the Rose Garden has more ornamental usage of steel in the form of a steel pergola (Figure 70 and Figure 71).

Stone: Local dolerite rock is used throughout the park, forming rock enclosures, small hills and pathing features, and water fountains (Figure 69 and Figure 72).

Wood: Gumpoles are used as a secondary aesthetic structure within the Bloemfontein Zoo as a trellis, features within animal enclosures and fencing (Figure 73).



Figure 68 Restricting fence (Auhor, 2019)



Figure 69 Dolerite enclosure (Auhor, 2019)



Figure 70 Ornamental steel use at picnic area (Auhor, 2019)



Figure 71 Steel primate cages (Auhor, 2019)



Figure 72 Stone fountain (Auhor, 2019)



Figure 73 Timber use in Zoo (Auhor, 2019)

Precedent studies on fabric of the site

Precedent study:	Warren Skaaren Environmental Learning Center
Primary function:	Educational
Location:	Texas, United States
Architect(s):	Jackson & McElhane Architects
Year:	2003

The purpose of the Warren Skaaren Environmental Learning Center at Westcave Preserve is to serve as a wilderness classroom in an established preserve in Central Texas (Architizer, 2019).

The design makes space that creates the feeling of interconnectedness with the indoors and outdoors as to open up to the surrounding preserve. The building aims to create awareness of the basic environmental systems that we live in. This is done to simplify the complexities of the natural sciences and ecology to their most basic components, such as protection of the soil and conservation (Architizer, 2019)

This precedent is applicable to the design proposal in the way that local rocks were used for the walls as a large tectonic element, with the steel structure of the roof touching lightly on the heavy tectonic system. This can be interpreted in the design proposal with the rock cages forming the tectonic element and the building structure lightly placed on top.

Figure 74 Waaren Skaaren Education Center(Architizer, 2019)



Sure,
it may have a dry
and dusty appearance,
but Bloemfontein is home to the
Free State's only botanical garden
the tropical oasis, Orchid House. If
you need to put a spring in your step,
colourful flowers are always in bloom at
King's Park, where you can take in the
popular monthly art markets and all
that they offer (South Africa,
2019: online).

These words fall empty on dead
plants, trash heaps and unsafe
public space. The "City of
Roses" deteriorated to a wilted
weed (Figure 42) (Mtebele,
2018: online).

Original Research Question:

How can social justice have a positive impact on public engagement within the urban fabric of Bloemfontein?



Revised Research Question:

How can facilitating urban ecology services to disadvantaged communities through grafting a new green lung impact the public of Bloemfontein?

Figure 75 Pergola – remnant of historic Rose Garden (Auhor, 2019)

4.3 Theoretical site consideration

4.3.1 Social Justice

Zoo Protest: Contention example

Khoisan activists entered an animal cage in the Eastern Cape with the intent of sleeping in it for several days (Figure 76). They protested against animal cruelty within the East London Zoo. The activists believe the idea of the zoo's to be outdated, to be banned and written out of municipal law in South Africa at large (Sain, online: 2019).

The group's spokesperson, Christian Martin, has stated that the zoo needed a radical re-think about the ongoing suffering of animals in captivity. Stating that nothing substantial was done on behalf of conservation awareness or education in South African Zoos (Sain, online: 2019).


Similar protests against animal captivity have been taking place at the Johannesburg Zoo, as ethics regarding animal welfare is questioned by the NSPCA (news24, 2019: online)




Figure 76 (Sain, online: 2019)

“As the Khoi-San people, we strongly condemn this practice and echo the call for the immediate relocation of the jaguar and other animals and the immediate closure of this zoo. The Khoi-San further condemns undomesticated, non-human creatures to be displayed for others curiosity and amusement, as it is clear that it is only for monetary gain. (Sain, online: 2019)”


Contention Bloemfontein Zoo




Poor Animals
Reviewed 20 June 2019
Very dirty zoo. Few animals. No Elephant, no Giraffe, No Crocodile, a few bucks, expensive to visit as a family.
Date of experience: June 2019
4 Thank barendb2018




Children Attraction
Reviewed 29 January 2018
We actually found the zoo almost empty, no much animals as for children to enjoy their curiosity. There was no power and no way to see the reptiles in their rooms. There was suppose to be a guidance at the entrance when people pay as... [More](#)
Date of experience: January 2018
9 Thank 111victor




Disgraceful
Reviewed 24 May 2017
Not a fan of zoo's - Bfn Zoo is really sub standard and the cages etc have gone backwards and I will not take friends that visit the City there
Date of experience: February 2017
101 Thank trevor312564



Sad story
Reviewed 27 January 2017
This is really bad and the place is not looking after Bloem needs to reclaim back the famous Zoo in the middle of the city , they need to be proud - I feel sorry for the animals there
Date of experience: January 2017
13 Thank NadiaB1380



Upsetting
Reviewed 18 July 2017
This zoo is very under-kept and it was rather upsetting to see the animals in this condition. It is dirty, the animals as such did not seem underfed or unhealthy. The general set-up was a bit disturbing. Especially since the hotel have wonderfully kept gardens... [More](#)
Date of experience: June 2017
1 Thank 836adeleh



Out dated
Reviewed 25 May 2017
Looking its age and an outdated concept, sad to see the animals particularly the big cats confined to such small areas, I know the staff try their best but a radical rethink is required. Bloem has enough reserves nearby to think about moving the animals... [More](#)
Date of experience: May 2017
1 Thank Noel G

The contention on the site can be derived from the fact that zoos are becoming a more and more controversial subject, combined with the decaying state of King's Park. The site is not a safe place to enter, there is minimal movement in the area and the facilities are barely being used. This leads to the thought of an intervention on site, with a new and contemporary interpretation of nature within urban settlements to facilitate the lost function of the park back to the people (residents and tourists) in contrast Naval Hill's Frankil Reserve functions well in the city and is very popular with runners, visitors and tourists.

Figure 77 illustrates the public's concern and contempt with the park and the zoo, as it is in a state of disaray. The public is calling out for a change and intervention, a cry for help to the municipality of Manguang.

The intervention can be addressed through a set of principles or a theorhetical approach. Social justice covers multiple aspects that become applicable when linked to the site and the goals that need to be achieved. Therefore social justice principles are employed as tools to develop a design.

Figure 77 Bad reviews (Tripadvisor, 2019:online)

4.3 Theoretical site consideration

4.3.1 Social Justice

New interpretation

The new interpretation, or re-invention, of the site's main goals, is to re-introduce the park to the city through appropriating the park with social justice principles; Access, Equity, Rights and Participation (Department of Health, 2019: 7.1). The design proposal aims to incorporate these aspects into the site through the functional programme that allows the public to interact with the site again, in relation to these principles. A community orientated municipal ensemble is required, which accommodates the public in a humane and approachable manner. The functional requirements of the proposed reinterpretation of the park into an urban garden are divided into four categories of social justice principles.

The guideline and strategies are relevant to the proposed site and include (illustrated by Figure 80):

Access (greater equality of access to goods and services).

- King's Park is not open and accessible, nor is the Bloemfontein Zoo.
- The aim is to open the site to the public.

Equity (overcoming unfairness caused by unequal access to economic resources and power).

- The park was not accessible to all over its history (sahistory, 2019: online)

Rights (equal effective legal, industrial and political rights).

- Animal welfare rights. Animals in captivity.
- Access and Equity for the public through design proposal in the park

Participation (expanded opportunities for real participation in the decisions which govern their lives)

- Re-engage public participation with the park.

(Department of Health, 2004: 7.1)

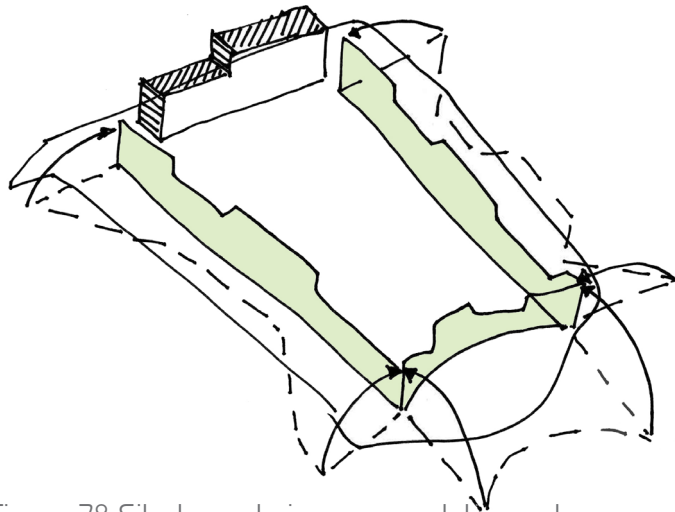


Figure 78 Site boundaries encapsulating outer city confines (Author, 2019)

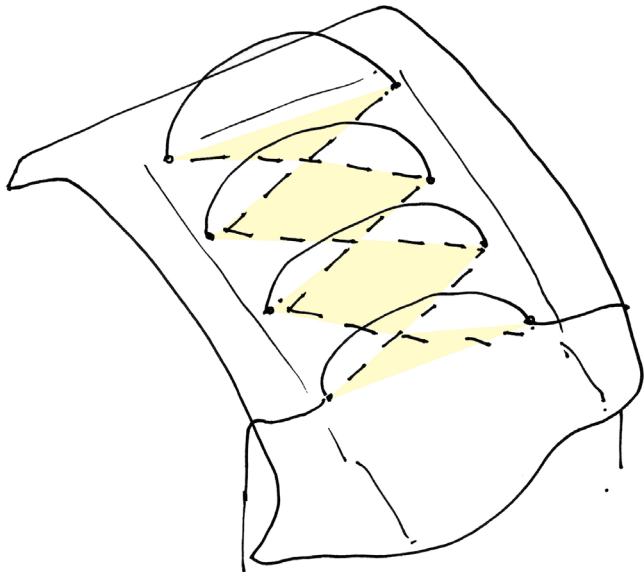


Figure 79 Tension on site, harbouring connection of man and nature (Author, 2019)

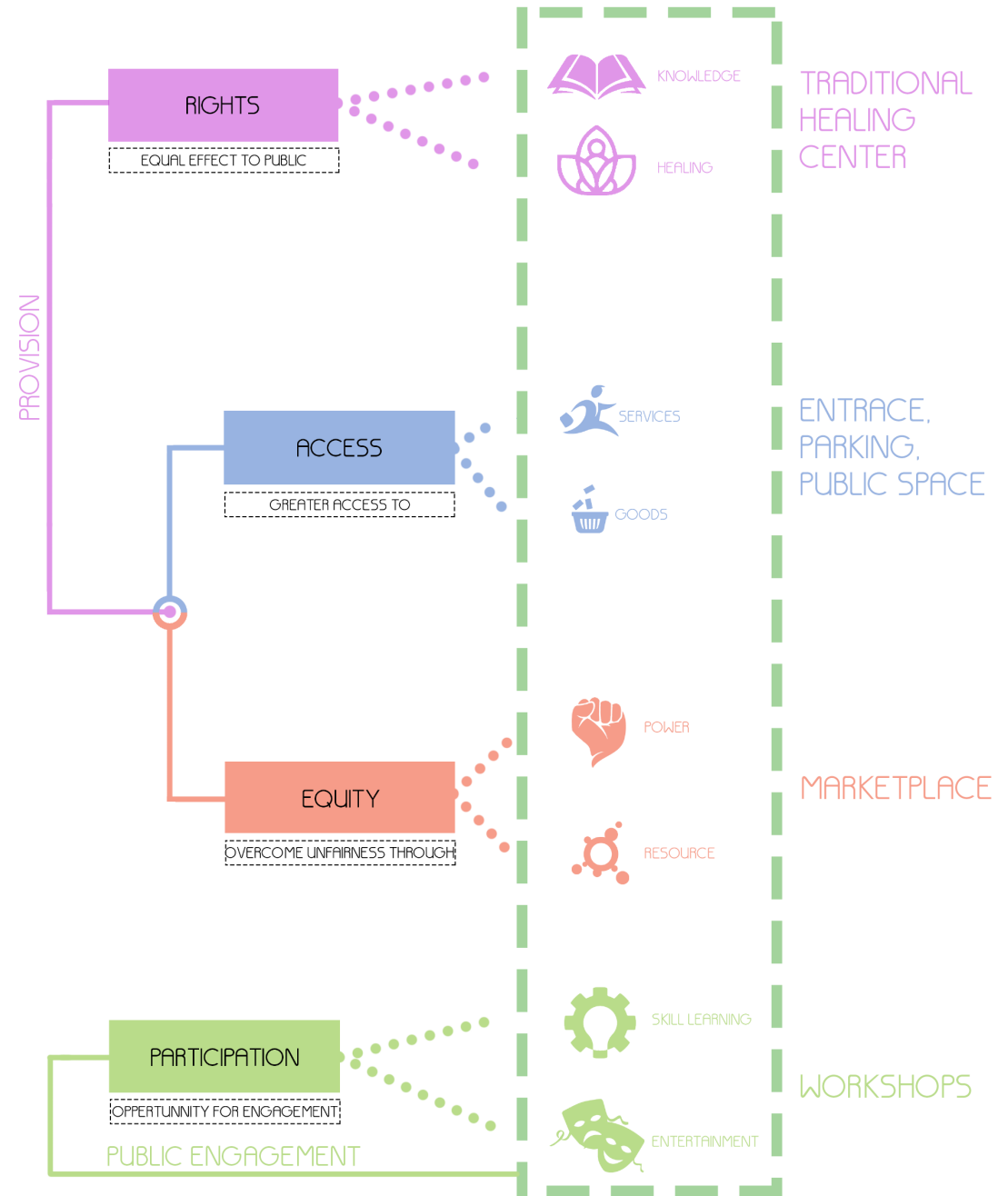


Figure 80 Guideline and strategies illustrated (Author, 2019)

4.3 Theoretical site consideration

4.3.2 Urban Ecology

Introduction

Natural resources and the conservation and management thereof becomes vital with the continuous gravitation of population to urban areas. The concept of sustainability science explores the interaction between environment and human systems. Landscapes and urban green spaces play a pivotal role in this collective vision (Wu 2013). Landscape sustainability can be defined as the long-term potential of landscapes to provide, enhance, and support human well-being. Managed and un-managed green spaces (landscapes) have been proven to positively improve human well-being (Hartig et al. 2014). A green space that is open and accessible could positively enhance the Bloemfontein CBD and surrounding areas.

Environmental and social justice issues are involved in the limitation of urban green spaces and their respective health benefits (Jennings et al, 2012). Social justice views, specifically, aim to elucidate the limitation of green spaces that arose from the lack of policies to correct unjust conditions. The extent of public participation and access of all socioeconomic groups to green spaces are greatly affected by the spatial and geographical distribution. Some studies have highlighted the inequalities in access to urban nature, these studies have found that disadvantaged areas and neighborhoods have less access to public green spaces (Boone et al. 2009; Wen et al. 2013) an absence of fewer amounts of vegetation cover (Pham et al. 2012; Tooke et al: 2010) and fewer street trees (Landy and Chakrabort 2009). A key variable to environmental and sociological change are urban ecosystems. A better understanding of this relationship, and the necessary approach to practical concerns, can resolve these inequalities.

Urban ecology issues involve concerns related to social justice that has an implication on human health and well-being. The study of urban ecology includes different infrastructures, social processes and ecological feedback within the greater organism and city dynamic, subsequently the concerns of public well-being regarding urban nature become a crucial component.

Ecosystem services

Green Infrastructure (GI) defines all parks, forests, community gardens and various types of private and public green spaces, locally and globally. Benedict and McMahon(2006: online: 7) describes GI as "An interconnected network of green space that conserves natural ecosystems values and function and provides associated benefits to human populations."

Generally, landscape ecology and design use GI as support a structure for environmental systems without focusing on the human health benefits. Socio-ecological principles define the entwining of human and environmental health benefits. (Jennings et al. 2017: 73) Our understanding of environmental challenges in our cities and how to resolve it can be informed by urban ecology, this becomes important as the success of urban ecology should not just be measured by scientific progress but also in terms of societal benefits (Jennings et al. 2017: 72).

The understanding of landscape sustainability includes framework elements such as; ecological processes, structural features, ecosystem services and landscape configuration (Wu 2013), these elements become important factors when gauging the impact of the green space on health and well-being (Jennings et al. 2017: 72).

4.3 Theoretical site consideration

4.3.2 Urban Ecology

Types of services

The understanding of landscape sustainability includes framework elements such as; ecological processes, structural features, ecosystem services and landscape configuration (Wu 2013), these elements become important factors when gauging the impact of the green space on health and well-being (Jennings et al. 2017: 72)

The direct and indirect influences of nature, or green spaces, on humans can be described by the concept of ecosystem services. Ecosystem services can be categorized by provisioning, regulating, cultural and supporting services (WHO 2005). Examples follow

-Provisioning Services: Plant material used in the making of food, clothing and natural resources.

-Regulating Services: The control of plant offspring and produce, conservation of genetics.

-Cultural Services: Benefits from nature that is not material, such as recreational use of green spaces, the economic advantages of the use of green spaces, as well as aesthetic and spiritual experiences felt through the observation and immersion in the natural environment.

-Supporting Services: This serves as a building block for the other services. These include biodiversity data, plant and soil information and life cycles. This service is necessary as a way to maintain resilient ecosystems (De Groot et al. 2010).

Precedent studies on urban ecology

Precedent study:	Central Park
Primary function:	Urban green space
Location:	Manhattan, United States
Architect(s):	Frederick Law Olmsted and Calvert Vaux
Year:	1853

Central Park is located in the center of Manhattan and is a great expanse of sculpted nature. The large swath of greenery was the first manifestation for a new urban vision that sought to introduce nature into the hear of industrial and commercial cities of the United States (Ranogajec, 2014: online).

Reformer William Bryant and co-designer Olmsted embraced urban nature. They wanted to better the lives of all city dwellers, by introducing nature as an antidote to the unsafe and unsanitary qualities of large cities. They knew that true nature was impossible in the middle of cities and opted to create a man-made, sculpted landscape to capture the best qualities of nature. The park was to be the "lungs of the city" and the introduction of nature would therefore "unbend" the nerves and tensions of the minds of the residents (Ranogajec, 2014: online).

This precedent applies to the theoretical consideration of urban ecology as a green space within the city that positively affects human health and well-being. The park is interconnected with the network of the city, and conservers natural ecosystem values as well as providing associated benefits to human populations.



Figure 81 New York, Central Park (Ranogajec, 2014: online)

4.3 Theoretical site consideration

4.3.3 Human health and well-being

Outcome of Ecosystem services

The link between urban ecosystems and public health has been documented through a variety of benefits, the more appropriate being aesthetics and engagement with nature, outdoor recreation and physical activity. Green spaces can play a definitive role in shaping healthy communities (Jennings et al, 2017: 74) and as mentioned, there is a clear need for green spaces in Bloemfontein centre to support healthy communities.

Larson et al. (2016a) investigated the influence of public parks on subjective well-being factors such as social, financial, community and physical domains. They found that variables such as park quantity, quality, and access had a positive link with well-being. In contrast to this, access to parks is a key factor for its success.

Inequitable access to green space, and their respective ecosystems services, has been investigated and found to relate to differences in health across disadvantaged areas and neighborhoods. (Jennings et al, 2017: 77) The unequal distribution of green spaces withholds the opportunity of the day to day exposure to green space, considering the provision ecosystem services can contribute, this uneven access should be avoided for the sake of the public. It has been found that areas with more coverage of green space showed an overall lower level of health inequalities. While providing these green spaces to the public is crucial considering the relief in inequality of access, it is still critical to design programs that increase exposure and promote the use in these locations (Jennings et al, 2017: 78), because these spaces need to be available, and also accessible.

4.3.3 Human health and well-being

Good green space

"Everybody should have access to good quality natural green space near to where they live" (Natural England, 2010: 5). A vast amount of evidence reflects the importance of the role of urban green space and its the impact on the physical, psychological, cognitive and social well-being of the public (James et al., 2015). Similarly, other researchers such as:

Keniger (Keniger et al., 2013) states that these health benefits are thought to be facilitated through mechanisms of:

- Stress reduction
- Psychological restoration
- Physical activity
- Improvement of the physical environment
- Promotion of social togetherness

and when, Kimpton (Kimpton, 2017) states three ways of conceptualising equal distribution.

- Accessibility: Distance to greenspace
- Provision: Greenspace cover within an area
- Population pressure: potential overcrowding of the space.

It is again clear what aspects of King's Park contribute to its current failing state, the lack of access, no involvement or participation on-site and no actively maintained green areas.

4.3 Theoretical site consideration

4.3.3 Human health and well-being

Provision of spaces

Mears states that, for green spaces to provide the mentioned benefits to the public they should adhere to the three ways of equal distribution to the people. These spaces will facilitate these benefits if they fall under three types, namely; Greenspaces that are publically accessible, green spaces that meet the criteria to have potential health benefits and greenspaces specifically catered to young people or children (Mears et al., 2019 p.127), therefore it is also critical to consider who will use the space. For example,

Children and young people have different requirements needed from greenspaces than adults. The spaces should pay particular heed to facilities that fit their age group. The inclusion of games and play are a necessity to greenspaces (Day and Wager, 2010; Jansson et al., 2016). There are traces of elements for children at the zoo, but as with other aspects, it has not been maintained and is also unused.



Figure 83 Unused play space Bloemfontein Zoo (Author, 2019)



Figure 82 Need for safe and sanitary play, Public Fountain space (Author, 2019)

Precedent study on human health and well-being

Precedent study:	Adelaide Zoo
Primary function:	Zoo re-introduction
Location:	Adelaide, Australia
Architect(s):	WAX Design
Year:	2015

WAX Design has brought nature play to the Adelaide Zoo, connecting children to nature through play and enhancing visitor experiences. The project aims to connect parents, children and caters to nature through play. The values, aspirations and philosophies of Adelaide Zoo are reflected through social inclusion, education and a better understanding of the natural world. The project uniquely accommodates all members of the community through the provision of inclusive play (Landezine, 2019).

Sustainability principles were embedded in every aspect of the project. Significant trees were retained and nurtured with the removal of surrounding infrastructure and the use of permeable surfaces. Many elements of the site were reclaimed and repurposed, including rocks, logs, seats, sculptures, paving, mulches, and soils (Landezine, 2019).

This precedent can be applied to the theoretical consideration of human health and well-being. The project aims to include children through the use of play in nature, as well as be publically accessible and to positively affect the well-being of the inhabitants of the site. These aspects make for good green space.



Figure 84 Adelaide Zoo (Landezine, 2019)

4.3 Theoretical site consideration

4.3.4 Concept global

Site meaning to city

Berleant (2010) states that the global effects of climate change, and our reluctance to realise what is an ongoing event in our ecosystem, is inhibiting our progress from intervening and finding solutions. Humans are at the nucleus of these causal relationships and are slowly becoming aware of the effects thereof. We inhabit this world and are the primary factor on both the local and global scale of change. The idea of a global ecosystem encapsulates the idea of a complete range of human actions and consequences. With these actions, we strive to balance this ecosystem within a narrow margin of play in a field of a universal scale (Berleant, 2010).

Realistically, nature can be found outside of human settlements and societies. To interact and experience the greater outdoors, one would have to go out and visit it. Figure 85 represents this reality, with humankind and nature being divided by the barrier of urbanity. The reality of this is that urban structures create a barrier between the untamed wild and civilisation, a sort of safety net to keep the wild dangers outside. Figure 85 illustrates the barrier between humans and nature in the urban fabric of cities.

In the past, a zoo would be one of the interpretations of nature within the confines of urban structures. This space that would facilitate the experience that human was seeking. This interpretation was to take untamed nature and enclose it within boundaries to a site, becoming an attraction for city residents and tourists. Over the course of time, this interpretation has proven to be old fashioned and controversial, creating tension with certain beliefs and customs. Recent protests (see page section 4.3.1, page 65) have highlighted the issue of animal captivity in South Africa, and people have become more sensitive to practices surrounding animal care and well being.

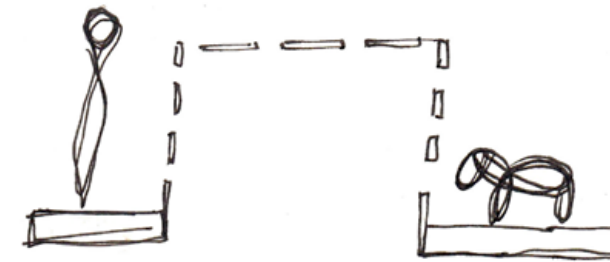


Figure 85 Reality of urban/nature
(Author, 2019)

4.3.4 Concept global

Conceptual approach

Arnold Berleant's theory on globality in ecosystems will be used as a tool to dissect the site's meaning, with reference to Arnold Berleant's explanation of the concept global; Global directs us to an ecosystem on a scale that circumscribes all living and non-living things on the globe. Berleant also questions if we can apply what we know about our planet on a universal scale with reference to the cosmos, and he specifies that the entire globe would react as a single living organism within the larger scale of the universe (cosmo's), in the way that we react to our larger context as a single organism. This idea can be imagined as an ever-expanding array (Figure 86). In this instance, as a singularity within the array would act as an ecosystem for the world as an organism. The cosmos however, can not be defined as a living thing or as an ecosystem as there is no way to know that the knowledge of ecologies can be applied on a (global) cosmic scale (Berleant, 2010: 3).

The possibilities of the site can however, be seen through a view of the past. It can be seen as the interpretation of what man aims to encapsulate from nature to an urban setting. This was done through a Zoo, a place where people could gather and experience something that is far from their daily life enclosed inside a cage, or park. Untamed nature could be found taken as still image, and placed inside comfortable confines, surrounded by a programme that allowed for entertainment, leisure and social interaction, Figure 87 illustrates mankind outside of the cage, and natures within. The Bloemfontein Zoo, accompanied by the Kings Park Rose Garden, was a large social hub that attracted not only the city residents but also tourists and passers-by. This formed part of the larger precinct we find today, that is the Loch Logan Mall, the park, the Zoo and the sports precinct. This can be related back to the concept global and that each organism forms part of a greater array, with the park being the smaller scale, and the precinct the next step in the array which moves on to the city, and the country, etc.



Figure 86 Array (Author, 2019)



Figure 87 Traditional Zoo (Author, 2019)

4.3 Theoretical site consideration

4.3.4 Concept global

Justification of Aesthetic

According to Berleant (2010:11), aesthetics can be explained as an individual or group or a set of principles concerned with nature and beauty and appreciation thereof. It is an artistic taste and is a branch of philosophy which deals with questioning these principles. Aesthetics is highly subjective and relies on the perspective of individuals. This makes it hard for us as humans to establish the specific parameters of aesthetics. Grouping particular preferences together to form a general idea of aesthetics are bound to exclude and create conflict with certain individuals/groups, and even though aesthetics can be a problematic term, it is linked to global ecosystems.

The significance of a global ecosystem is not a matter of biological interest only; one can also find aesthetic properties present (Berleant, 2010:12). An ecosystem becomes an all-inclusive scale of proportion, harmony, and unity in variety. A range of styles and enhanced perceptual pleasures also emerge from an enlarged repertoire of styles, traditions and media. Berleant also mentions that aesthetics from a global ecosystem could serve as pragmatic criteria for a degree of its aesthetics features. They characterise much of the art and the appreciative experience and have a considerable impact on architectural practice.

Layers on site:

The existing layers on site can be used as a definitive guideline for uncovering the history and its counterparts and using this to arrange the new interpretation from old to new. From movement on site to existing buildings and cages. The most prominent feature present on the chosen site is the sunken rock cages on the southern side of the site, the prominent features of the raised rock/stone walls create a trace, a lasting footprint that can be engaged with (Figure 88).

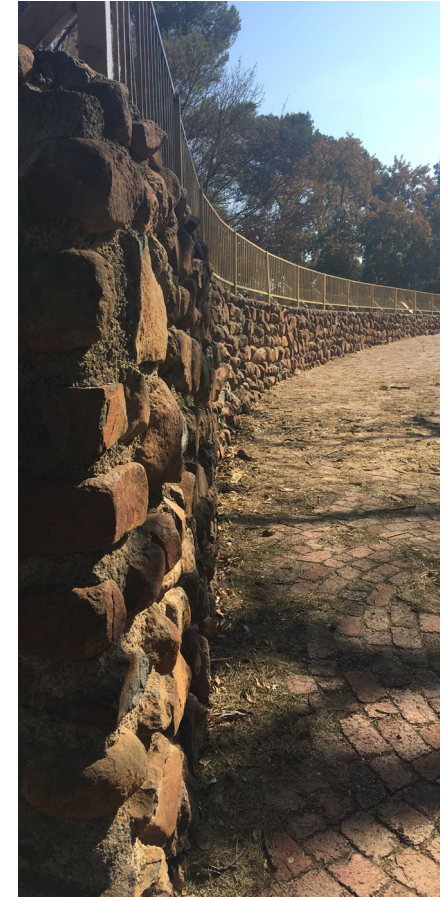


Figure 88 Rock walls of enclosures (Author, 2019)

4.3.4 Concept global

Application to site

Suppose we as residents of Manguang are the ecosystem that would mean Bloemfontein is the organism. Bloemfontein resembles the global and the rest of South Africa and the cosmos. This can be seen as one interaction of the array mentioned earlier. Bloemfontein has its ecosystem and complexities within its mechanism that make it tick. The organism (Bloemfontein) would have a visible effect on its global counterpart. In the same way, King's park and the zoo are also organisms within the ecosystem of Bloemfontein. Organisms that could be given new life if a suitable new organism is grafted to it.

Berleant uses climate change as his catalyst for the growth in global awareness; therefore we can identify Bloemfontein's catalyst. The social and cultural climate is in a hotbed of change in our city's CBD, an independent irregularity that is shaped by the residents. These changes can be connected to the individual needs and ambitions of the different being is within the city's boundaries. The CBD would have an interesting and distinctive aesthetic to the rest of the Bloemfontein's model. The globalized innards of the city originates from a very rich and diverse heritage (Berleant, 2010: 11).

One could interpret this layer, or footprint on-site, to be the fossil of the previous organism that made up part of the ecology of its time (Figure 89). This organism has since failed and died however, it shows the basic framework of an aesthetic that can be extrapolated into new and contemporary facilitation of the organism that it used to be, aiding as a resource to guide the new programme of the intended design proposal. This fossil can be seen as a host plant, and the design proposal as a new shoot or twig being grafted to the existing framework (roots) illustrated in Figure 90.

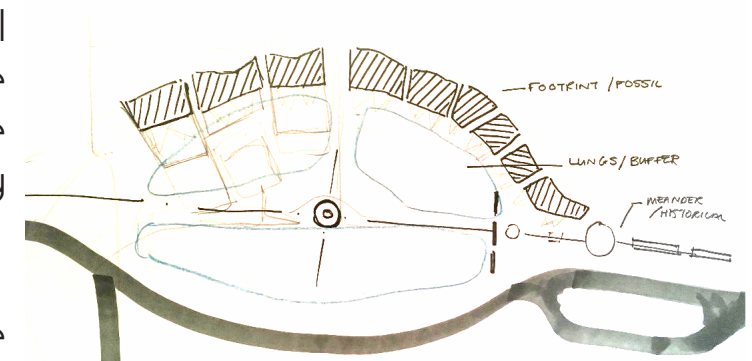


Figure 89 Fossil of the site (Author, 2019)



Figure 90 Fossil graft concept (Author, 2019)

Precedent studies on Concept Global

Precedent study:	Zootopia
Primary function:	Integration of nature and urban
Location:	Givskud, Denmark
Architect(s):	Bjarke Ingels Group
Year:	proposal project/ in progress

The project idea provides an intriguing opportunity for the creation of a space with "the best possible and freest possible environment for the animals' lives and relationships with each other and visitors."

The architects set out to design a man-made ecosystem that ensures that cities and buildings suit the way of life, as well as offer a generous framework for all people to live in harmony. They also hope to enhance the quality of life for the animals, keepers and the guests as well as providing the discovery of ideas and opportunities that will transfer back to the urban jungle.

The creation of the park has been characterized by the integration of nature and natural elements into cutting-edge, innovative architecture. Attempt to "integrate and hide buildings" within the landscape.

This precedent is applicable to the concept global as a result thereof, leading to zootopia. The project aims to integrate nature with the urban, and nowhere is this challenge more acrimonious than in a zoo (Archdaily, 2014: online).

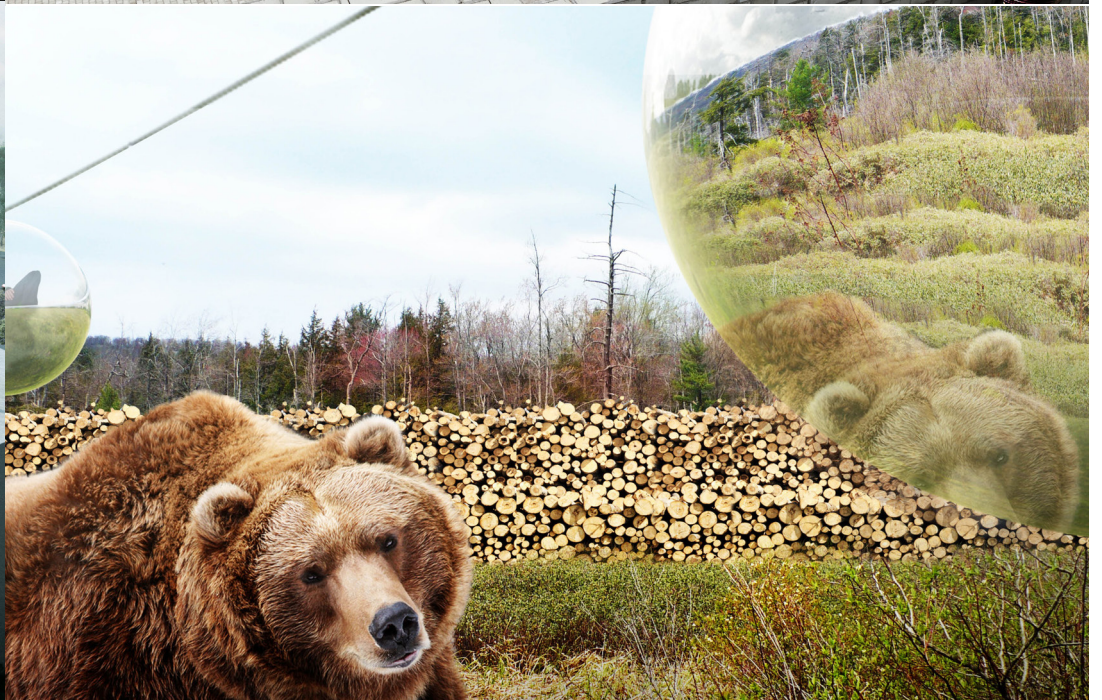


Figure 9| Zootopia BIG architects (Archdaily, 2014: online)

4.3 Theoretical site consideration

4.3.4 Concept global

Result in Zootopia

Result in Zootopia

The main goal would be to integrate all the diverse ecosystems within Bloemfontein's organism. The people that roam and explore the streets of the inner city create the internal mechanism of the CBD, each network relating to the next. Unveiling these ecosystems would reveal a colorful system in the centre of South Africa. When considering an intervention within Bloemfontein, one should honour the needs of the organism and singular ecosystems to maintain the dynamic and spontaneous nature of the personality of the place. Changes should be deliberate, planned and goal-oriented. (Berleant, 2010: p13), as when a plant is grafted, there is a clear intention from the botanist.

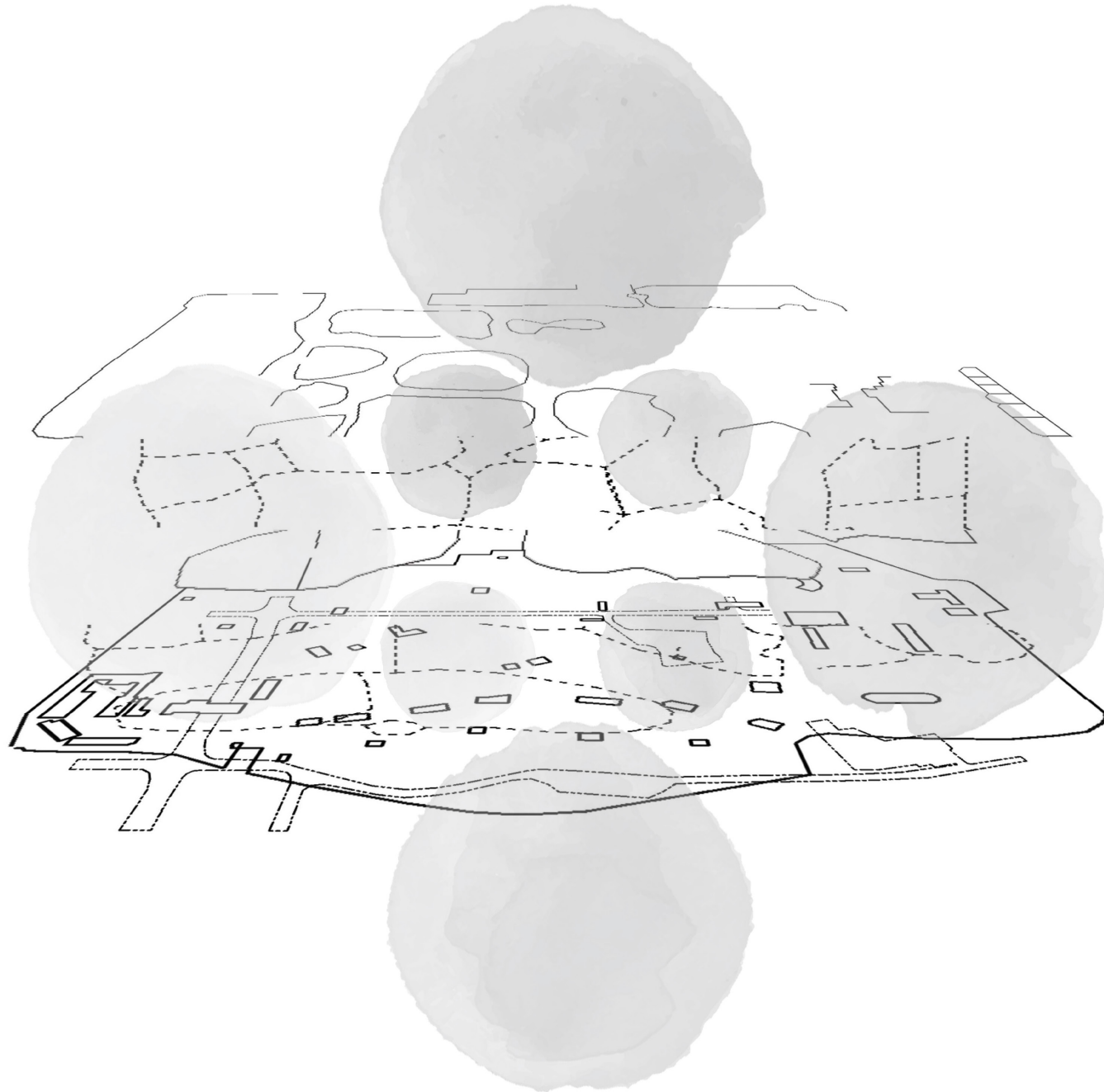
The result would be that of a "zootopia", a place that imagines community or society (Urban) that possesses highly desirable or nearly perfect qualities for its citizens (Nature), a perfect place that has been designed, so there are no problems. This ideal is a very ambitious goal, but a version of this could be realized. If social justice aspects are seen as the first measures of success, access may lead to successful engagement, and this, in turn, could lead to zootopia. Figure 92 illustrates the success of the hypotheses with man in nature, hand in hand, with the barrier becoming non-existent.



Figure 92 Zootopia (Author, 2019)

PART 3:

DESIGN AND TECHNICAL SYNTHESIS



PART 3: DESIGN INFLUENCES

Chapter 5: Technical resolution

This investigation aims to describe, illustrate and demonstrate key technical elements in the formulation of the design project. The generation of the construction synthesis draws attention to important technical details that are cardinal to the design and uniqueness of the project

Content:

1. Environment
2. Location
3. Microclimate
4. Existing Structure
5. User behaviour, socio-economic profiles
6. Topographic analysis
7. Sustainability
8. Form and function
9. Massing and Facilities
10. Circulation
11. Garden precedents
12. Site detailing
13. Structural system

5.1 Environment

This urban space is a critical issue that is at a loss within the CBD of Bloemfontein, the proposed ensemble of buildings is located within the natural landscape of the park that is situated and enclosed by the fabric of the city. The park has the potential to reach its roots out from within, to the city. The proposed intervention will aim to accommodate public engagement with the site. The approach of delivering this natural space back to the city represents the re-activation of the park and the regrowth of the space and place.

Kings Park can be defined as an urban space, where people could gather in a collective. The park suffers at the extent of choking on its own fumes. The natural environment is currently lacking in healthy gathering spaces for participation, public/private accessibility, rightful justice to the site in means of vegetation and care as well as overcoming unfairness through resource and power. Figure 93 and Figure 94 illustrates the site and the forces and their exercises that it needs.

"Urban space, is essentially a place of discovery, a 'milieu of possibilities'. In urban space, man 'dwells' in the sense of experiencing the richness of a world. We may call this mode collective dwelling, using the word 'collective' in the original sense of gathering or assembly. When choices are made within the milieu of possibilities, patterns of the agreement are established, which represent a more structured kind of togetherness than mere meeting" (Norberg-Shultz, 1985: 12).

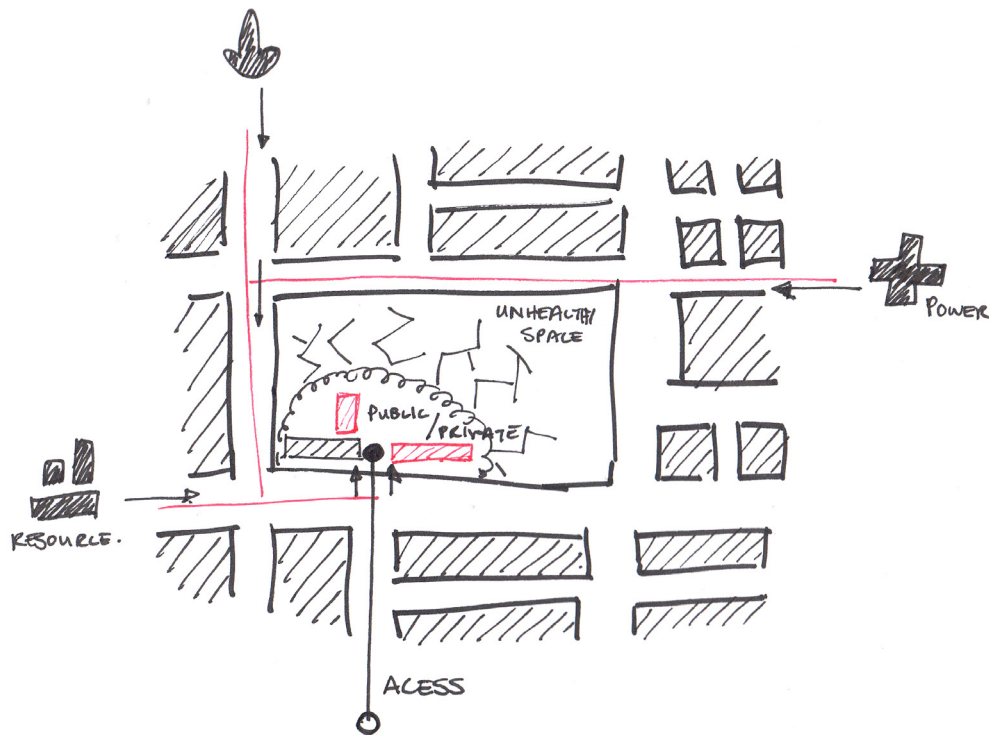


Figure 93 (Author, 2019)

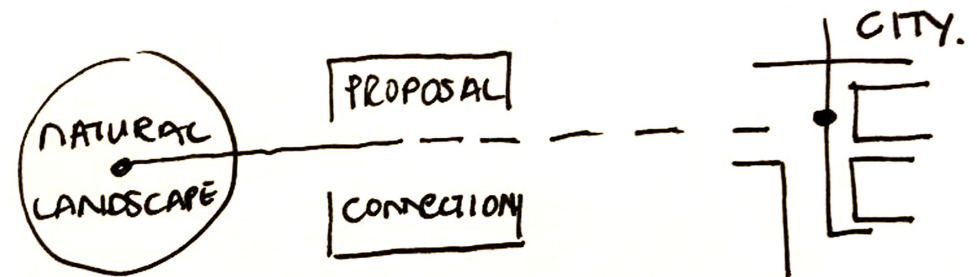


Figure 94 (Author, 2019)

5.2 Location

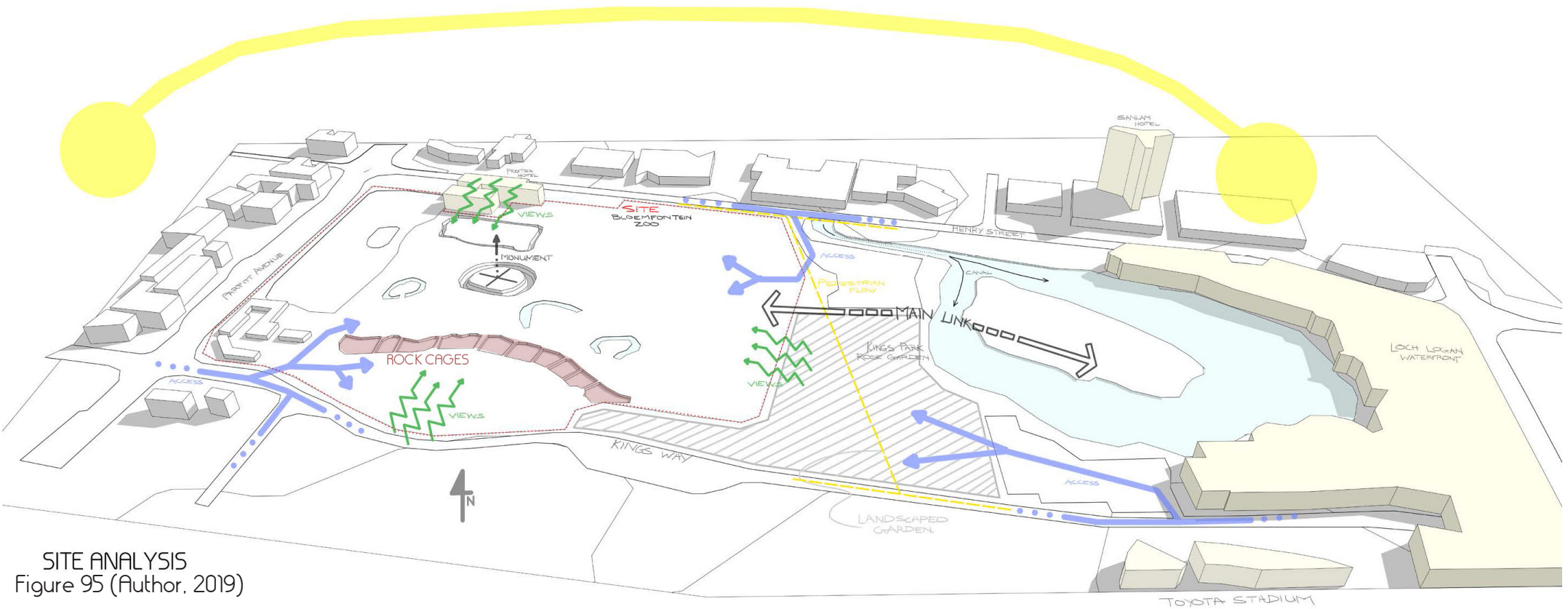
Refer to Figure 95:

The site is located on the southern boundary of King's Park, next to King's Way. The immediate context of the site is Loch Logan Waterfront to the east, residential and commercial zones to the west, CBD to the north and the recreational sports precinct to the south. The site consists of the Bloemfontein Zoo and the King's Park Rose Garden.

There exist public access on the south-western corner of the site; this leads to the Bloemfontein Zoo's service yard. The access is controlled by a security guard and gate. The access point on the north-eastern side of King's Park provides access and parking to visitors of the Bloemfontein Zoo. New access and parkade system are to be introduced on the site (southern boundary) to create circulation to this dead area on the site. The site is orientated to the north east, the sun path on-site is illustrated in the figure; this will influence the design proposal in regards to orientation.

Identified monuments on-site include the Bengal tiger pit, marked as 'monument' in the figure, and the rock cages. The rock cages form part of the main site location and will guide the main part of the design proposal.

Public access on-site, illustrated in yellow, exists through the Rose Garden. This walkway is bordered off by the fence surrounding the Rose Garden and prohibits public access.



SITE ANALYSIS
Figure 95 (Author, 2019)

5.3 Micro climate

Topography

The topography of the site is not strongly defined by any natural slopes, hills or trenches. The area is mainly uniform and flat save for a slight slope from the south to the north with a fall of 1 meter. The strongest element is the waterfront lake, although too far from the site to have any significant influence on the design course.

Orientation

The proposed area of the site exists between four micro-climates within the city centre, to the north there is industrial, to the east it is commercial space, the south denotes park and recreation with the city sports precinct and to the west, it is residential zones (Figure 95). The area which contains the site is a rectangular shape and is quite large, measuring about 600m x 300m, the chosen part measures approximately 250m x 100m. The proposed buildings on site are orientated north or north-east in order to elevate northern exposure and lower the western (Figure 97).

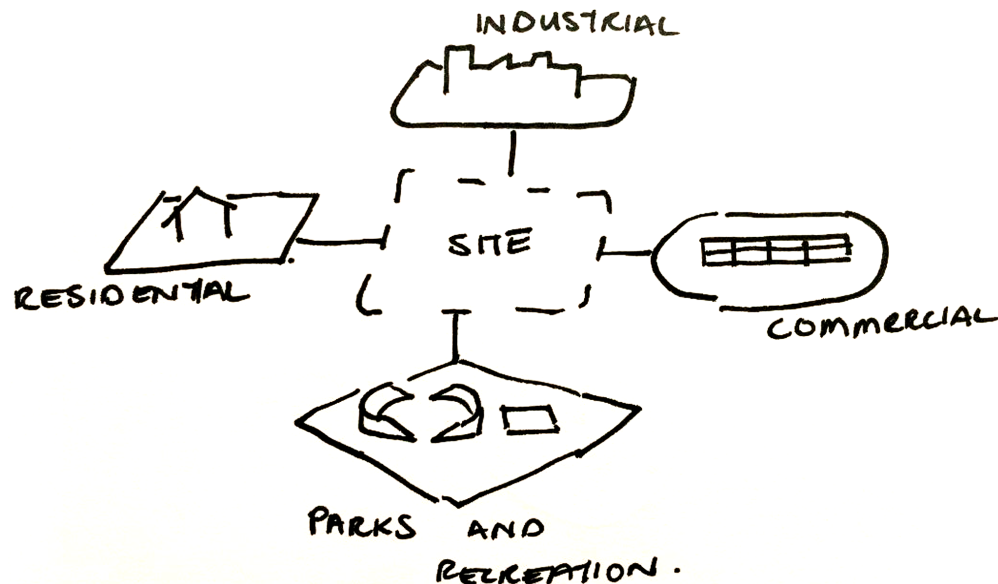


Figure 96 (Author, 2019)

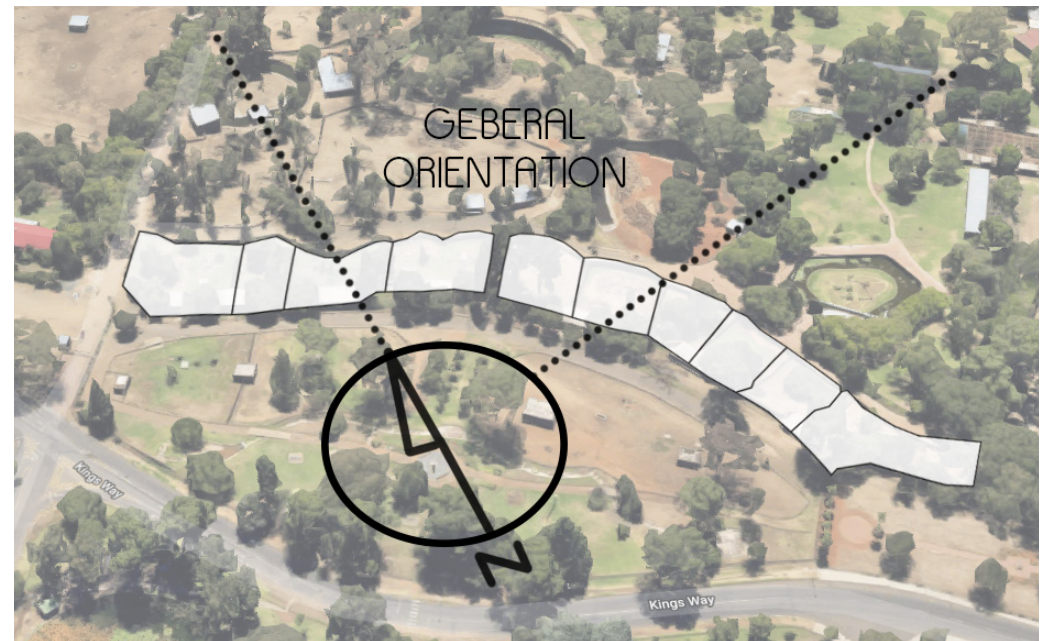


Figure 97 (Author, 2019)

Soil

By the Beaufort group, Bloemfontein is located on the Adelaide Subgroup. The Beaufort group locates itself within the Karoo supergroup, consisting of Blue-grey and purple mudstone intertwined with yellow sandstone and siltstone. Bloemfontein being under the Karoo supergroup mostly consist of mud- and sandstone, Karoo post-dolerite intrusions are also a common occurrence (Botes, 2015: 28-35).

Climate

Bloemfontein rain per year is mostly accounted for by mid-summer rainfalls of about 370mm p/year. It's lowest rainfall of 1mm in the mid-year and it's highest at the start of the year with about 65mm. Average temperatures range from 17degrees mid-year to 30degrees in the start of the year. Mid-year this region is at its coldest, when the temperature drops to 0degrees (Jacobs, et al., 2013).

5.4 Existing Structures

The site currently functions under two domains, the Kings Park Rose Garden as well as the Bloemfontein Zoo. The chosen area is inclusive of both these domains.

Bloemfontein Zoo:

The Zoo has an array of existing structures, these can be grouped into three occurrences namely; Institutional buildings such as the service facilities, public buildings and exhibition spaces; Man-made 'natural' elements such as the Bengal Tiger Pit, formed hills, water trenches and larger habitational spaces; Steel structured cages containing a wide variety of animals.

Figure 98 Features on site (Author, 2019)



Kings Park Rose Garden

The garden also has a variety of elements found on site, these can be grouped into three main groups as well, namely; Landscaped gardens, although these are all in a state of decay, the remnants can still be seen and identified; Walkways and paths, this element denotes the movement on the site as there are laid outlines and axis (Figure 99); Pergolas, fountains and statues. This element creates the feeling of the area, with rests and water features creating an experience of the garden as a whole (Figure 100)

These elements serve as clues to the landscaping of the design. The design proposal will aim to repeat these elements in a contemporary and appropriate manner.



Figure 99 Walkway (Author, 2019)



Figure 100 Pergola (Author, 2019)

Specialised services for functioning:

Micro-brewery & distillery workshops, Drying and Curing of plant matter workshops

Waste disposal and collection

Ventilation and temperature control

Cold and Dry storage

Cleaning of plant systems

Basic facilities for Garden Ensemble upkeep:

Storage space for garden upkeep utilities.

Waste storage and collection/disposal

Support spaces for staff and visitors: ablutions, kitchenettes, auditoriums, cafeteria, auditorium, restaurant, exhibition space, consultation room and multifunctional workshop spaces.

Accommodation List

Building one

Marketplace

- market stalls
- information kiosk
- cafe
- seating
- restaurant
- kitchen
- deliveries

Exhibition

- Temporary exhibition space
- Permanent exhibition space
- Storage facilities
- Staff quarters: kitchenette, storage, bathroom

Restaurant

- Deliveries
- Kitchen: preparation, cooking, serving
- Storage

Access building

- Fire stairs
- Elevators
- Public ablution

Office

- 4x offices
- staff ablution
- Lounge and kitchenette
- Storage

Building two

Entrance

- Lobby
- Information desk
- Seating
- Retail store: storage, shopfloor

Commercial

- 2x Cafe: storage, shopfloor
- Staff quarters: kitchenette, storage
- Public Ablution

Workshop

- Microbrewery and distillery
- Plant processing
- Storage: cold, dry, chilling, raw
- Public Ablution
- Information desk
- Exhibition space
- General workshop space

Buiding three

Auditorium

- Seating capacity of 50
- Storage x2

Staff quarters

- Kitchenette
- Reception
- Storage
- Office

Healing Center

- Lobby
- 3x Consultation rooms
- Yoga studio: staff quarters, kitchenette, lobby
- Public ablutions

Landscaping

Garden shack

- Staff quaters
- Storage
- Waste removal
- Public ablutions

The primary user profile of the proposed project is the general public, implying everyday residents of Bloemfontein and tourists. The design aims to become an integrated part of the existing central sports and recreation precinct of Kings Park. The landscaping will create spaces for the pedestrian and public to observe and interact with nature as well as experiencing the benefits associated with green spaces (Figure 101 and Figure 102). The existing park and zoo found in Kings Park are spaces in need of preservation and regeneration (re-interpretation and re-activation). The project goal is to encourage the interaction of individuals and groups to relate to their natural environment through urban green space. These spaces play an integral role in socio-ecological aspects to the health and well-being of humans (Jennings et al, 2017: 73), and will be introduced in the design of the social justice hub.

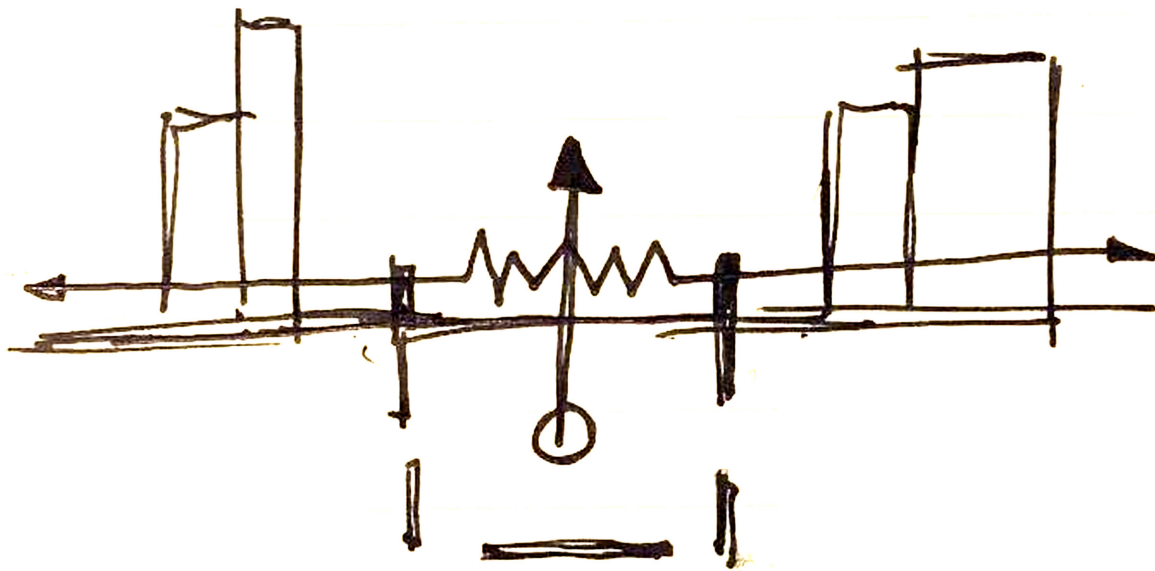


Figure 101 (Author, 2019)

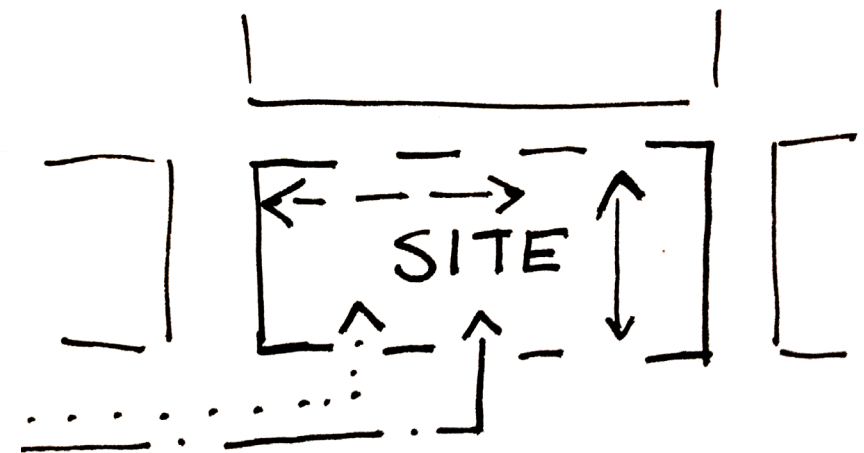
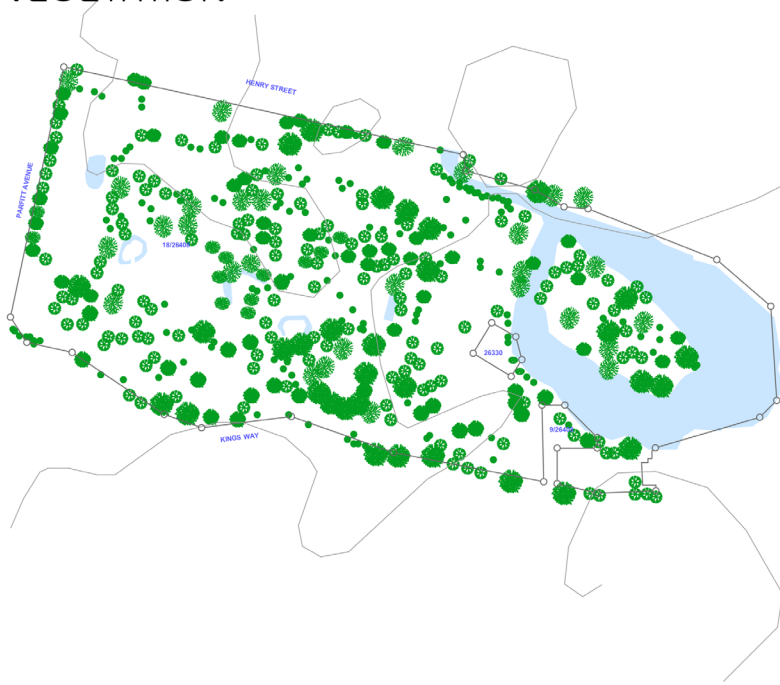


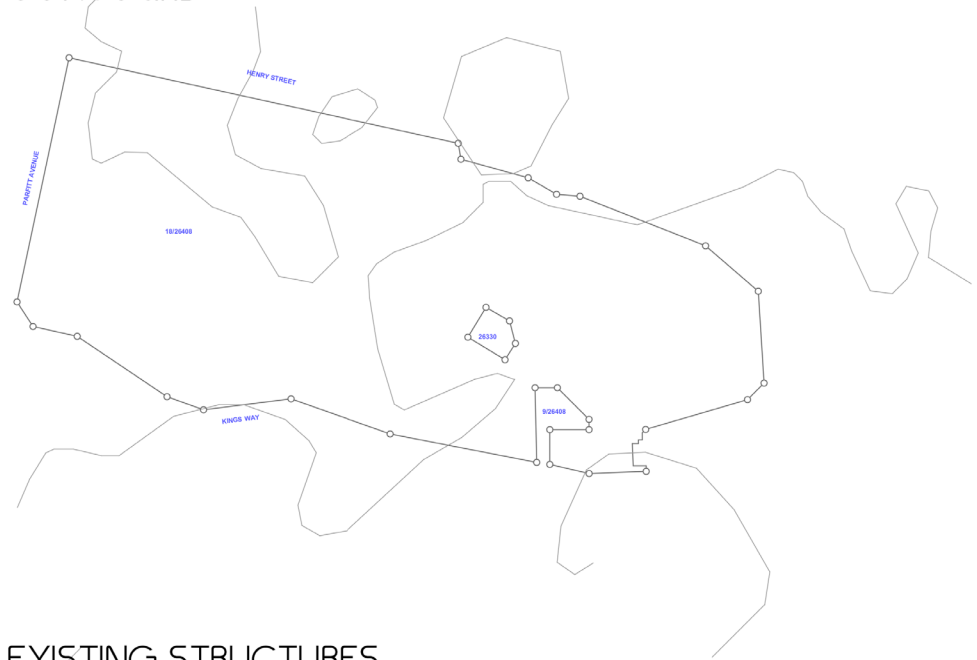
Figure 102 (Author, 2019)

5.6 Topographic analysis

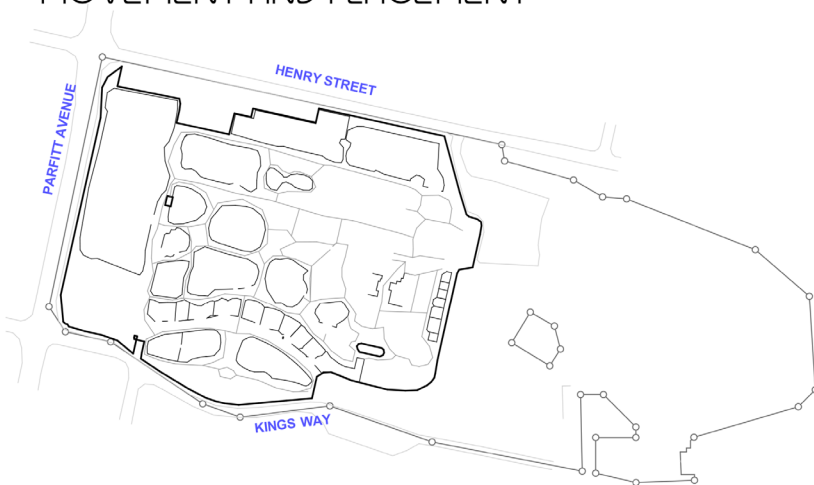
VEGETATION



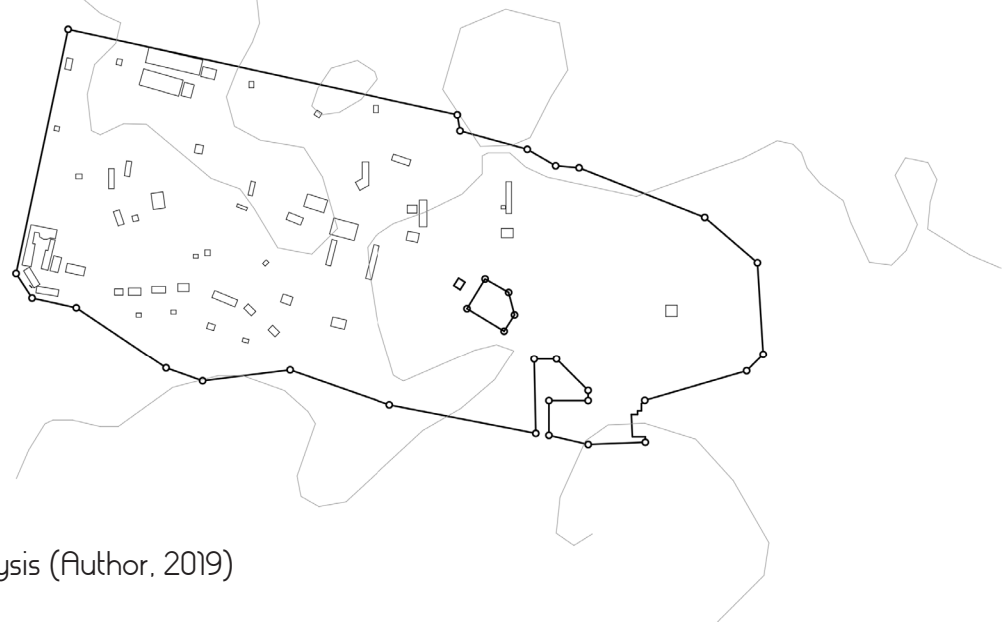
CONTOURS



MOVEMENT AND PLACEMENT



EXISTING STRUCTURES



Vegetation:

The site is home to a large number of trees and shrubs, forming a large part of the experience on-site.

Contours:

The site has a slight slope of 2 meters, falling to the south-western side.

Movement and placement:

There is a radial layout of paths and walkways accompanied by fountains and pergolas in the Rose Garden, while the layout in the Bloemfontein Zoo is more organic and follows the placement of the enclosures and buildings.

Existing Structures:

The Bloemfontein Zoo has a large number of institutional buildings servicing the staff as well as exhibition buildings for smaller animals. The service yard on the south-western border is to be demolished. The Rose Garden has no structures on site.

5.7 Sustainability

The sustainability approach of this project originates from the philosophy of design that a building grows from the earth, into a structure that engages actively with nature and natural ecosystems in order to enhance the physical and mental well-being of the users of the building, this creates a basis for sustainability practices within the site of Kings Park.

The design aims to incorporate multiple forms of passive and active sustainable systems with the goal of creating the framework for a regenerative design that echoes the ethics of mindfulness in design. The inclusion of passive design strategies may improve climatic condition on the site significantly as well as increasing the efficiency of the structure as a whole while making sure that the buildings comply with requirements of SANS 10-400-XA: 2011. The design aims to fulfill the principles of environmental, economic and social sustainability

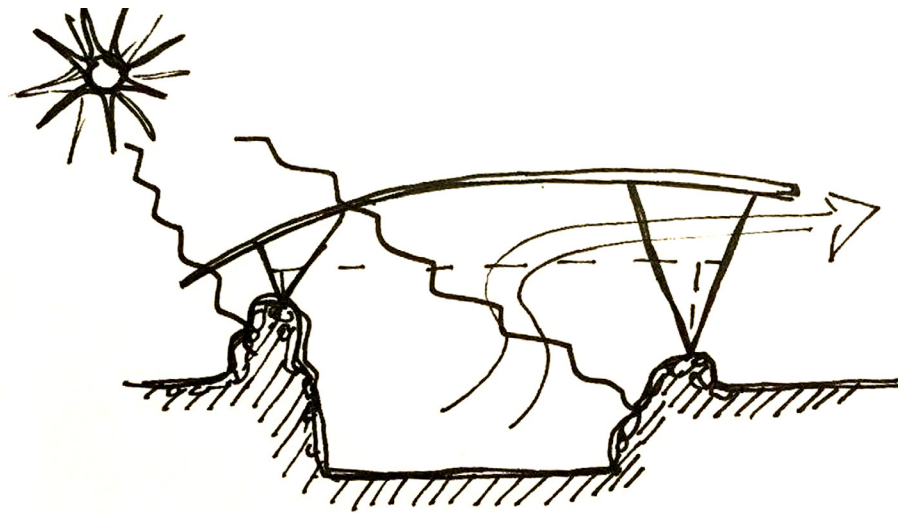


Figure 104 (Author, 2019)

Type of Sustainability systems

Shading

Passive design strategies and systems include solar heating, orientation, shading, natural lighting and ventilation intending to lower the use of energy. The reduction of energy usage in conjunction with higher usage levels of natural renewable energy sources allows for a more sustainable and environmentally friendly design. The ensemble of buildings will also include some other sustainable system designs to minimize the footprint of the design project further and improving the environmental sustainability of the project.

Solar Panels

The harvesting and harnessing of the heat and light generated from the sun is called solar energy. There are forms of solar technology that can store and make this energy available to humans as an energy source. This source of energy is renewable and can be used in buildings to heat and light buildings through passive solar design and electrical generation (Jones, 2009: 1). Systems that generate electricity through solar energy use a photovoltaic system to achieve this (SAPVIA, 2017). These systems apply to the location of the site, as Bloemfontein has an annual average of 3300 hours of sunlight exposure (World Weather and Climate Information, 2016). Including these photovoltaic solar panels in the design proposal is a sure way of reducing the use of non-renewable energy sources. The proposed panels for this project are polycrystalline cells, these panels are slightly less efficient, but make up for this in cost efficiency, form factor weight and flexibility (Sendy, 2017). These panels, more specifically the 'EnerSol' 250 Watt Polycrystalline solar cells will be mounted on the north-facing curved roofs of the projects.

Rainwater Harvesting

Rainwater harvesting refers to the harvest, collecting, store and redistribution of rainwater. The proposal will aim to incorporate two main ideas to harvest rainwater.

The first type of harvesting will be roof catching systems, the roofs of the buildings will lead all collect roof rainwater to a system of tanks, these tanks will be situated next to the buildings, as well as on the lower ground. These tanks, 10 000 litre JoJo tanks will also be a way of level differences within the site.

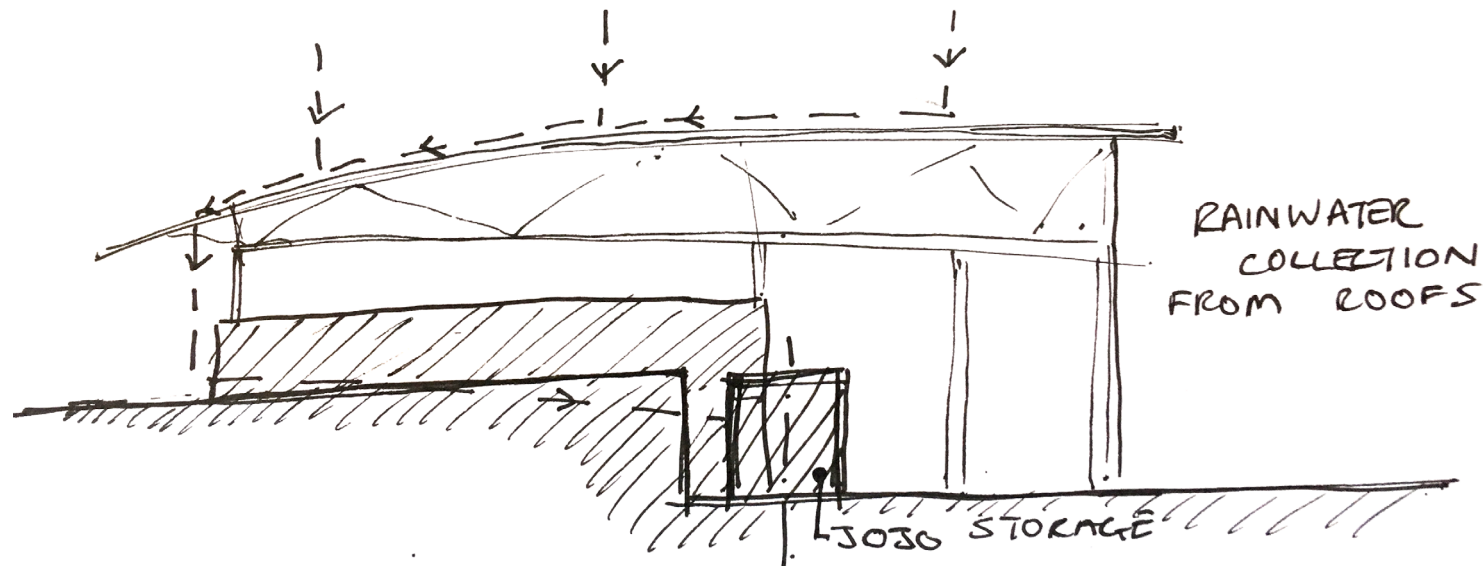


Figure 105 (Author, 2019)

Second type of harvesting will come from ground collection systems, this system will collect water by water run-off throughout the site. This will be achieved with the use of pervious pavers, channels will run underneath the pavers to tanks sorted below the ground, along the central spine of the site.

Pervious bricklayers for paving used for walkways and courtyard spaces will allow for maximum water efficiency. This system or pervious paving is made up of; 32mm base made of stone, a geofabric cover that lies underneath the bedding stone and finally, there exists a 2–5mm sand bedding above to filtrate the water and to keep everything in place. Crushed stone is used a way of holding the pavers in place, aggregate of about 1–2mm, this helps to create a healthy bond as well as filtration at the same time. Corobrik Cederberg Piazza Pavers will be used for exterior paving of pervious paved areas (Figure 106).

The planters for the landscaped gardens will also be interconnected with the pervious brick systems, they will allow for the harvesting of rainwater, further helping the site maintain and drain itself efficiently and sustainably (Figure 107).

The rainwater collected on the site will be used for irrigation throughout the project's landscaping to help with the upkeep of the garden.

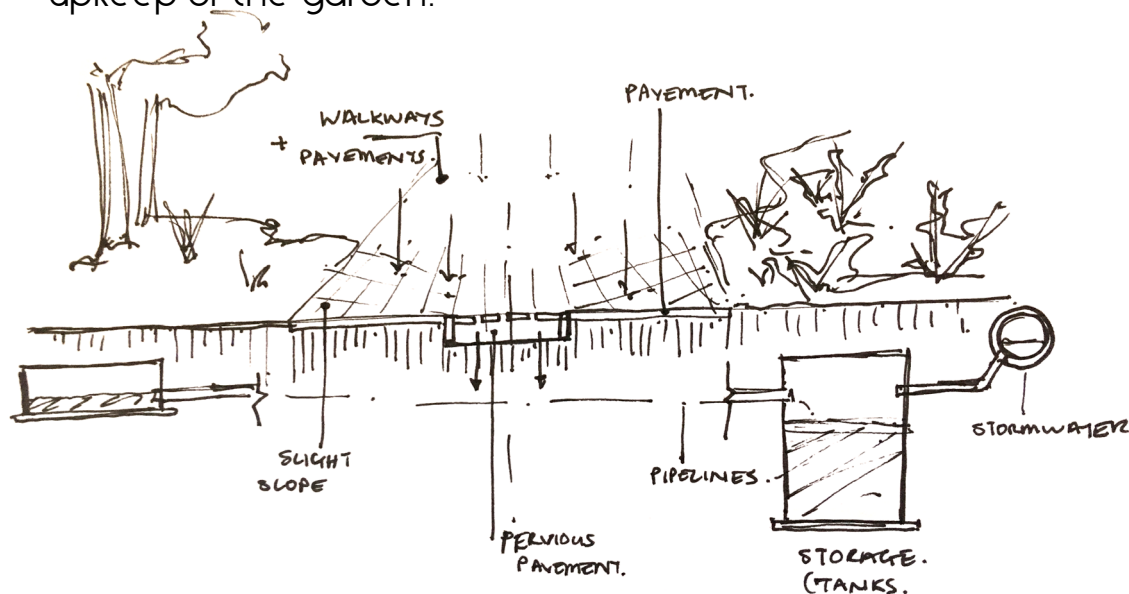


Figure 106 Pervious walkways (Author, 2019)

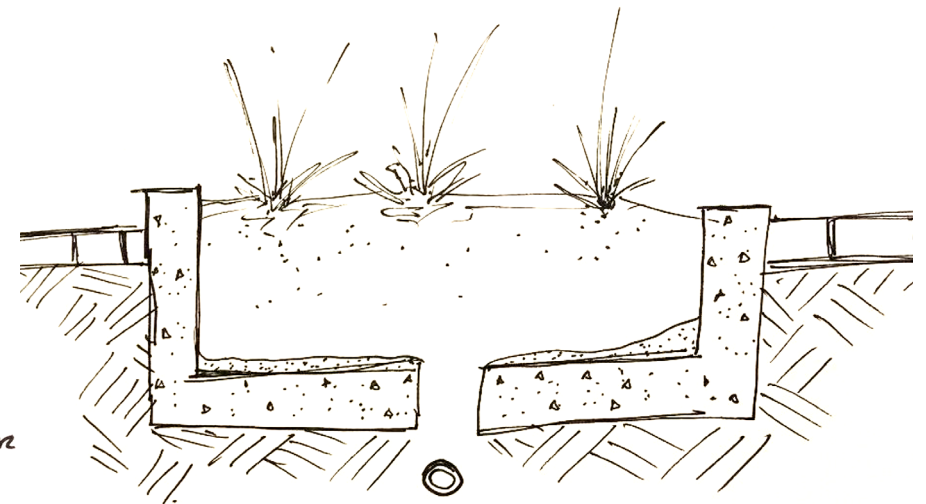


Figure 107 Pervious planters (Author, 2019)

5.8 Form and function

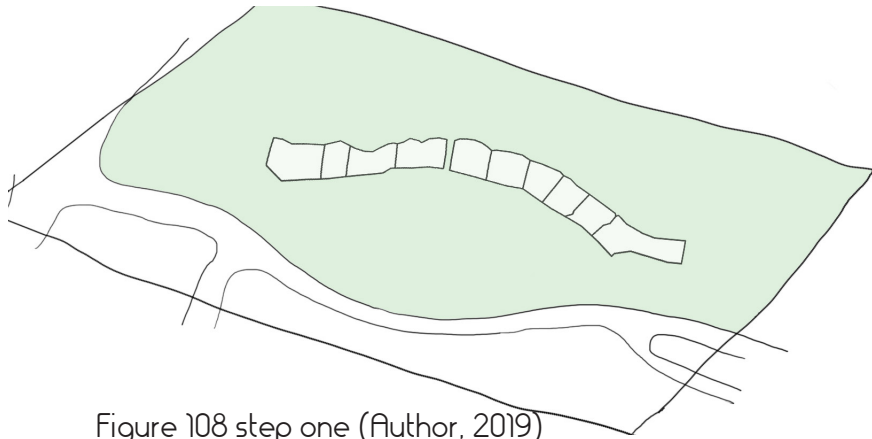


Figure 108 step one (Author, 2019)

Step one

The form of the site derives from the mentioned rock cages, these cages will be excavated and enlarged following the process of the design appropriately.

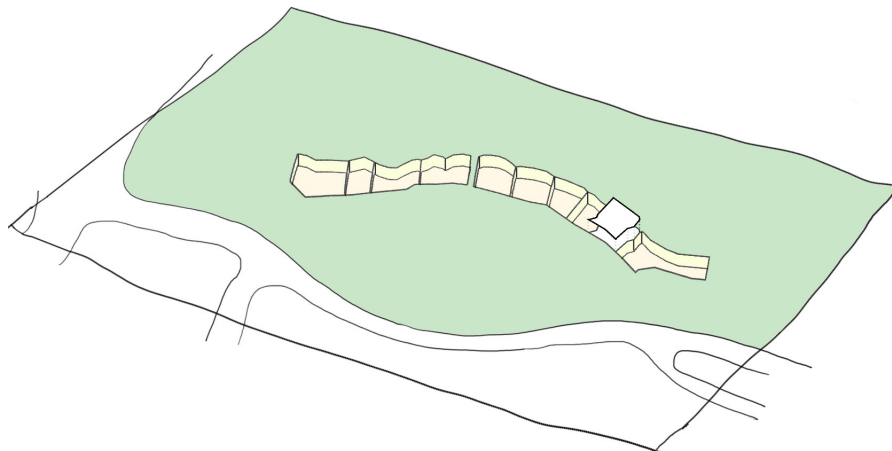


Figure 109 step two (Author, 2019)

Step two

The enclosures are individually identified, and appropriate functions are to be placed accordingly.

The enclosures are excavated to a depth of 3m, the second cage to the east is filled with earth and raised to ground level.

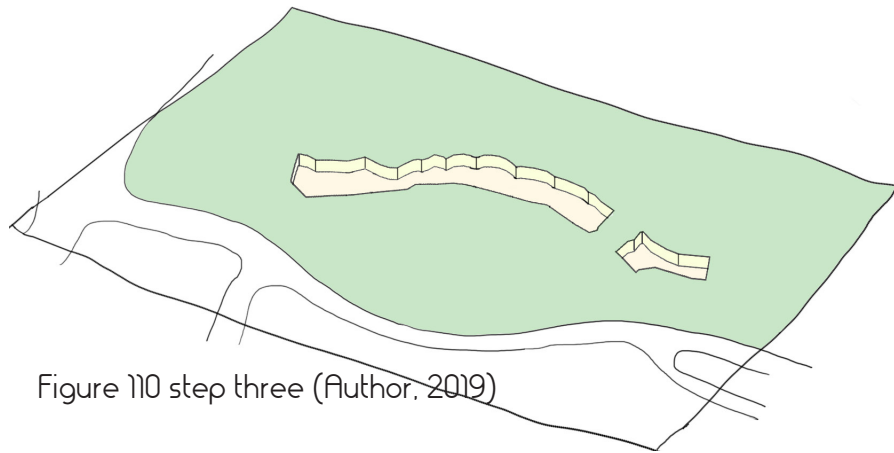


Figure 110 step three (Author, 2019)

Step three

The excavated enclosures are 'unified' as on 'pit'. The raised enclosure on the western side creates a division in the newly created form to allow for separation of public and semi-public space.

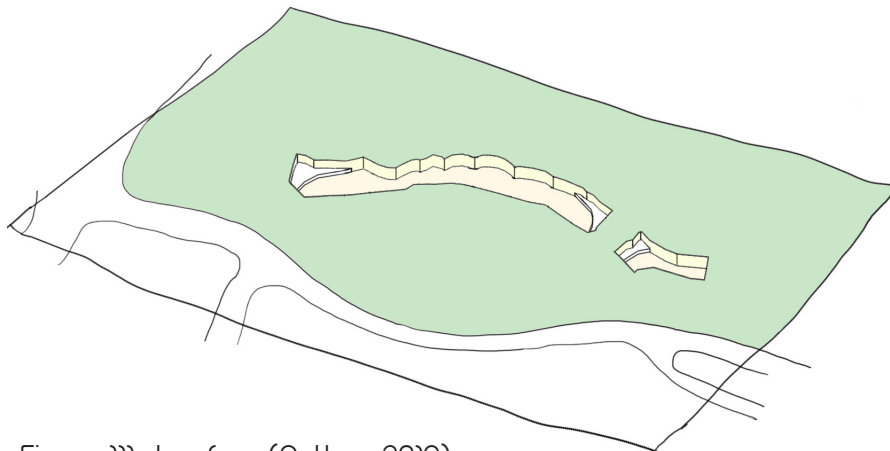


Figure 111 step four (Author, 2019)

Step four

Terraced steps are added to the newly excavated 'pits', with the aim to soften the level change that now exists on site. These terraces allow for a visually appealing experience.

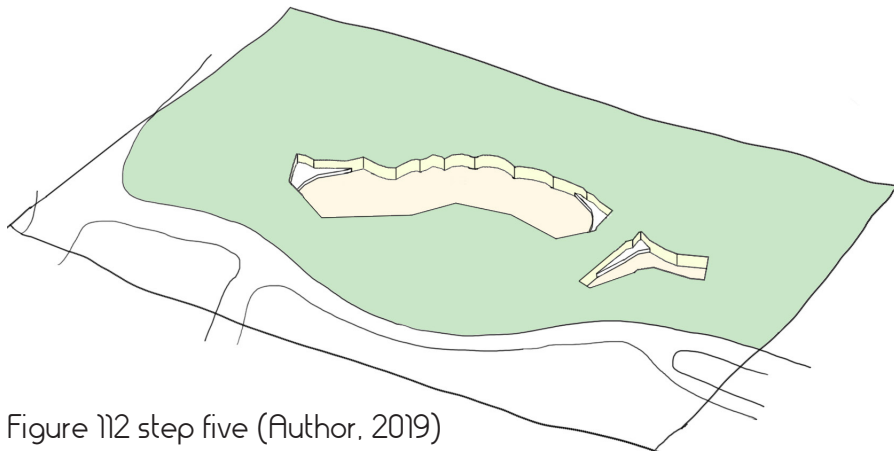


Figure 112 step five (Author, 2019)

Step five

The newly excavated form is extended to the southern side of the site, this creates a larger footprint for the function of these 'pits' as gardens.

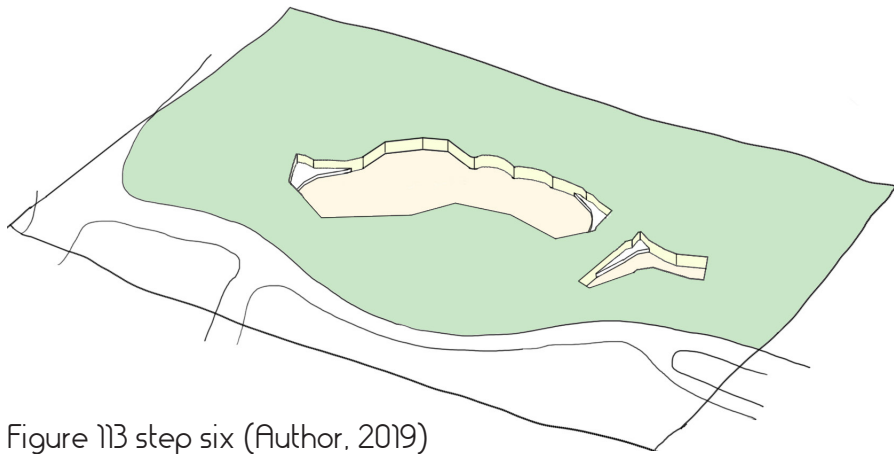


Figure 113 step six (Author, 2019)

Step five

The new form is further extended on the northern side to allow for the placement of a sunken amphitheatre.

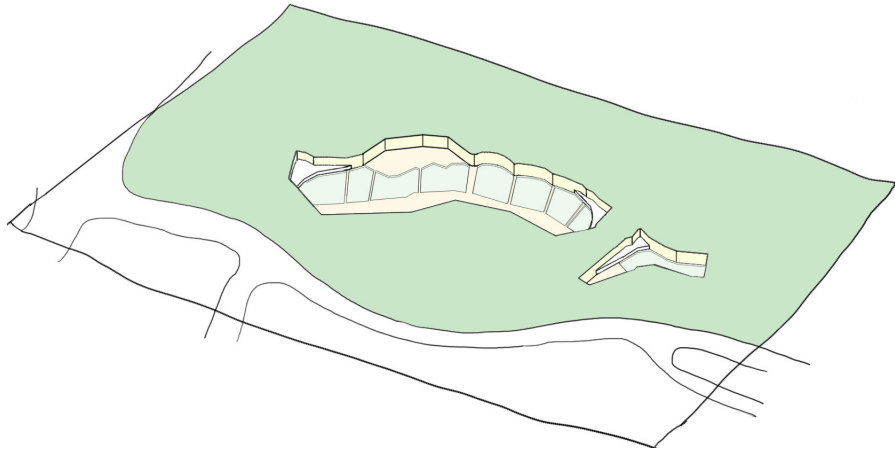


Figure 114 step six (Author, 2019)

Step five

Finally, the original footprint of the enclosures is re-introduced in the now deepened 'pit'. This will guide the landscaping of the design proposal, as each part of the footprint will serve a different function of the garden.

Step six

Setting out the functions of the proposed design:

The identified axis (artery) on site will create the new access and circulation of the design to the site, giving the appropriate provision of life force to the park. The identified enclosures (lungs) will act as parking spaces for the design, breathing the 'life' into the park. These will be public spaces (Figure 115, blue).

The eastern excavated enclosures will be semi-public garden space (Figure 115, yellow). The western excavated enclosure will be semi-private garden space (Figure 115, red). The enclosure that was raised (removed) will create an access point (Figure 115, blue).

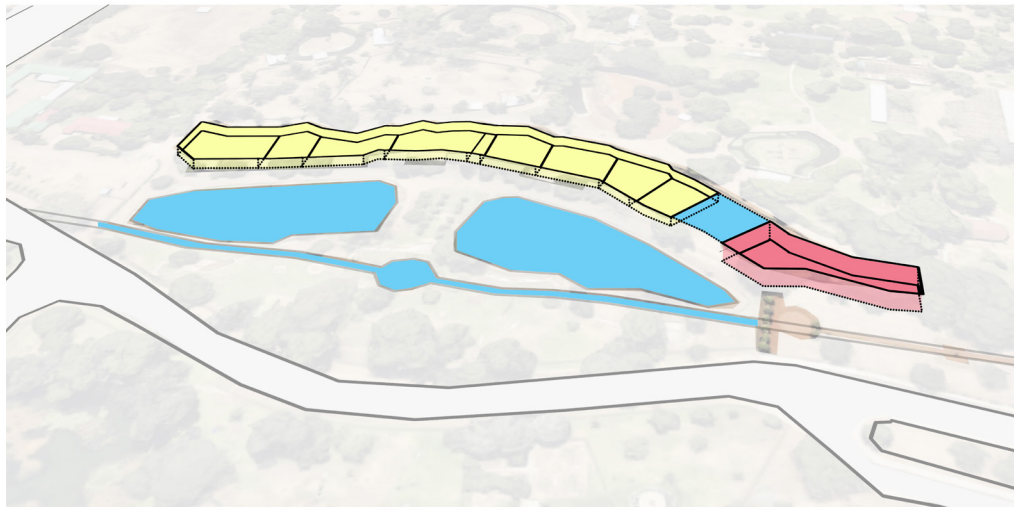


Figure 115 step six (Author, 2019)

5.9 Massing and Facilities



Figure 116 massing (Author, 2019)

In Figure 116:

The buildings, functions and facilities are laid out accordingly:

1. Exhibition/ Office: This structure will function as an exhibition space, as well as administration offices for the staff maintaining the park.
2. Restaurant/Market: This structure will function as a public market place with stalls, it will also include a restaurant and cafe.
3. Entrance/ Retail/ Workshop: This structure will be the main entry point to the design proposal, containing a visitor's lobby and information area. Retail spaces will be set out, selling local produce. The workshop will include a microbrewery, micro-distillery and drying/curing facilities.
4. Traditional Healing Center: This structure will function as a centre for healing, with an auditorium, meditation garden, yoga studio and therapy consultation spaces.

The garden interconnects all of these structures and will function like a system of provision for these structures through selected plants and trees.

5.10 Circulation

Circulation on site will be made available through a system of arteries. These arteries will exist on the different physical levels on-site, as well as throughout the function of the programme. The three main parts of the proposal, as mentioned in 5.9, are the market place (west), the workshop (center) and the healing center (east).

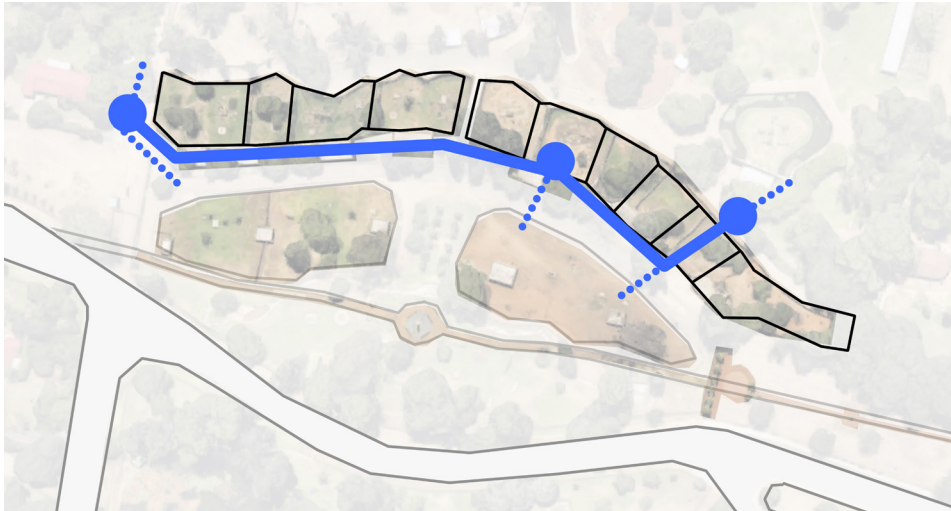


Figure 117 paths access (Author, 2019)

Figure 117

Blue: Access to the three main functions of the proposal from the parkade and circulation areas.

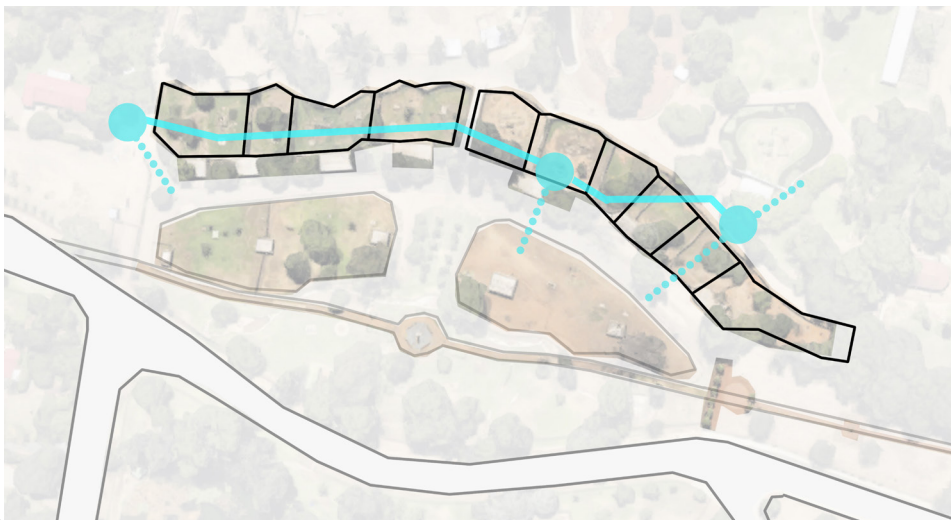


Figure 118 walkway access (Author, 2019)

Figure 118

Light Blue: Access to the three main functions of the proposal from the parkade and circulation areas via the suspended bridge running across the gardens.



Figure 119 Access (Author, 2019)

Figure 119:

Blue: Walkways on the ground level, connecting the three different functions of the design

Light blue: A suspended bridge connecting the three main functions over the garden

Green: Garden walkway, allowing for tours and access



Figure 120 Garden access (Author, 2019)

Figure 120

Green: Access to the lower ground garden and the three main functions respectively through walkways on lower level.

White: A system of walkways interconnected, leading through the individual garden spaces.

5.10 Garden precedents

Precedent study:	Babylonstoren
Primary function:	Garden planning
Location:	Klapmuts, South Africa
Architect(s):	Patrice Taravella
Year:	1974

The architect incorporated classical French traditions into the design of the gardens, the designed the gardens using two axis one from east to west moving along the traditional Cape Dutch house. The other axes spans from north to south, starting at the Babylonstoren Hill to the Babel Restaurant (Babylonstoren, 2018).

There are 300 varieties of plants in the gardens and all of the plants are either edible or have medicinal value. The fruit and vegetables are grown as organically as possible and harvested all year round to serve both restaurants on the site (Babylonstoren, 2018). The purpose of these gardens was also to share the knowledge with the visitors on how to grow food in traditional and organic ways (Watson, 2018).

The light open structures in the Babylonstoren gardens create pause spaces for people to relax and connect with nature, as well as for nature to connect with the people walking through the structures.

The sharing of knowledge, use of edible plants and produce made in the gardens can be applied to the design proposal. The layout and walkways landscaping also provides clues to the design.

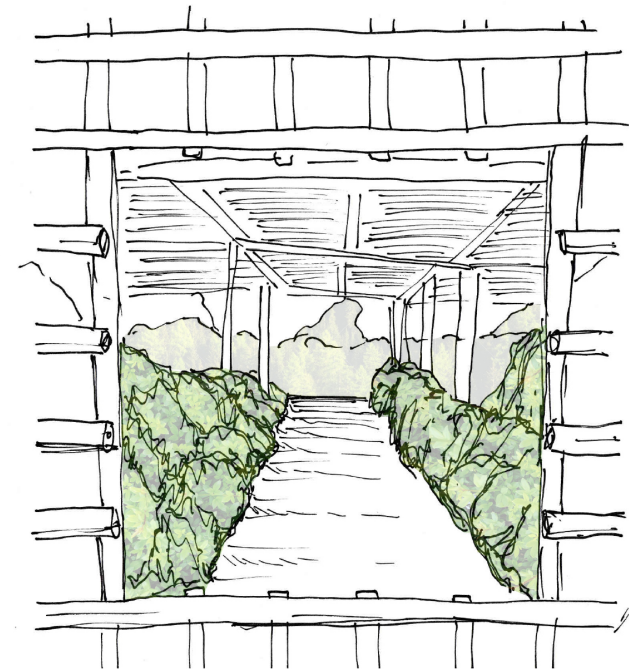


Figure 121 Garden experience, Babylonstoren (Author, 2019)

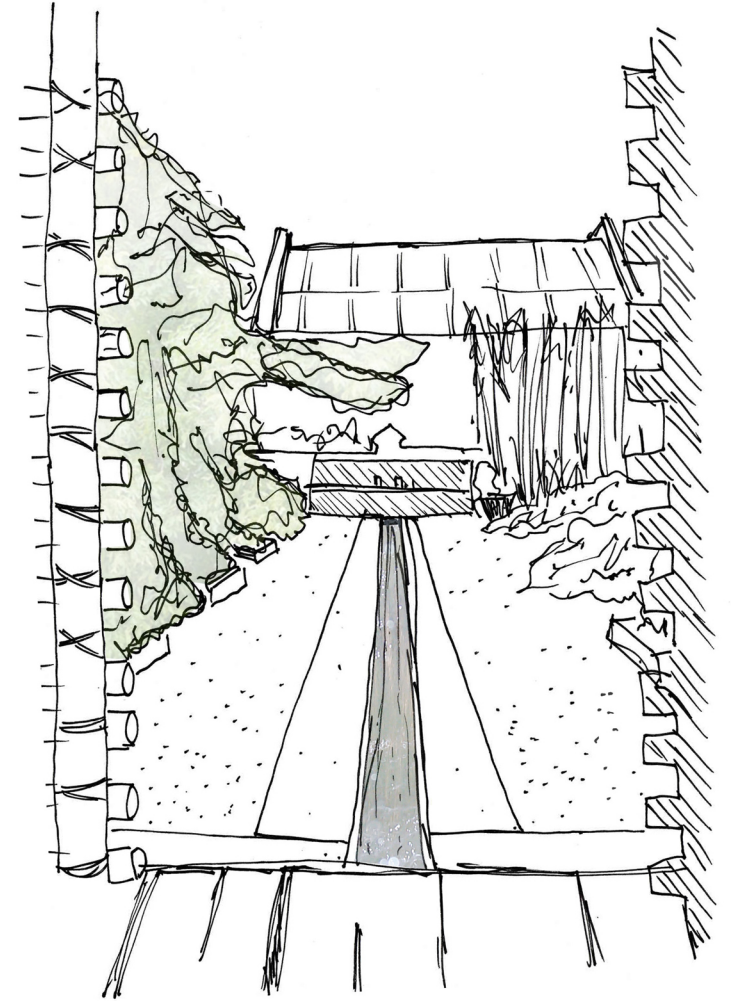
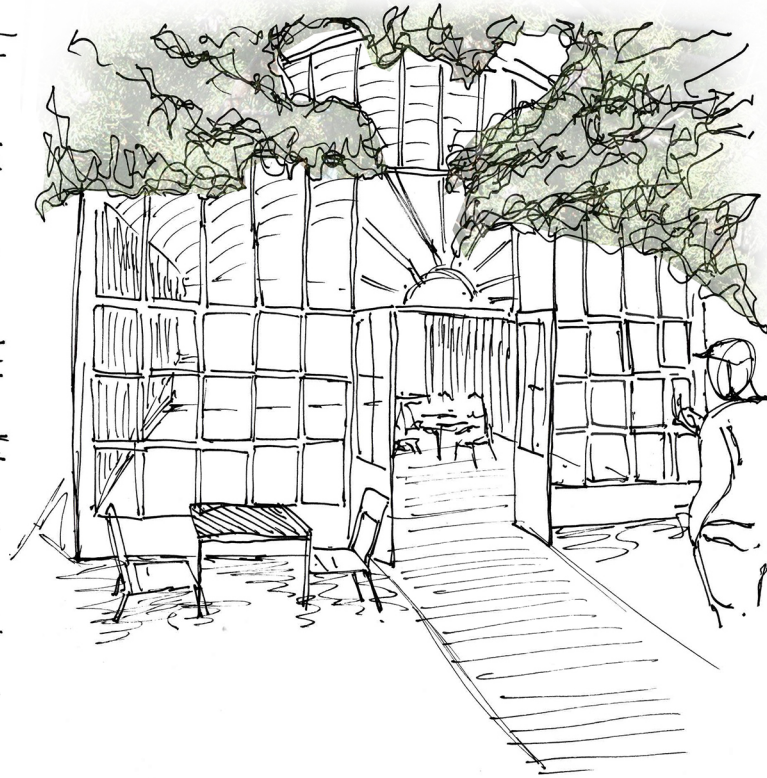
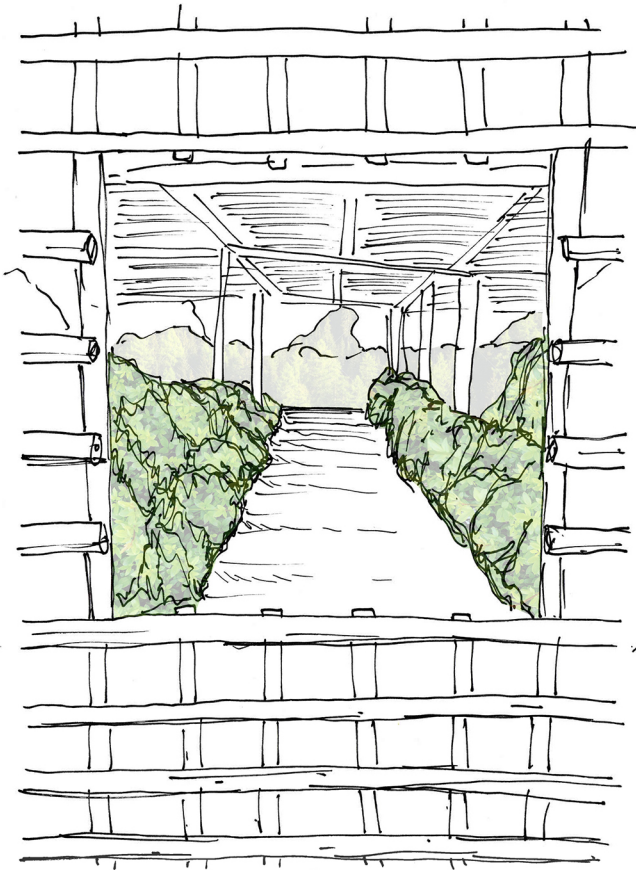


Figure 122 Garden experience, Babylonstoren
(Author, 2019)

SITE PLANNING

Pedestrian access is made available to the public from the southern side of the site through King's Way Avenue, this will create the main pedestrian access to move into and through the site and can be seen illustrated in Figure 123 as the highlighted green area. The main means of access to the site is by vehicular means. New parking spaces are made available to the appropriate parts of the design programme. Figure 123 illustrates this as the highlighted yellow area. Secondary pedestrian routes are interlinked throughout these parkades and connect the main visitor's entrance with the market place and the healing center. It is highlighted by the blue areas in Figure 123. Pedestrian access from the street are public, and available throughout the day and night time, however, parts of the ensemble can be closed off for security reasons without affecting accessibility to nighttime activities that may take place at the amphitheater or market/restaurant area. This is achieved by sectioning the access with security doors that blocks off areas that need to be restricted. The garden aims to be public, but also allow for security without having invasive behavior entering. The park becomes semi-public through the means of restrictive access and appropriate security. The garden area is interlaced with walkways and garden beds. Throughout this landscaping, multiple arteries of access and movement exist, with the main line becoming a garden route that extends from the market place to the entrance (highlighted in Figure 123 by the red color). Finally, the last form of access is an elevated walkway, connecting the three main parts of the buildings, illustrated by the highlighted purple color in Figure 123

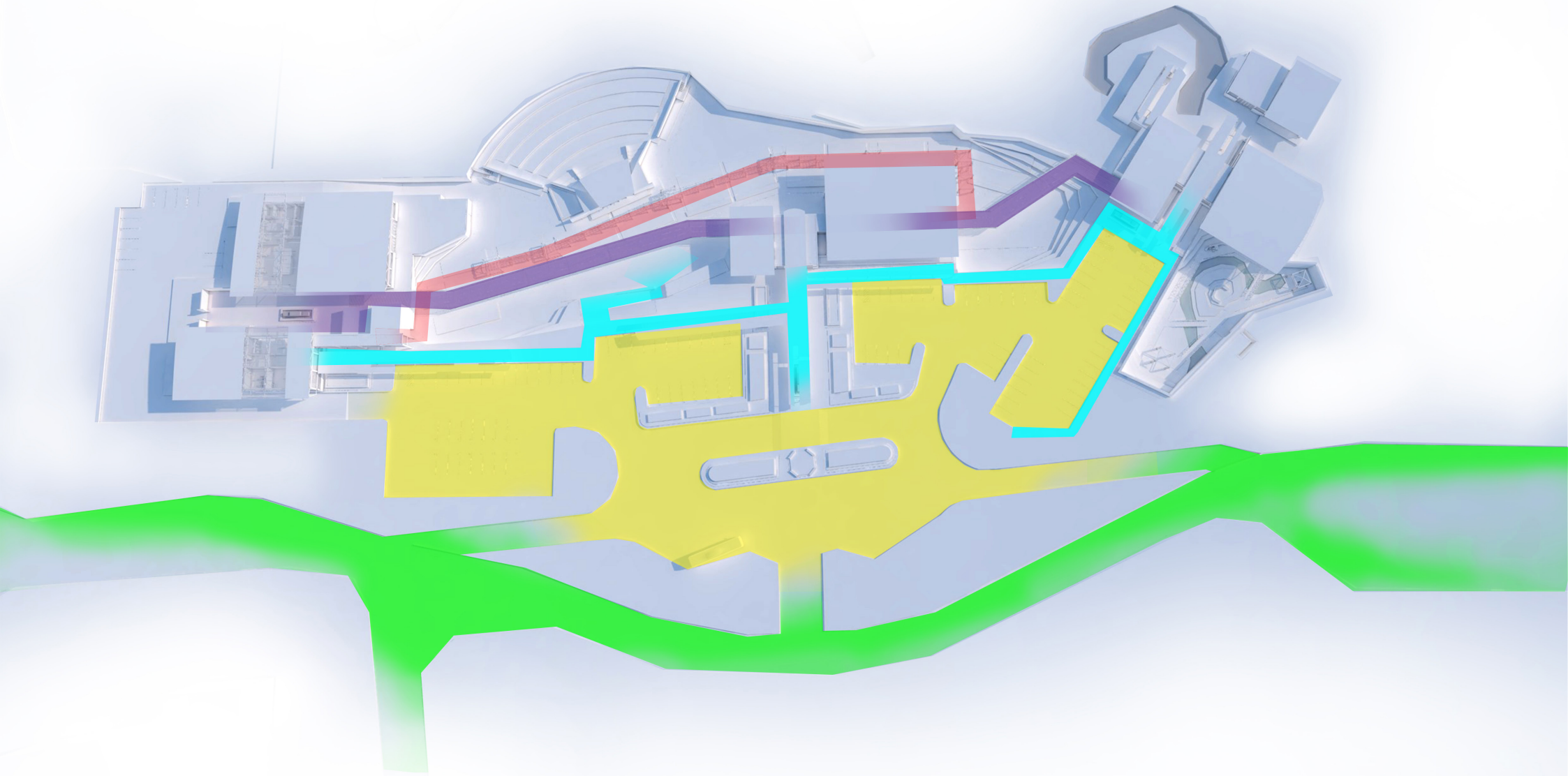


Figure 123 Site planning (Author, 2019)

PROJECT ACCESS

The main entrance to the ensemble is located at the center of the vehicular circulation access, illustrated in Figure 124 by the highlighted green color. Two parkades stem off to the left and right of this facility, each allocating parking for the market (west) and healing center (east) illustrated in Figure 124 by the highlighted yellow color. The entrances for vehicles to the site are derived from the existing axis found on site that facilitated the original Rose Garden's of Kings Park fountain and walkway system highlighted in Figure 124 by the purple line. The main central axis point, that creates the vehicular circulation, encircles the large obelisk statue found on site. The standard size for the parkades are 2500 x 5000mm, with aisle's of at least 7500mm between rows of parallel parking spaces, this ensures for comfortable vehicle access and turning radiuses as well as satisfying the NBR parking requirements (Griesel, et al., 2013: 539) Service, staff parking and access exists on the western side of the market space, this allows services like waste removal and deliveries to access the main arteries of the site without interfering with the public using the ensemble. This route is illustrated in Figure 124 by the highlighted blue area and can be accessed off of the parkade for the market place on the west, allocating ample parking space for the staff of the largest facilitation on site. A large number of parkades are justified through the user group of the site, as most of the people visiting the area would be arriving with their own vehicles. Pedestrians would not form a large part of the visitor's percentage.

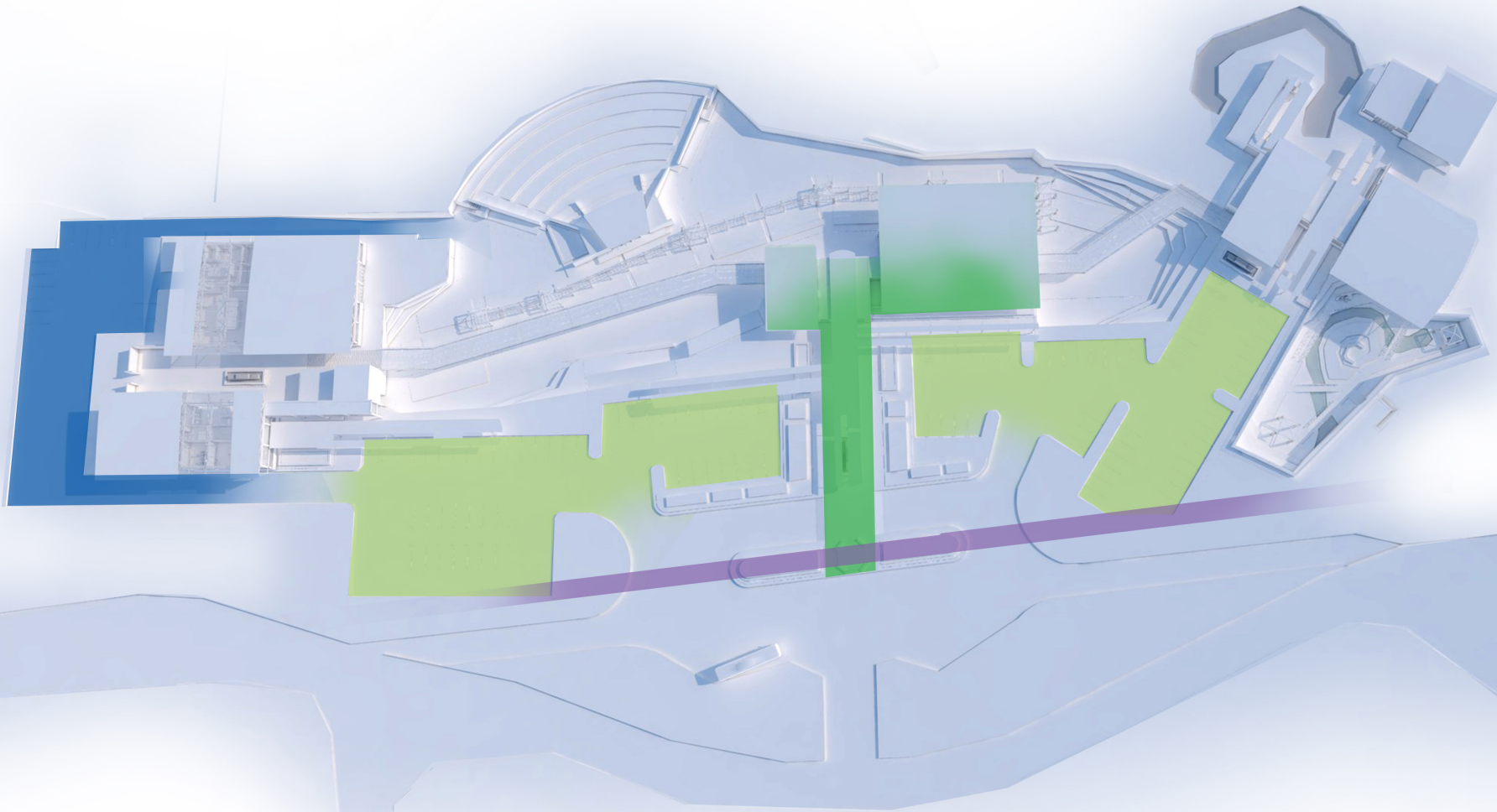


Figure 124 Project access(Author, 2019)

LANDSCAPE DEVELOPMENT

A large part of the design proposal is landscape development, exterior space and walkways that are not necessarily added in the accommodation list considering the fact that they would not always be enclosed by walls. The exterior spaces of the proposal consist of soft and hard landscaping, paved walkways interlaced throughout the design and gardens and a raised walkway. The largest part of exterior spaces is interlinked with paved walkways that are all interconnected, creating connections to and from the main entrance, workshops, gardens and market place. The hard landscaping is formed by the footprint of the existing zoo rock cages. This footprint is excavated to match a level of -3000mm from ground level. The pits formed by this excavation are accented by rock walls and terraced planters, softening the large level differences. The soft landscaping is found clustered around the spaces created by the hard landscaping. These are planter boxes, flower and plant beds, walkways and garden features (highlighted green, Figure 125). The harder landscaping is connected by the raised walkway (highlighted blue, Figure 125), this walkway flows at ground level, over the landscaped gardens that exit at a lower level (highlighted red, Figure 125).

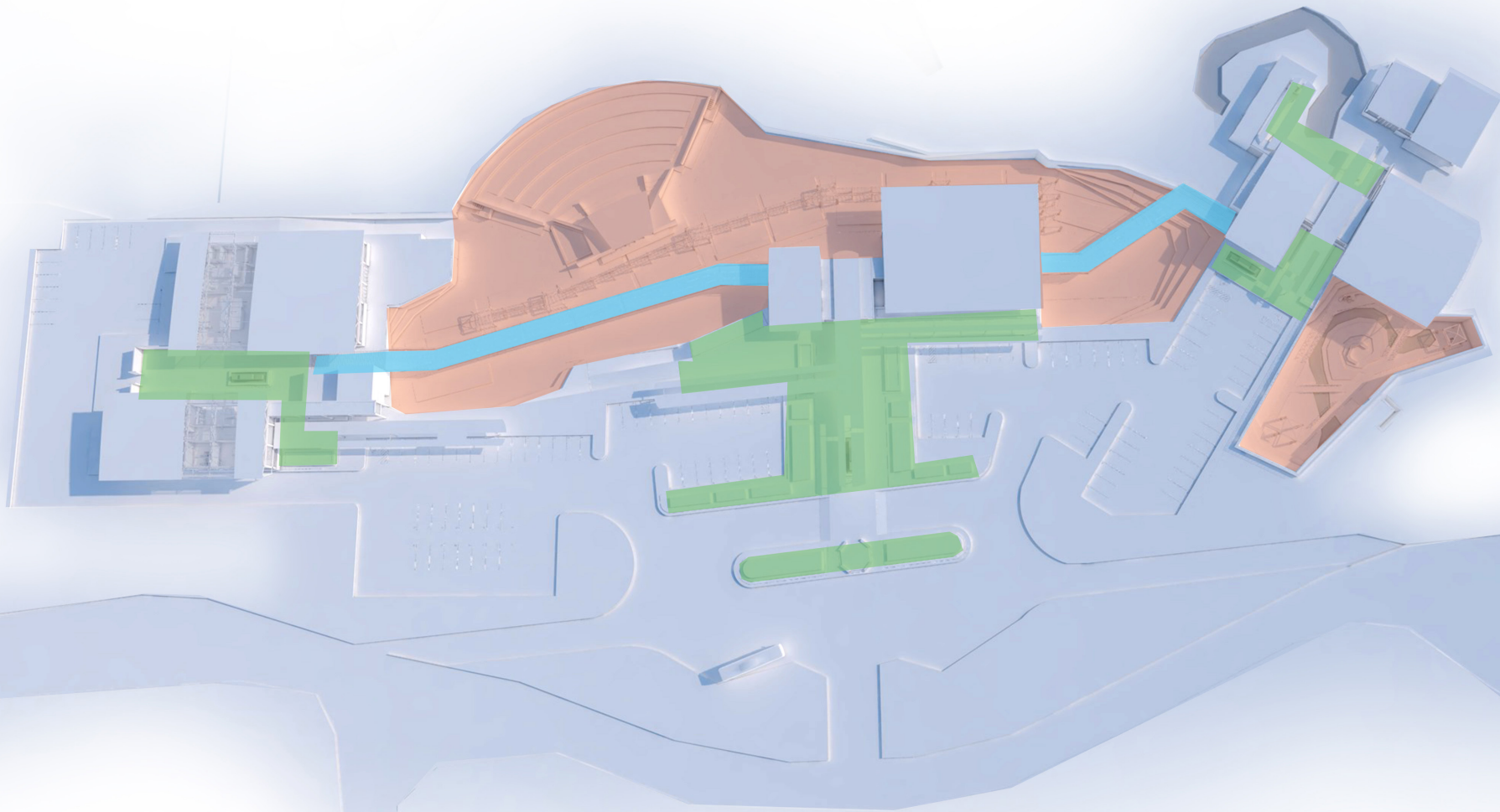


Figure 125 Landscape development(Author, 2019)

FACILITATION OF THE GARDENS

The main garden resides within the excavated footprint on the site. These gardens are specifically laid out to cater and facilitate to the three main functions of the ensemble. Figure 126 illustrates these functions as; Market place and restaurant (highlighted in orange), workshops and craft (highlighted in green) and healing center (highlighted in purple). Figure 126 illustrates the garden areas as the solid fills and the facilitated structure as the dotted lines of each representative color. The garden detailing and specifications are chosen to fulfill the needs of each of these facilities specifically. The zone selected for the market place will contain plants that can be used by the functions of the market, which contains the restaurant and food market, these plants are all either edible or usable in the preparation of food and drinks. The zone for the workshops and craft will be plants that can be processed in various ways; drying and curing, distilling and brewing and extraction. The aim of this zone is to create products such as essential oils, pot potpourri and spirits/beer. The zone catering to the healing center will contain indigenous plants that possess healing qualities, treating things like depression, heart weakness, stress and anxiety. The final 'zone' (or rather, zones) is not dedicated to a specific area, but rather facilitates to the entrances, celebrating the arrival of visitors. Figure 126 highlights these spaces in the color blue, in the same way as the other space. These areas will contain fragrant and beautiful indigenous plants and trees, creating an inviting experience when approaching the ensemble. Re-activating the decaying areas of the site (Kings Park) through the use of public gardens will facilitate to the visitors of the site in a variety of ways, with the main focus being social justice of the public and ecological justice of the site. Produce from the gardens will be used, sold and processed on-site at a small scale, excess material will go to compost and waste removal services. The implementation of gardens that is also functional, to the site of Kings Park creates the opportunity for the inclusive design of the public. This will also activate the site to its full potential that was lost through the passage of time.

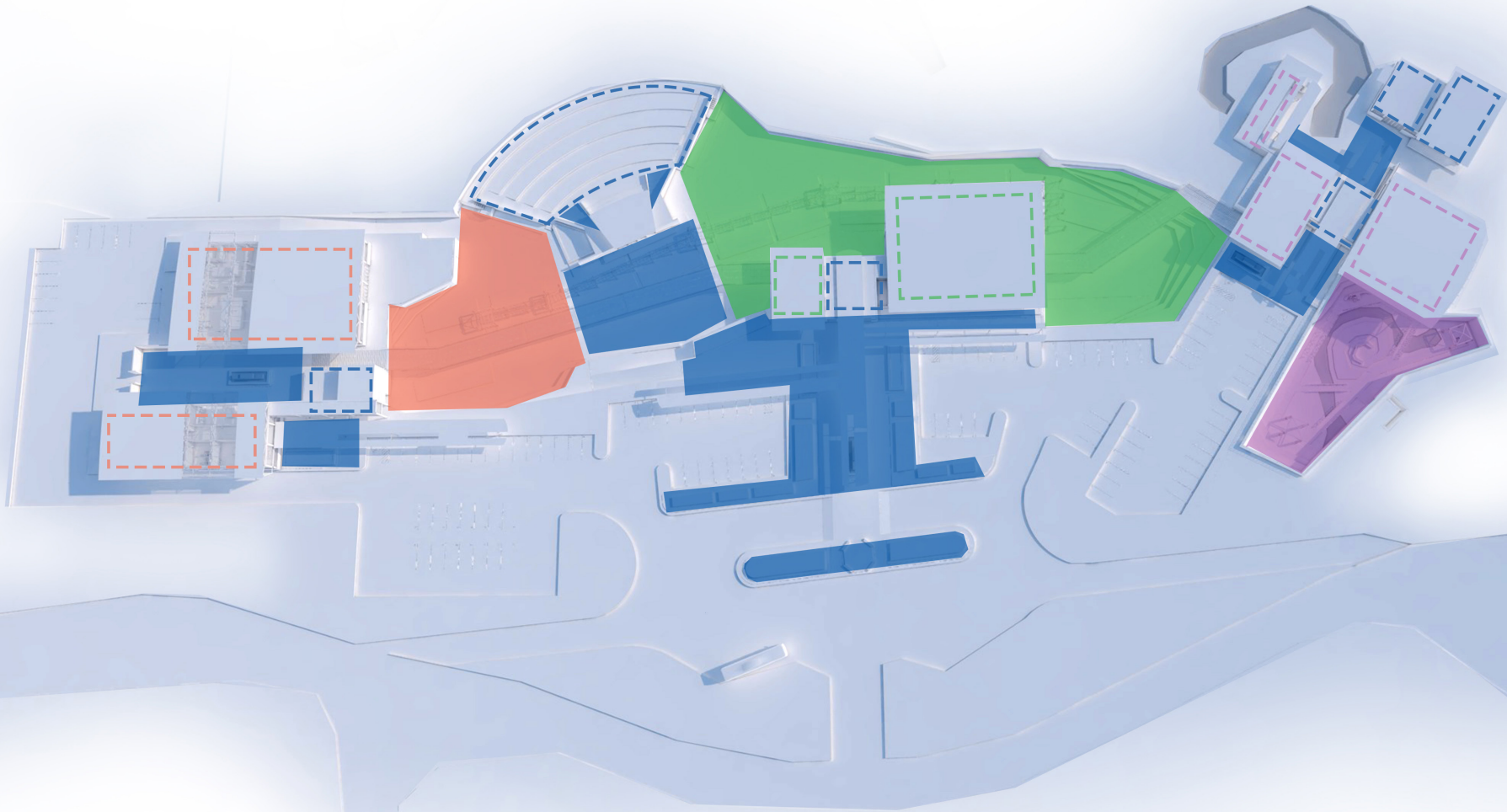


Figure 126 Facilitation of the garden (Author, 2019)

Structural System

Grid

A graphic system was used to define column and beam spacing and positions. This graphic system acts as a structural grid to create a set of perpendicular guidelines to follow in the design process. This system is important in aiding the design process of choosing proportions, structural systems, spaces, materiality, and envelope. The accommodation list must inform this grid for the proposed project being designed, as well as the nature of the soil and foundation the site calls for (Louishidha Kitchley, 2018).

Some influence was drawn from the existing structures on site when deciding the proportions of the grid. The steel animal cages have a ratio of 5:4 and were emulated on a 1:1 scale. The larger buildings of the proposal use a slight offset to account for extra stories or larger roof spans. This grid was closely followed. Alread (2014:418) states that square bays have the most efficient two-way performance, which results in the thinner floor and roof slabs, the rectangular grid system was thus decided upon for the spaces within the programme.

The market building (restaurant, market, exhibition space and offices) incorporates 4m x 5m structural grid in order to support the large roof span.

The entrance building (workshop, entrance lobby and cafes) incorporates a 5m x 5m structural grid to account for the double story.

The rest of the single-story smaller buildings uses a 4m x 5m structural grid to follow the context of the site.

Substructure

Foundations

The proposal uses two main types of foundation structures. These two types account for the scale of the buildings. The market and workshop facility buildings will make use of the raft type foundation, because of the high clay content found in the soil on site. The healing center will make use of a basic reinforced strip type foundation.

The designing of raft foundations happens when the topsoil is taken away, the revealed surface is then roughly formed in the shape and profile of the bottom of the slab that is going to be used. Where necessary, a 100mm layer of hardcore filling/concrete is used under that area of the raft. 50mm blinding concrete is leveled and shaped as the base layer for the raft foundation. This foundation can then properly transmit the building load into the ground.

Superstructure

Steel Frame Construction

A steel frame structure is incorporated into all the buildings proposed in the design. The structure was chosen for a number of reasons, namely, touches the earth lightly, linkage to the steel cages found on the site, and the lightweight tectonic form of the system also closely relates to the theoretical approach of the design (social and ecological justice). This system has low disruption levels with the site it is used upon, as well as being more environmentally friendly through less use of water and faster assembly times. Steel frame systems can include multiple natural processes and is a more environmentally friendly and sustainable option than traditional building methods. This ties in well with the theoretical approach mentioned in the research.

The frame is composed of steel column and beam elements placed on the structural grid, supporting lightweight steel infill wall panels, masonry infill walls, stone cladding and lightweight steel roof trusses. These structures will have concrete floor decking, which will be able to support the necessary weight as defined by the accommodation list. The stone on site will be reflected in the buildings through 'half wall' stone cladding, with the light steel structure extending beyond this to emphasize the lighter structure (stereotomic) coming from, the heavier tectonic stone(earth). The external envelope of the building will exist from modular panels of fixed and unfixed(vented) glazing allowing for light and air transmittance within the structure. The structural system will also allow for non-load bearing infill walls for flexibility in design. The steel structure accommodates the preferred characteristics of ease of erection and the use of prefabricated members to be assembled on site.

Floor system

The system used for the floors in the design proposal will be pre-stressed hollow core concrete slabs, these slabs will fit into the steel frame system. The pre-stressed slab panels are constructed with hollow cores running through the length of it. They will also be reinforced with high-tensile pre-stressed wires. The combination of hollow cores and high-strength concrete allows the concrete floor system to be relatively lightweight whilst still being able to endure loads and be durable (Perfect Slabs, 2018).

Hollow core slabs hold various benefits. The installation of this system for the floors are cost and time-efficient. The slabs used in the proposal will be Perfect Slabs 150mm pre-stressed hollow-core slabs. Perfect slabs is a local company in Bloemfontein, being located so close to the proposal it will cut down on transport and delivery cost as well as supporting local businesses. 80mm self-leveling screed will be cast as the final layer to the concrete slab as the finished floor level.

Building Services and Safety Requirements

Portal Frame Structure

The portal frame type structure will be used throughout the design proposal. Portal frames are defined by low-rise structures that are made out of I beam columns connected through moment resistant connections to pitched beams. Bracing of these frames is achieved through cold formed lipped channel purlins. This forms the frame to which the roofing will support and tied to. Ceilings will be tied underneath these frames. Portal frames allow for large open floor space as there are less obstructive bracing present, a prime choice for the type of building spaces used in the design like workshops and markets. The structure is quite common for pitched roof buildings, being versatile and economical for a large variety of roof and floor spans. The I beams and H columns used for the primary structure are hot rolled whilst the purlins for the superstructure are cold-formed.

Walls

Partitioning walls are used within the buildings to allocated more 'informal' spaces like market stalls, gallery spaces and offices. Infill masonry walls are used in the buildings to allocate the more formal spaces such as bathrooms, storage, bathrooms and the restaurant. The structural grid served as a guideline when forming these spaces, as the column spacing gave indications to where these spaces can be created. Windows surround the buildings exterior perimeter, except on the southern sides where more of the services are found. These windows are all double glazed infill panels, connecting the interior to the exterior through visualization. The glazing allows for sufficient natural lighting to filter into the buildings, operable windows also allow for cross ventilation

The non-load bearing half infill walls are composed of two exterior skins of stone cladding, with a layer of ISOBOARD in the center to insulate the buildings. The full load-bearing walls are 330mm masonry cavity walls with ISOBOARD as insulation in the center. The insulation is used with the aim of adding effective thermal mass to the buildings, and this helps moderate the interior temperatures.

Building Services and Safety Requirements

Universal accessibility

The national Building Regulations of South African states that

Fresh air and thermal comfort

Sufficient Lighting

Solar Panels

The harvesting and harnessing of the heat and light generated from the sun is called solar energy. There are forms of solar technology that can store and make this energy available to humans as an energy source. This source of energy is renewable and can be used in buildings to heat and light buildings through passive solar design and electrical generation (Jones, 2009:1). Systems that generate electricity through solar energy use a photovoltaic system to achieve this. (SAPVIA, 2017). These systems are applicable to the location of the site, as Bloemfontein has an annual average of 3300 hours of sunlight exposure. (World Weather and Climate Information, 2016) Including these photovoltaic solar panels in the design, the proposal is a sure way of reducing the use of non-renewable energy sources. The proposed panels for this project are polycrystalline cells, these panels are slightly less efficient, but make up for this in cost efficiency, form factor weight and flexibility (Sendy, 2017). These panels, more specifically the 'EnerSol' 250 Watt Polycrystalline solar cells, will be mounted on the north-facing curved roofs of the projects.

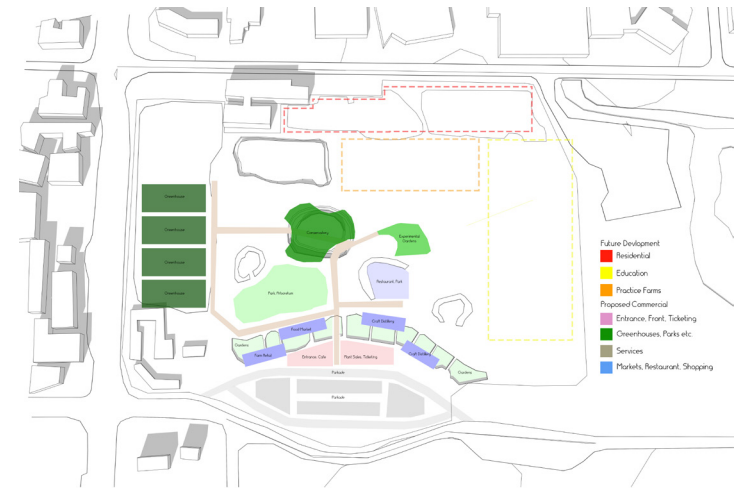
Chapter 6: Design synthesis

6.1 Design development

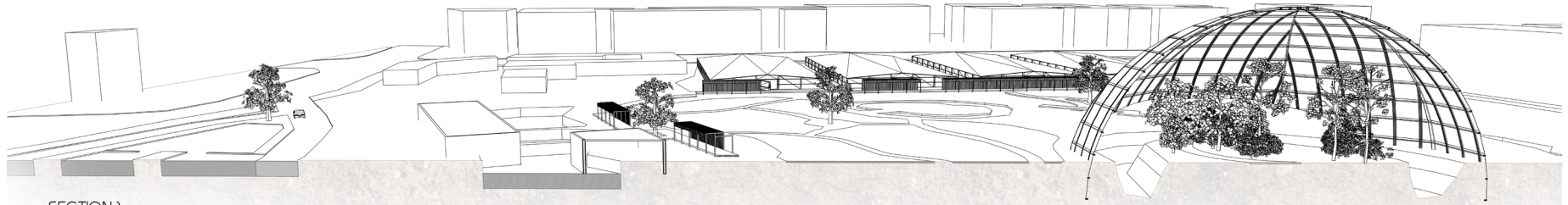
6.1.1 First proposal



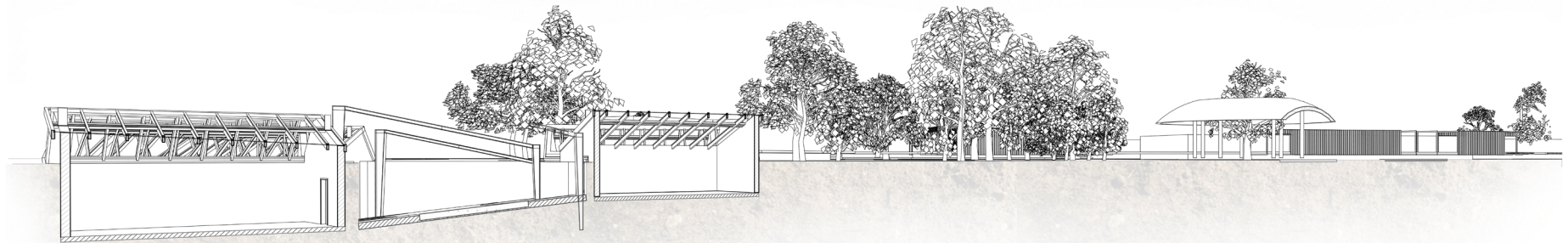
The first design was a more extensive landscape proposal, sprawling over the whole site of King's Park, this was immediately seen as unfeasible and was not developed further.



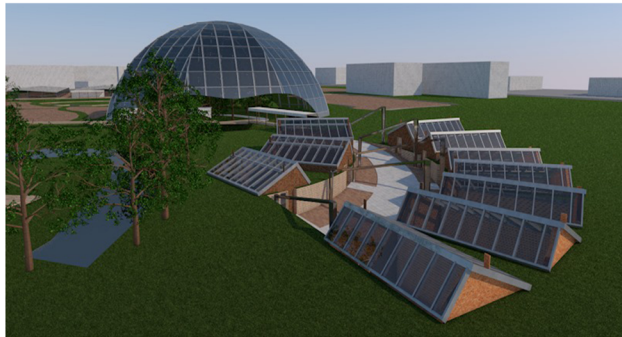
The programme was extended more towards education, commercial and residential.

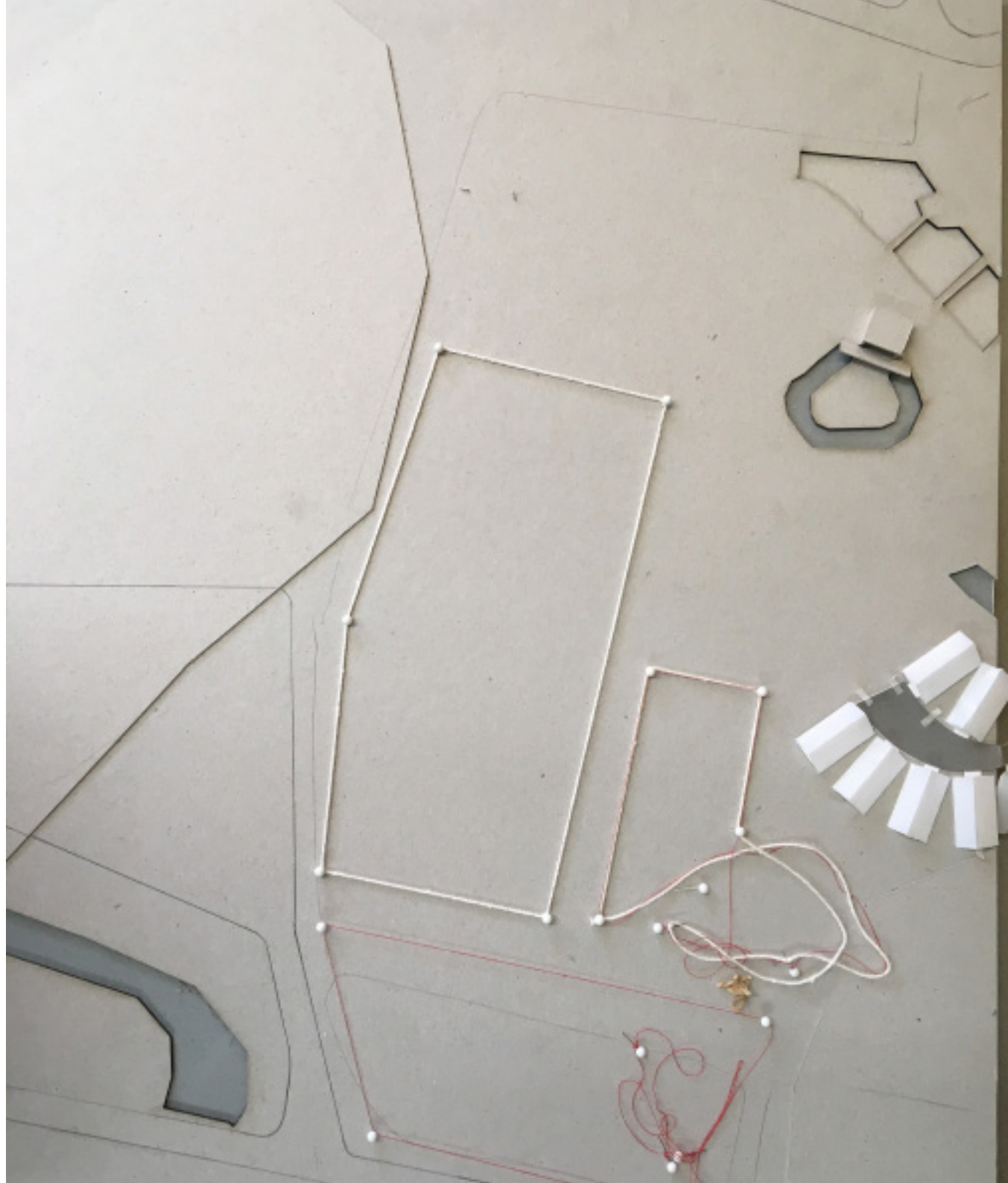


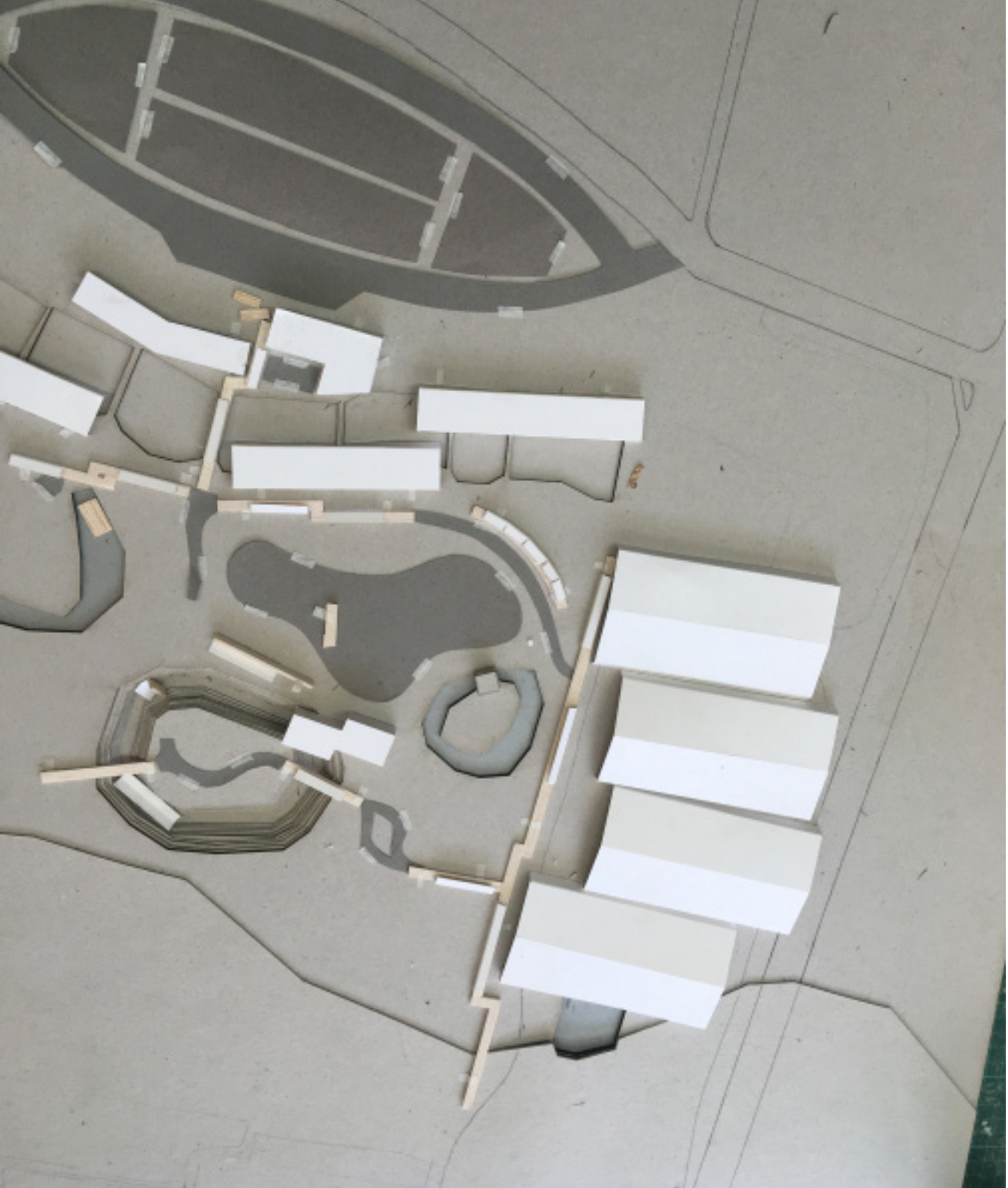
SECTION 1



SECTION 2





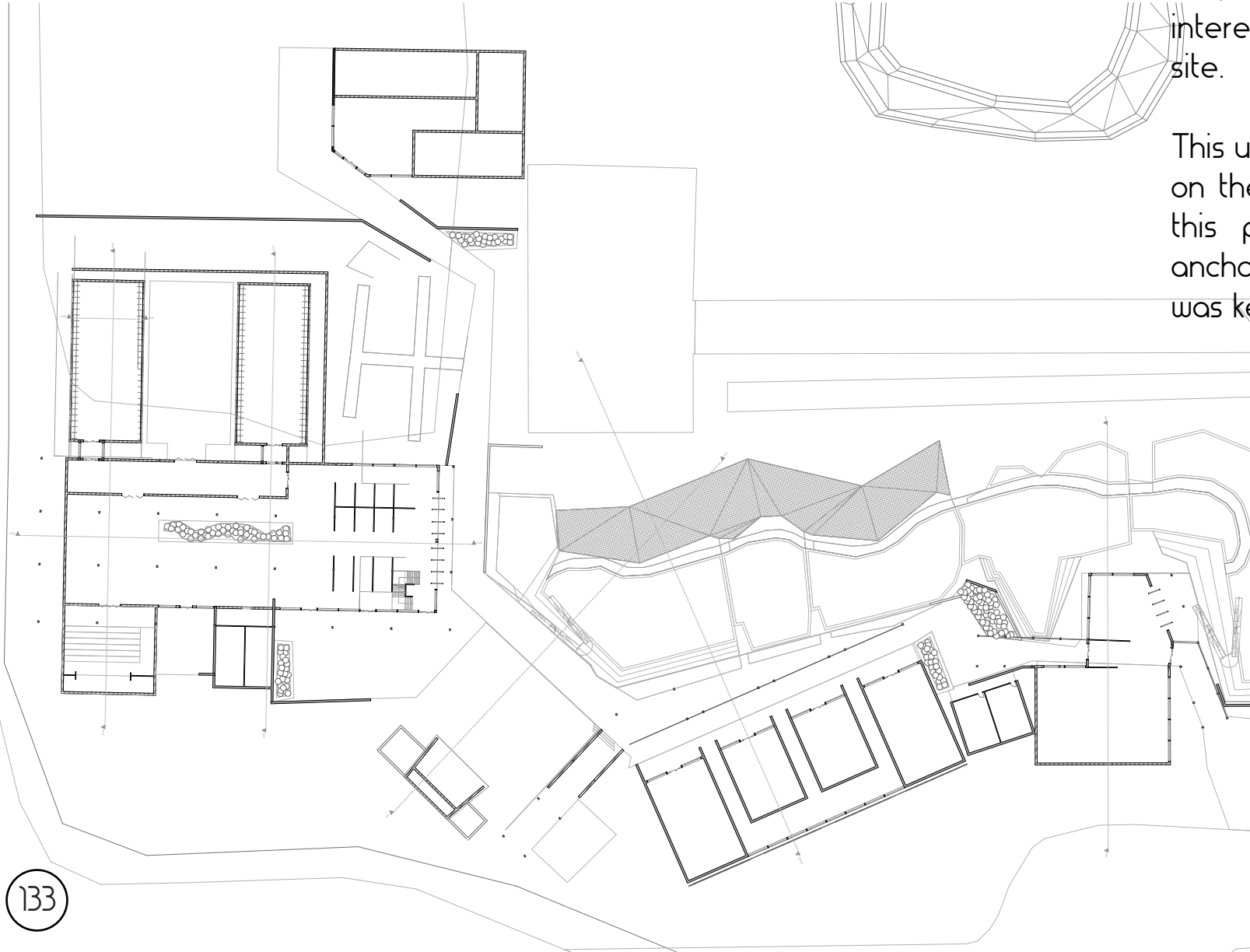


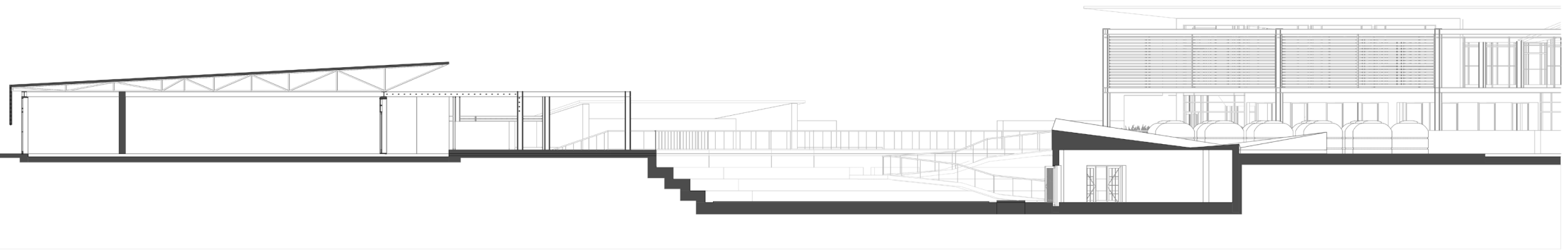
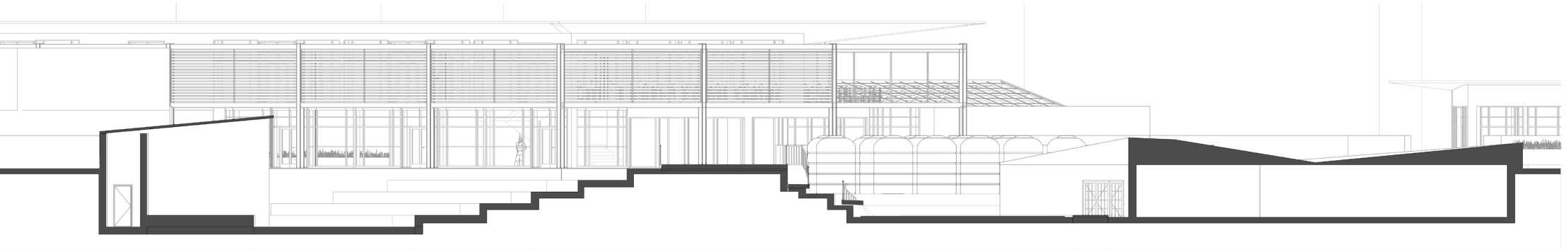
6.1 Design development

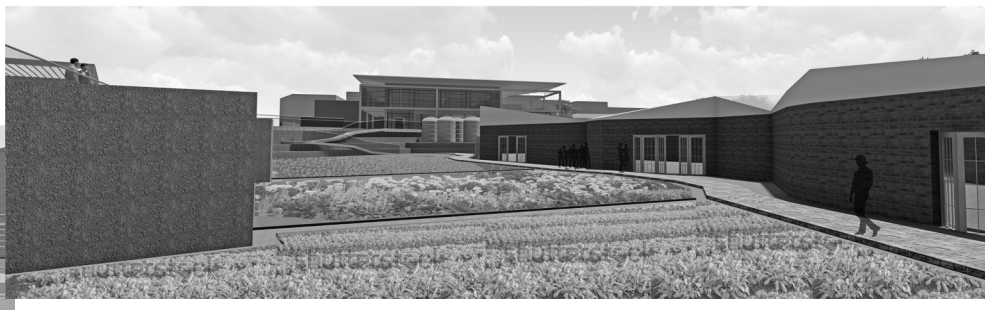
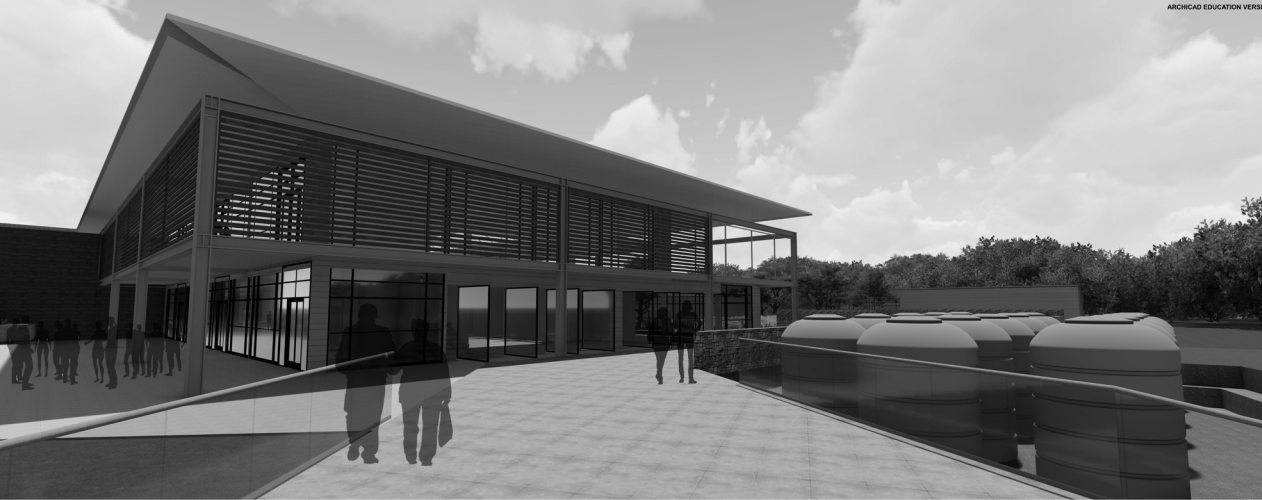
6.1.2 Second Proposal

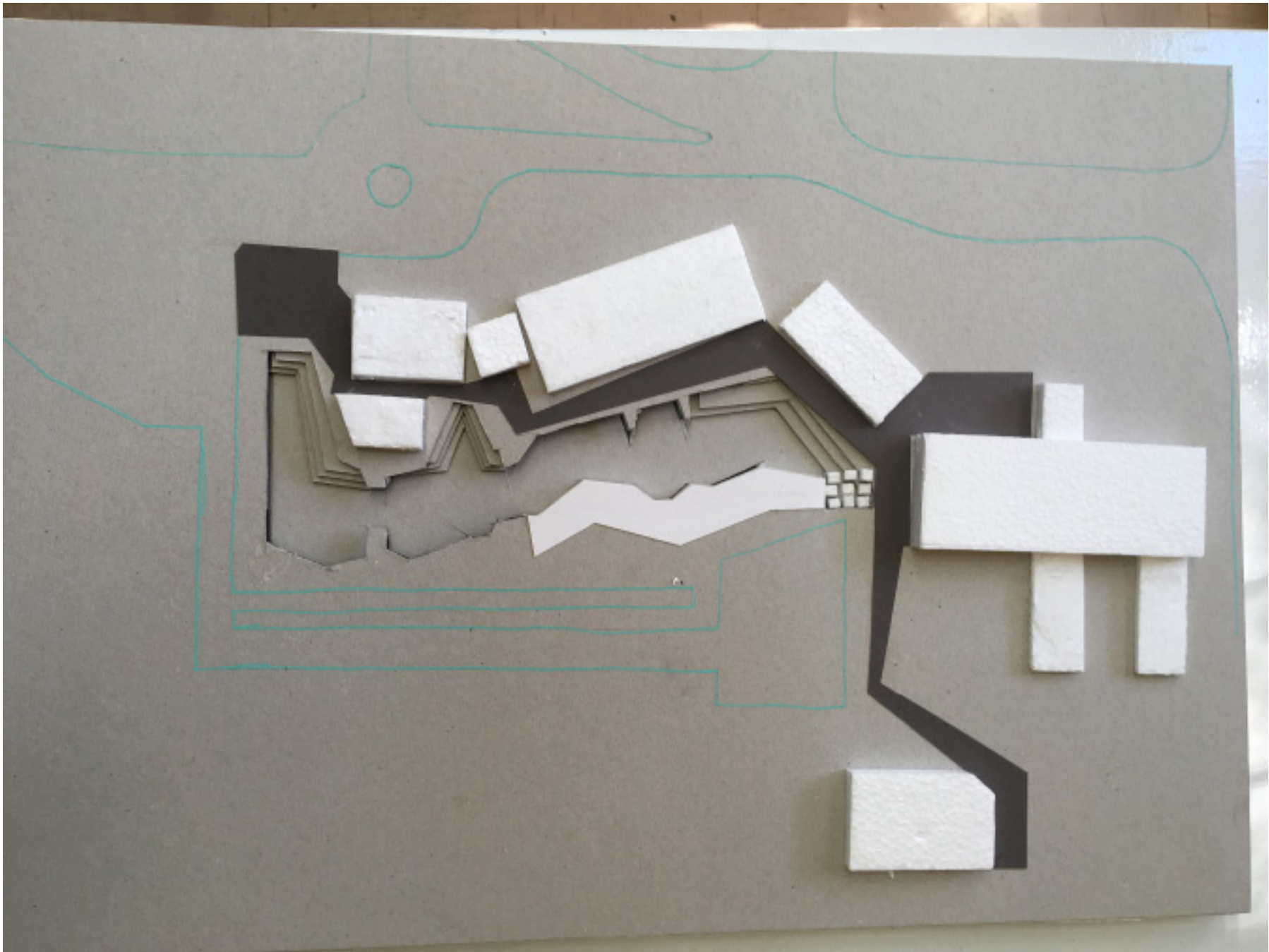
The second design proposal was more aimed to appropriate the south-western boundary of the site, with the intent of creating interest from the traffic passing the site.

This use of the rock cages footprint on the site was introduced during this proposal, with the facilities anchored to the layout. This idea was kept.



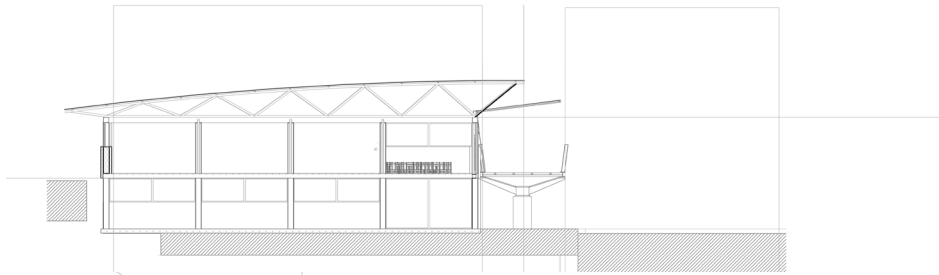






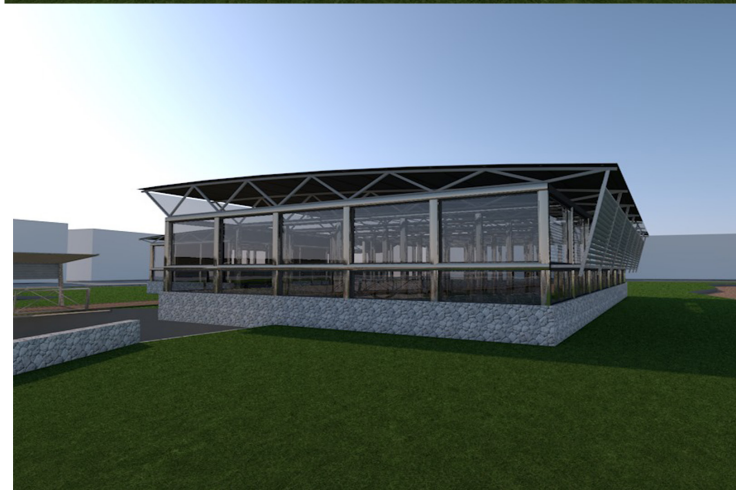
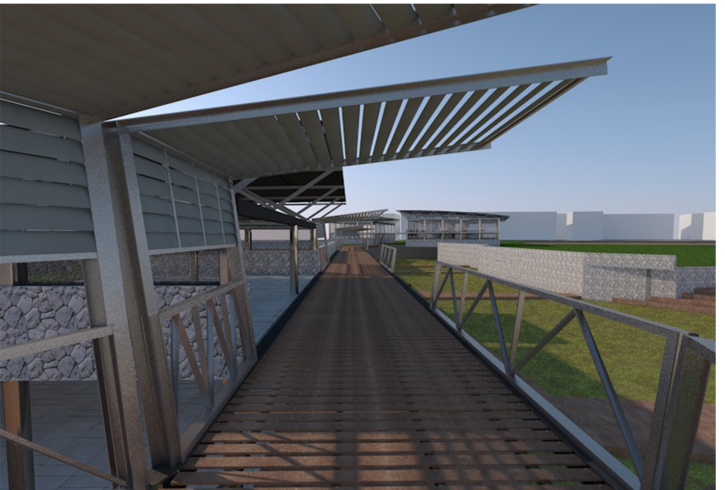
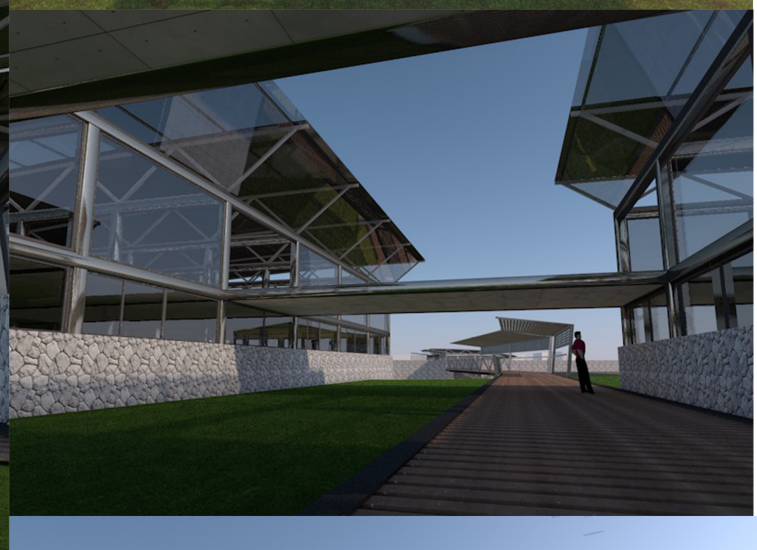
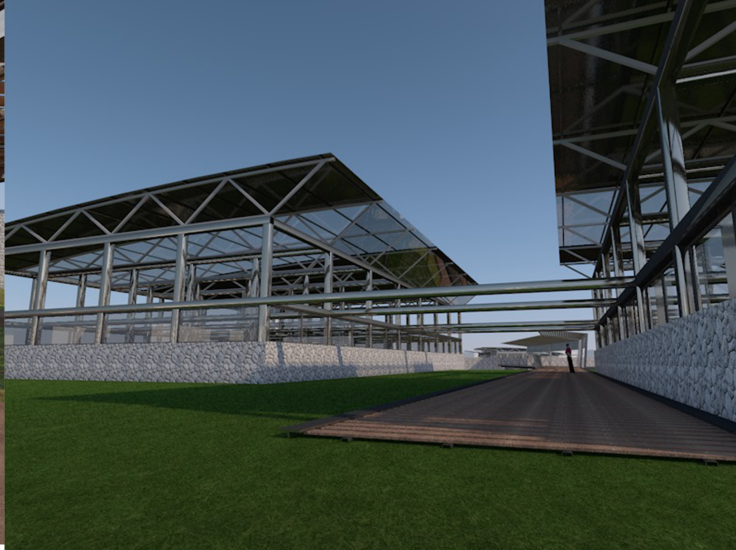
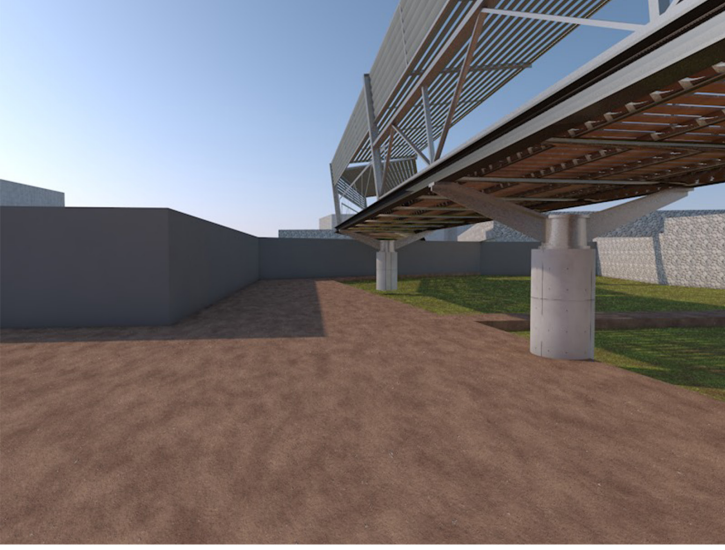
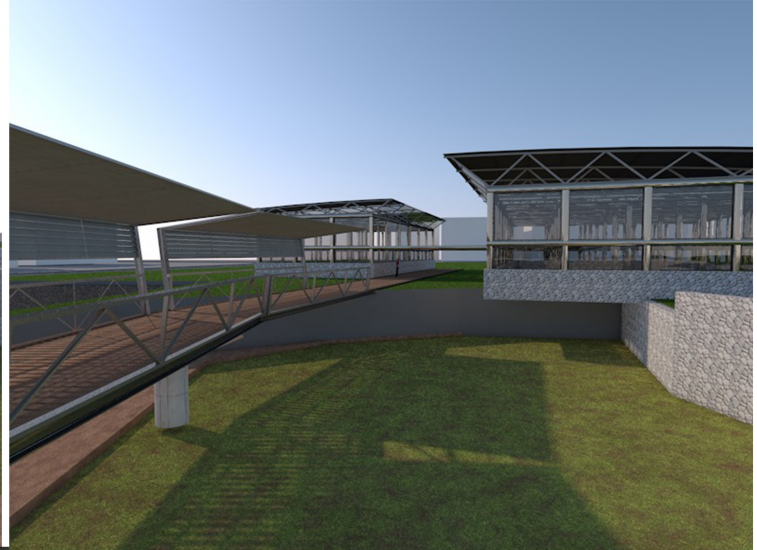
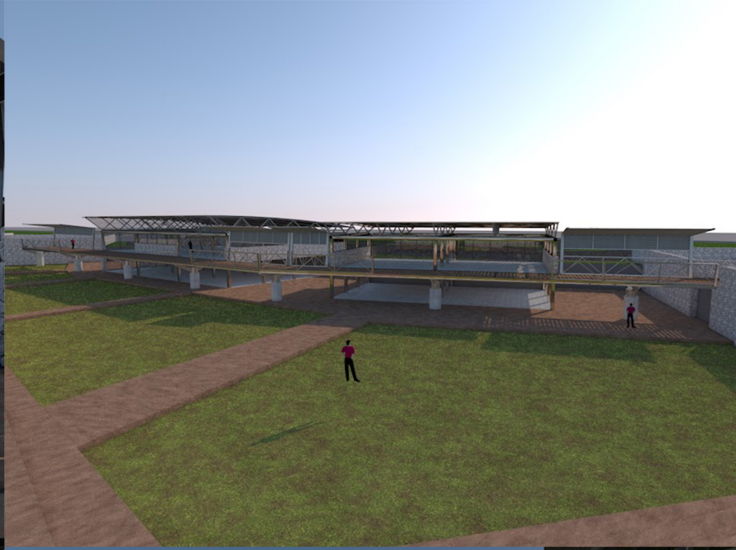
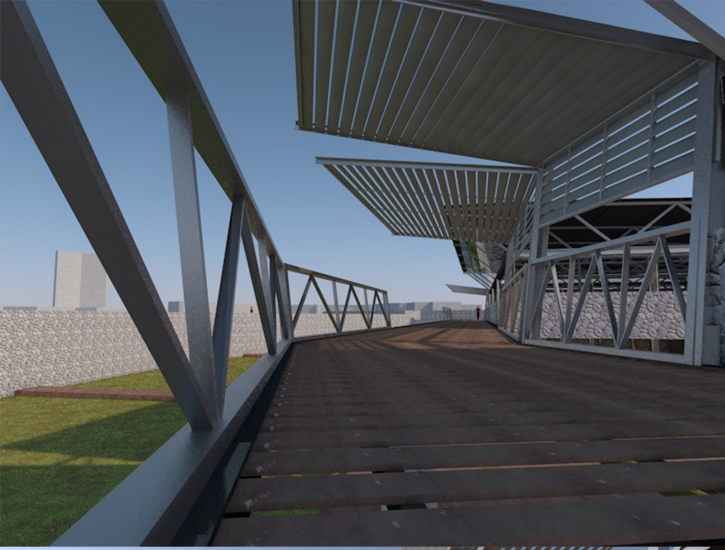
6.1 Design development

6.1.2 Third Proposal



The third proposal was the last one before final decisions were made. This design had some significant problems that were focused on for the last iteration

The main structure, or skeleton, of the project, more or less remained the same, with key changes being made to the raised problems.







PART 4:

FINAL DESIGN





URBAN GRAFT

GARDEN MAP

1 FRAGRANT ENTRANCE
Lavender, Buddleja and various other scents welcome guests to King's Park

2 VERTICAL CIRCULATION
Guest are greeted by various ways of interacting with the site

3 EXHITION
Exhibition space display community artwork and crafts, a permanent museum exhibition tells the story and history of King's Park

4 MARKET
Market place with a restaurant entices guests to come and join community markets and enjoy a meal while overlooking the garden ensemble

5 RETAIL
Local produced products are sold in a variety of shops, from pot pourri and essential oils, craft beer and gin as well as fresh herbal tea's

6 HEALING
A traditional healing center welcomes guests to alleviate the stresses of the mind and the soul. Traditional indigenous plants offer a variety of benefits, from mood enhancers to insomnia remedies. A Yoga studio extends the facilities, therapy consultations and an auditorium for small readings and lectures can also be found here.

7 WORKSHOPS
Visitors can come and expand their knowledge on brewing, distilling, plant processing and gardening techniques. Practical learning workshops and demonstrations will be held here to empower the community. Garden tours are hosted every morning where the visitors will be guided through the intricacies of the garden.

8 MEDITATION GARDEN
The healing center garden offers a tranquil environment where one could get away from the bustle of the city. A meditation space, hebal tea brewing stand and outdoor discussion area are but some of the things to be found here.

9 HERBAL GARDEN
A selection of herbal plants can be found here, ranging from Buchu teas and locally grown Tobacco and Cannabis strains. This garden facilitates the workshop, visitors can harvest and process these plants themselves.

10 ESSENTIAL GARDEN
A selection of essential oil plants can be found here, ranging from Honeybus and Lavender to Rosemary and Chamomile. Visitors can harvest and create their own essential oils themselves at the workshop

11 EDIBLE GARDEN
This garden facilitates to the restaurant and market, these selected plants will be used in fresh dishes, cocktails and snacks. Including a pond with aquatic edible plants.

12 ORNAMENTAL GARDEN
Selected areas create visually pleasing approaches to the various functions of the ensemble.

13 PLAY AREAS
Playgrounds for kids allows parents to rest and enjoy the facilities whilst their children frolic on slides and swings. The inclusion of child needs are also adressed by providing areas of play

14 AMPHITHEATRE
An 1000 person capacity amphitheatre provides the public with space for local performances, product launches and readings





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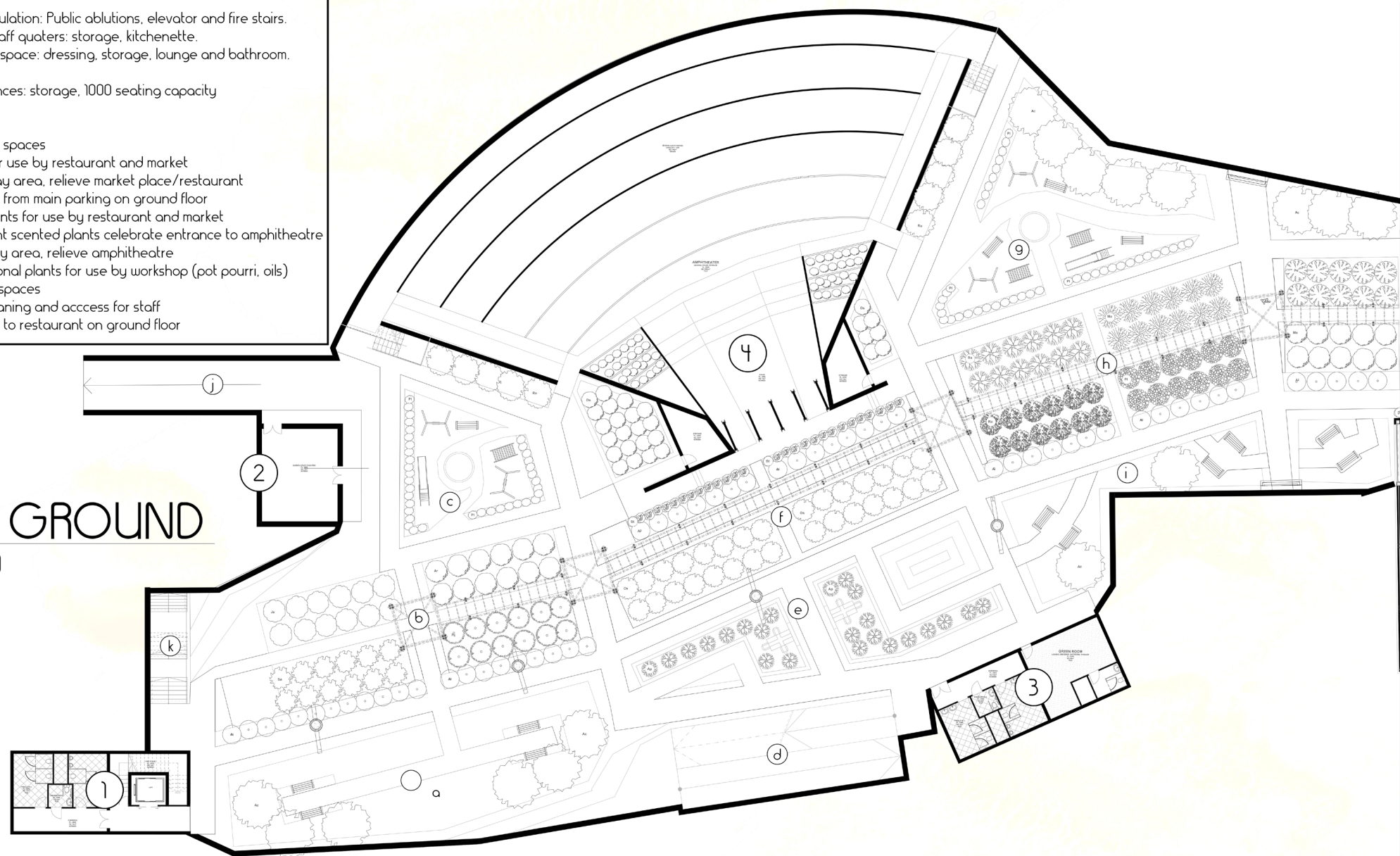
1

- Programme
1. Access point, vertical circulation: Public ablutions, elevator and fire stairs.
 2. Garden shed, garden staff quaters: storage, kitchenette.
 3. Green room, performers space: dressing, storage, lounge and bathroom.
 3. Ablution, garden visitors
 4. Amphitheatre, performances: storage, 1000 seating capacity

- Garden landscaping
- a) tranquil garden: seating spaces
 - b) edible garden: plants for use by restaurant and market
 - c) playground: children play area, relieve market place/restaurant
 - d) vertical circulation: ramp from main parking on ground floor
 - e) pond: edible aquatic plants for use by restaurant and market
 - f) fragrant garden: pleasant scented plants celebrate entrance to amphitheatre
 - g) playground: children play area, relieve amphitheatre
 - h) essential garden: functional plants for use by workshop (pot pourri, oils)
 - i) tranquil garden: seating spaces
 - j) service road: garden cleaning and access for staff
 - k) vertical circulation: stairs to restaurant on ground floor

LOWER GROUND

SCALE 1:500



Fragrant Garden:

St	Strelizia	Crane flower	Iconic flower
Ai	Aizoaceae Martynov	Vygie	Colorful
Os	Osteospermum	Daisies Variety	Colorful

Essential Garden:

Rs	Rosmarinus officinalis	Rosemary	Essential oils Balms Pot Pourri Drying etc.
Ma	Matricaria chamomilla	Chamomile	
Pt	Pelargonium tomentosum	Peppermint	
Pt	Pelargonium tomentosum	Rose Geranium	
Os	Osteospermum officinalis	Lemon Balm	
La	Lavandula stoechas	Lavender	

General Landscaping

Ac	Acacia vachellia	Acacia	Local trees
Ai	Aizoaceae Martynov	Vygie	Colorful
Pl	Plumbago auriculata	Blue plumbago	Striking blue
Ro	Rothmannia globosa	September bell	Pleasant scent

Edible Garden

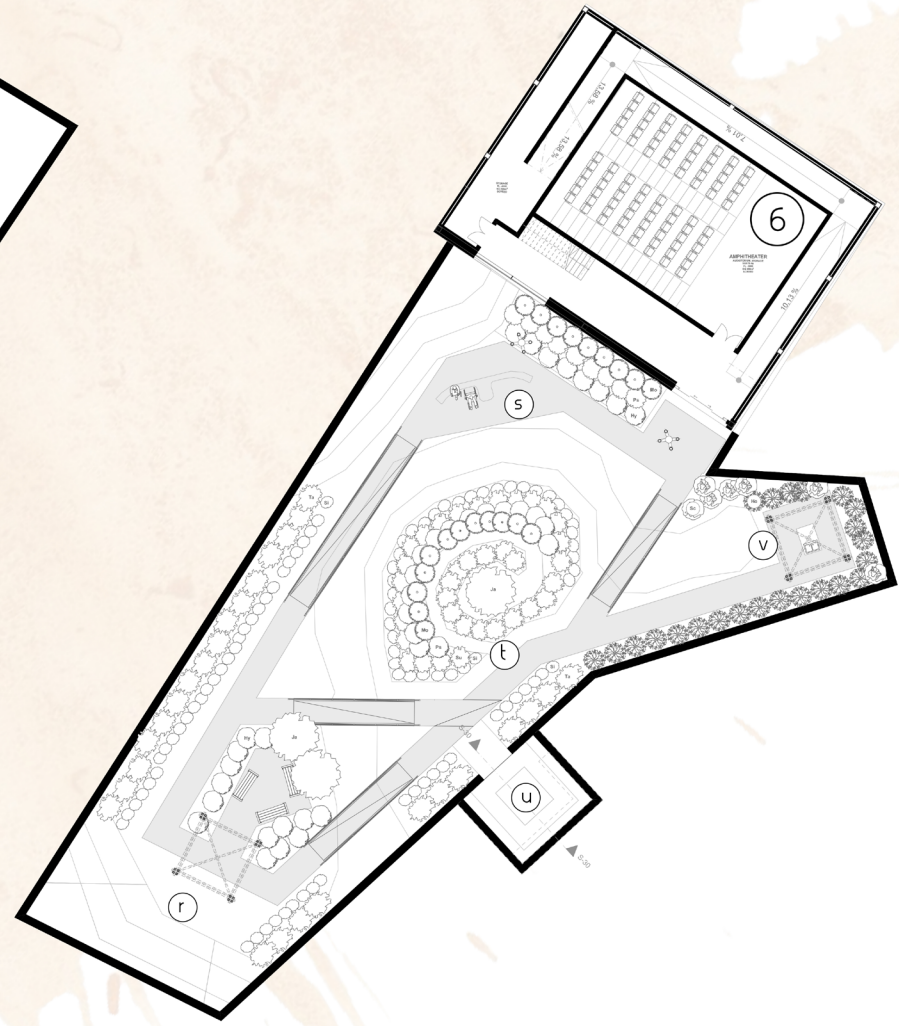
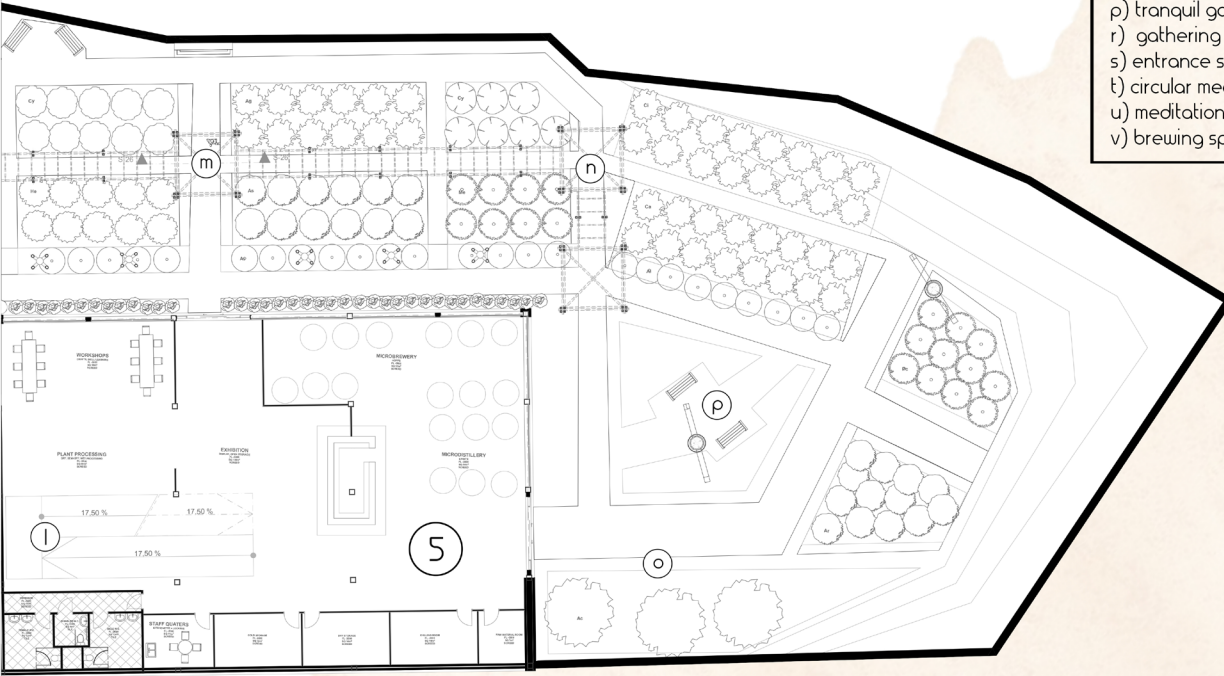
Ja	Jasminum multipartitum	Many-petalled jasmine	Flavoring, garnish
Sa	Salvia africana lutea	Aromatic Sage	Herb, garnish
Ar	Artemesia afra	Wormwood	Herbal tea, cocktails
Pc	Pelargonium culallatum	Wild Malva	Saldas, dressing

Programme

- 5. Workshop: Micro-distillery, micro-brewery, workshop, plant processing, information
- 6. Healing garden: meditational garden, plants with healing properties and calming spaces
- 7. Auditorium: Seats 60 people, small conferences, ramp and stair access to ground floor

Garden landscaping

- l) vertical circulation: ramp to ground floor, access
- m) tea garden: brewing and distilling plants for use by workshop (tea, coffee, beer)
- n) herbal garden: dryable/smokable plants for use by workshop (tobacco, cannabis)
- o) garden tour: assembly area for visitors tour
- p) tranquil garden: seating spaces
- r) gathering space: small terraced steps area for talks
- s) entrance space: calming stones, stream and seating
- t) circular meditation: central tree, seating
- u) meditation space: chapel like area, seating, reflection pond and skylight
- v) brewing space: brewing of herbal teas and tinctures.



Tea Garden:

Cy	Cymbopogon	Lemongrass	Oil, herbal
He	Helichrysum populifolium	Helichrysum	Oil, herbal
Ag	Agathosma	Buchu	Tea, herbal
As	Aspalathus linearis	Rooi Bos	Tea, herbal

Herbal Garden:

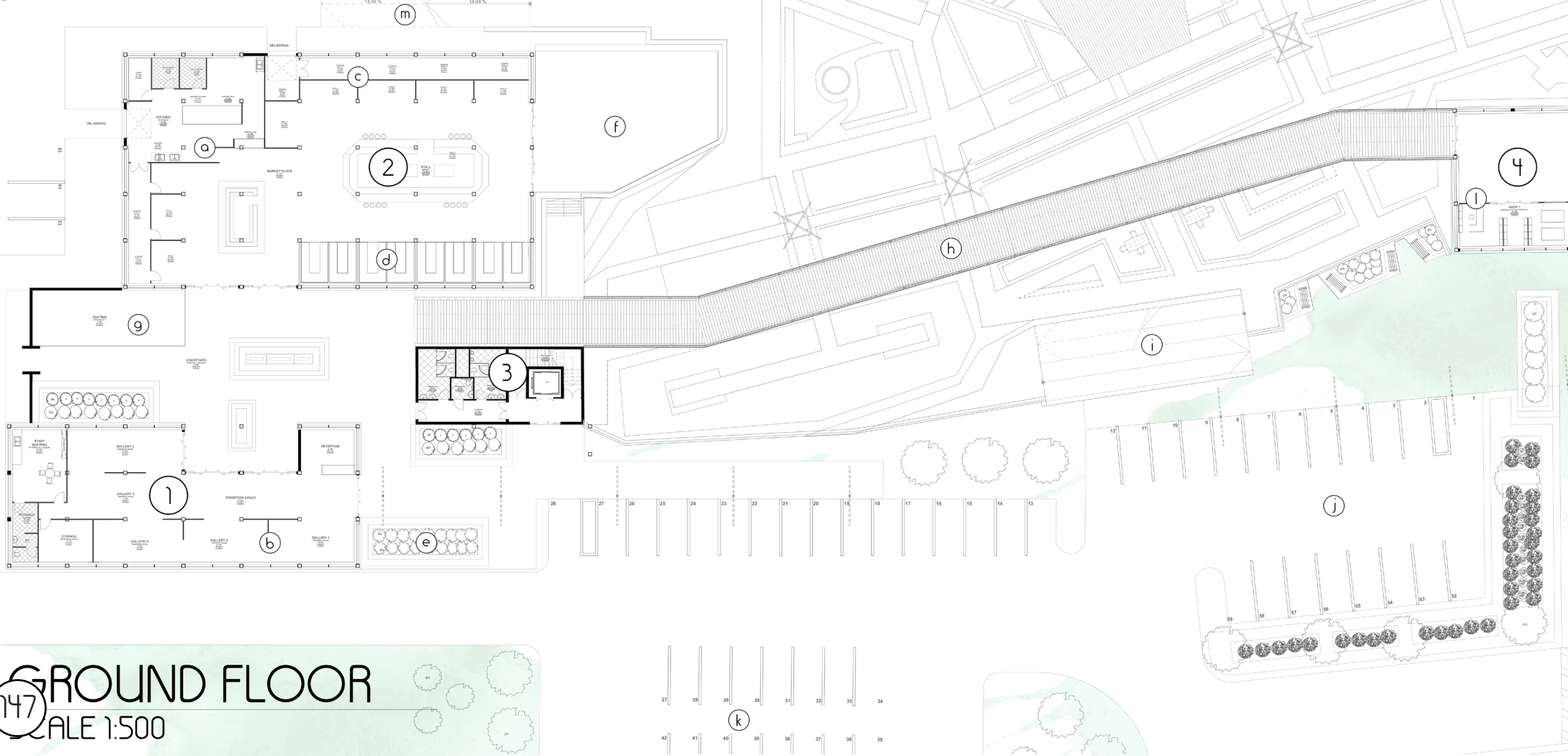
Cg	Cyclopia genistoides	Honeybush	Tea, herbal
Me	Melissa officinalis	Lemon balm	Oil, herbal
Nt	Nicotiana tabacum	Tabacco virginia	Drying, smoking
Ca	Cannabis	Indica, Sativa	Drying, smoking
Ag	Agathosma	Buchu	Tea, herbal
Ar	Artemis afra	Wormwood	Tea, herbal

Healing Garden:

Mo	Moringa oleifera	Moringa	Headaches
Ps	Pelargonium sidoides	Kalwerbossie	fatigue and weakness
Hl	Hypoxis hemmercalidea	African potato	heart weakness, depression
Sc	Sceletium tortuosum	Kougoed	Anxiety and depression
Ho	Hoodia gordonii	Bobbejaanghaap	Appetite suppressant, mood enhancer
Ta	Tarhnonanthus camphoratus	Camphor bush	Headaches, insomnia
Si	Siphonochilus aethiopicus	African ginger	Appetite suppressant and sedative
Su	Sutherlandia frutescens	Cancer bush	Stress and anxiety
Ja	Jacaranda mimosifolia	Jacaranda	Mental enfeeblement

- Programme
- 1. Museum: exhibition: temporary and permanent display space, staff quaters and kitchenette, storage.
 - 2. Market, restaurant: market stalls, cafe and information, inside and outside seating and deliveries
 - 3. Access point, vertical circulation: Public ablutions, elevator and fire stairs.
 - 4. Entrance: lobby, seating and retail

- Garden landscaping
- a) restaurant kitchen: deliveries, cold and dry storage, preparation and cooking, cleaning and office
 - b) temporary exhibition: exhibition spaces 1-5, storage for displays.
 - c) market stall: stalls 1-7, deliveries and storage, display area.
 - d) seating: seating booths for market, restaurant and cafe
 - e) fragrant garden: pleasant scented plants celebrate entrance to market complex
 - f) outside seating: seating overlooking garden for market, cafe and restaurant
 - g) outside seating: seating in courtyard for market, cafe and restaurant
 - h) suspended walkway: connecting market and workshop over the gardens
 - i) vertical circulation: ramp leading to amphitheatre and garden on lower level
 - j) parking: parkade for market complex
 - k) parking: parkade for market complex
 - l) retail: commercial shop selling workshop produce such as pot pourri
 - m) service road: garden cleaning and access for staff, deliveries



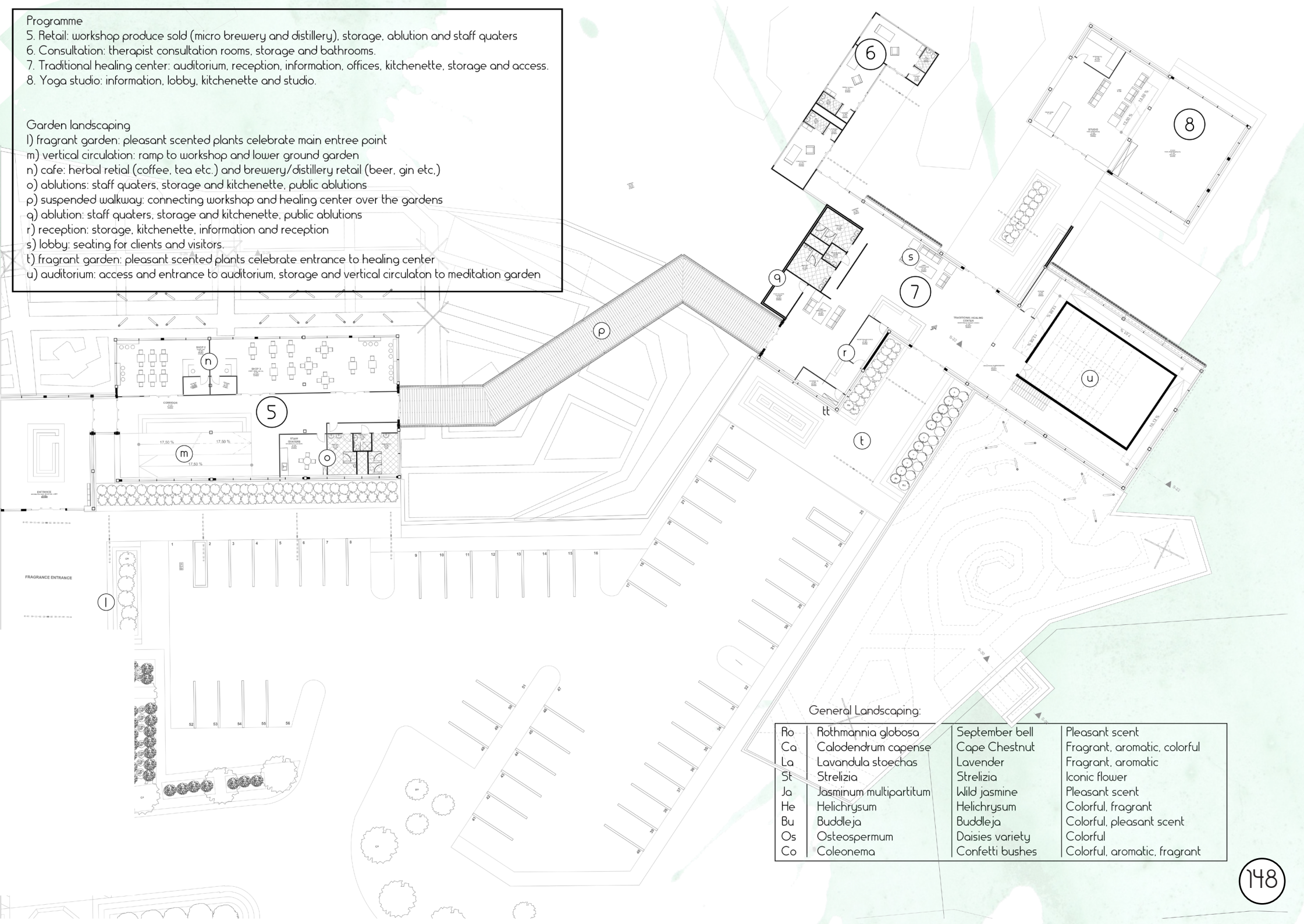
147 GROUND FLOOR
SCALE 1:500

Programme

- 5. Retail: workshop produce sold (micro brewery and distillery), storage, ablution and staff quarters
- 6. Consultation: therapist consultation rooms, storage and bathrooms.
- 7. Traditional healing center: auditorium, reception, information, offices, kitchenette, storage and access.
- 8. Yoga studio: information, lobby, kitchenette and studio.

Garden landscaping

- l) fragrant garden: pleasant scented plants celebrate main entree point
- m) vertical circulation: ramp to workshop and lower ground garden
- n) cafe: herbal retail (coffee, tea etc.) and brewery/distillery retail (beer, gin etc.)
- o) ablutions: staff quarters, storage and kitchenette, public ablutions
- p) suspended walkway: connecting workshop and healing center over the gardens
- q) ablution: staff quarters, storage and kitchenette, public ablutions
- r) reception: storage, kitchenette, information and reception
- s) lobby: seating for clients and visitors.
- t) fragrant garden: pleasant scented plants celebrate entrance to healing center
- u) auditorium: access and entrance to auditorium, storage and vertical circulation to meditation garden



General Landscaping:

Ro	Rothmannia globosa	September bell	Pleasant scent
Ca	Calodendrum capense	Cape Chestnut	Fragrant, aromatic, colorful
La	Lavandula stoechas	Lavender	Fragrant, aromatic
St	Strelizia	Strelizia	Iconic flower
Ja	Jasminum multipartitum	Wild jasmine	Pleasant scent
He	Helichrysum	Helichrysum	Colorful, fragrant
Bu	Buddleja	Buddleja	Colorful, pleasant scent
Os	Osteospermum	Daisies variety	Colorful
Co	Coleonema	Confetti bushes	Colorful, aromatic, fragrant

Programme

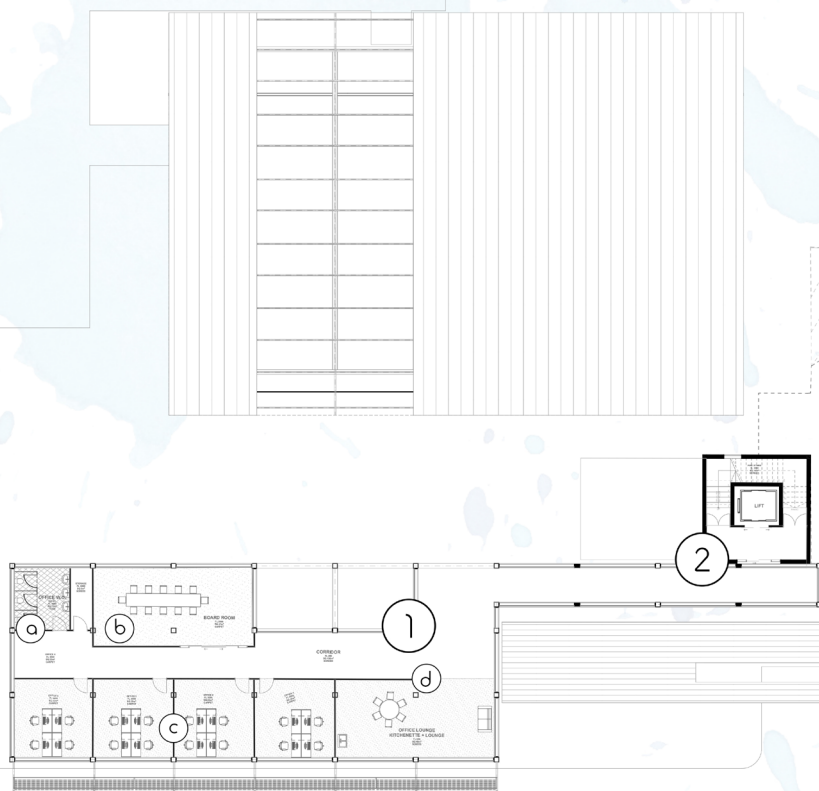
1. Office, administration: office cubicles 1-4, board room, lounge and kitchenette, storage and staff ablution
2. Access point: vertical circulation, elevator and fire stairs

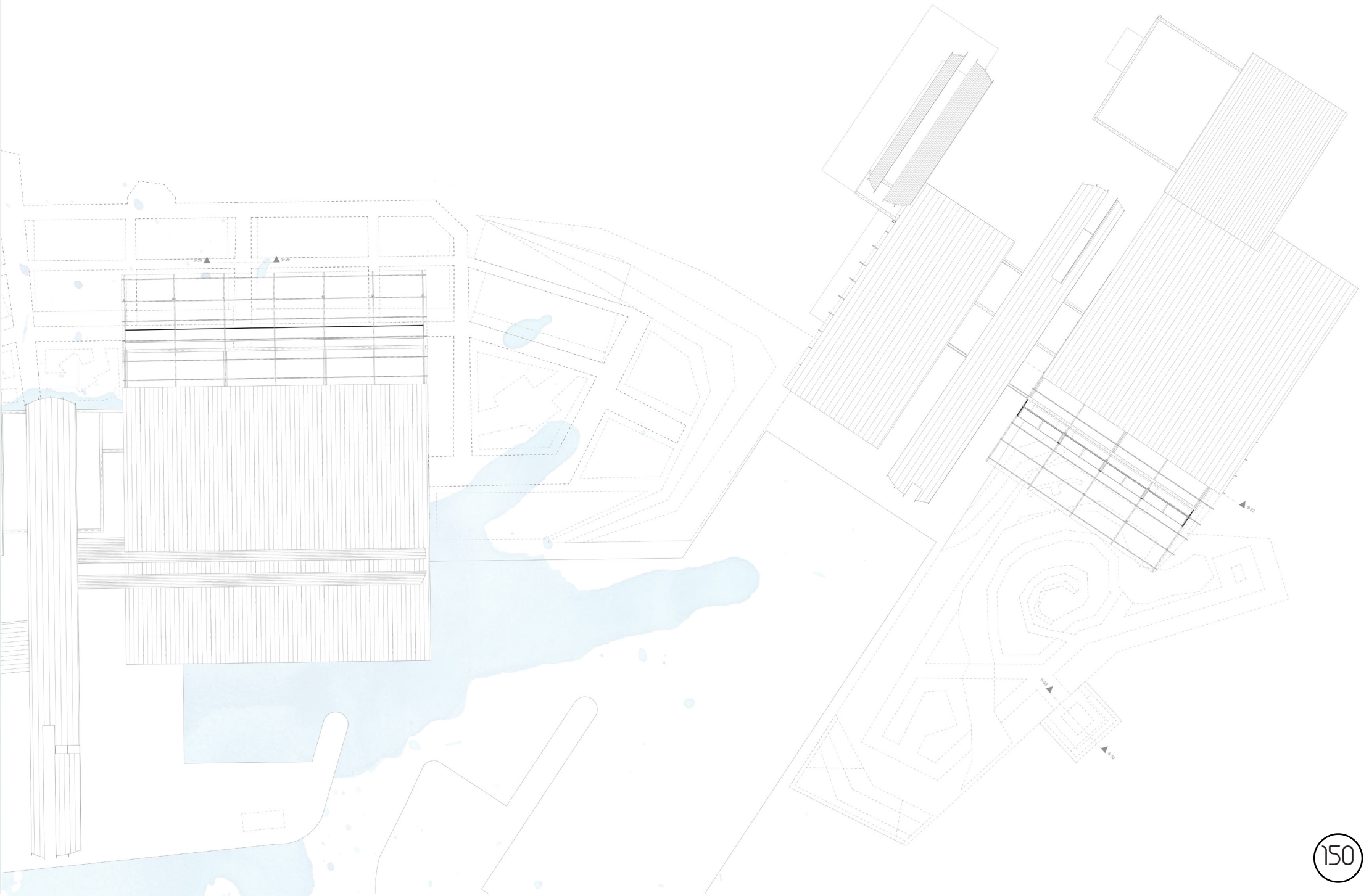
Garden landscaping

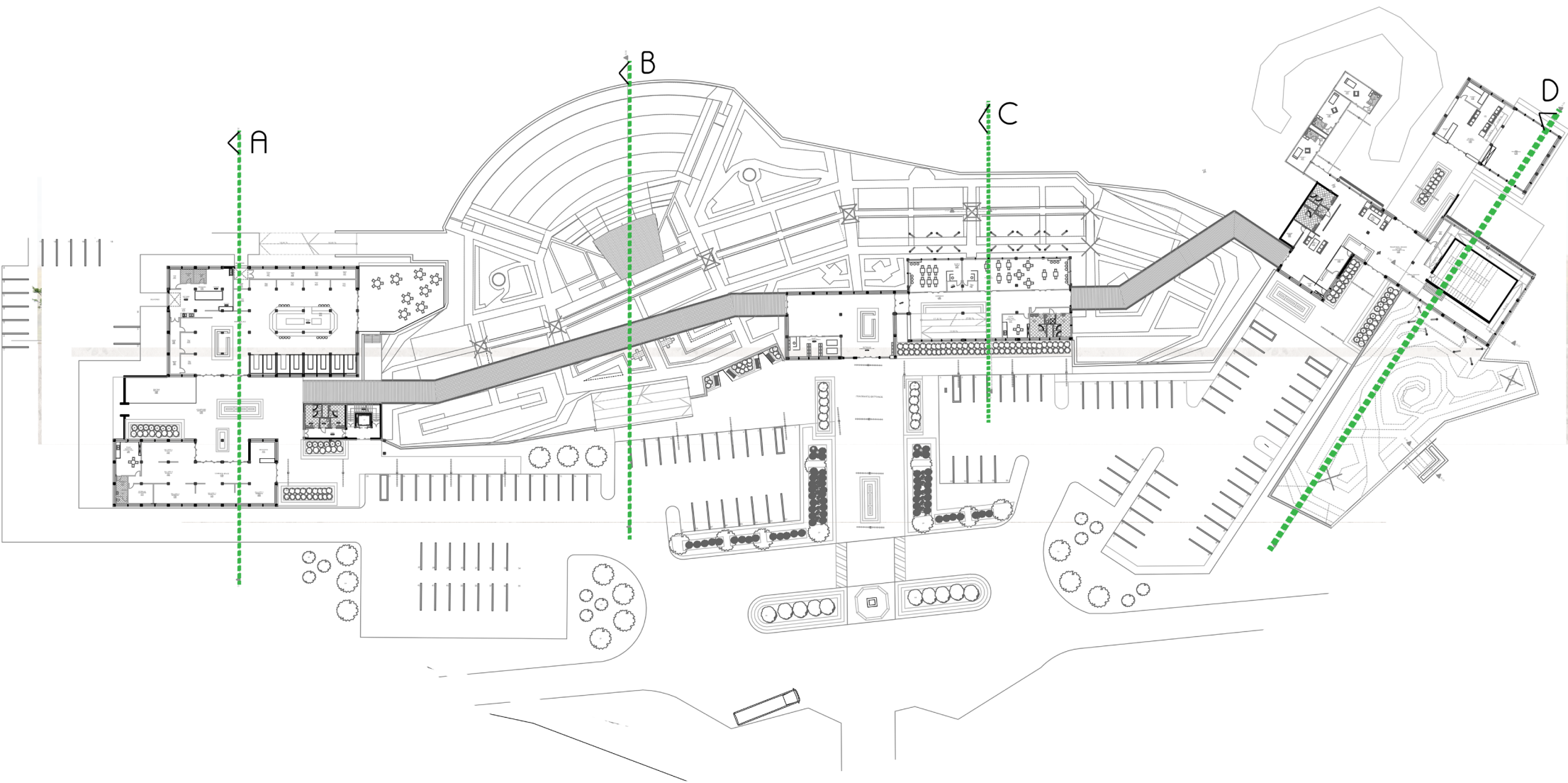
- a) staff bathrooms: co-ed, storage
- b) board room: seats 12 persons
- c) offices: 4 persons per cubicle
- d) lounge: kitchenette, lounge area, circulation space

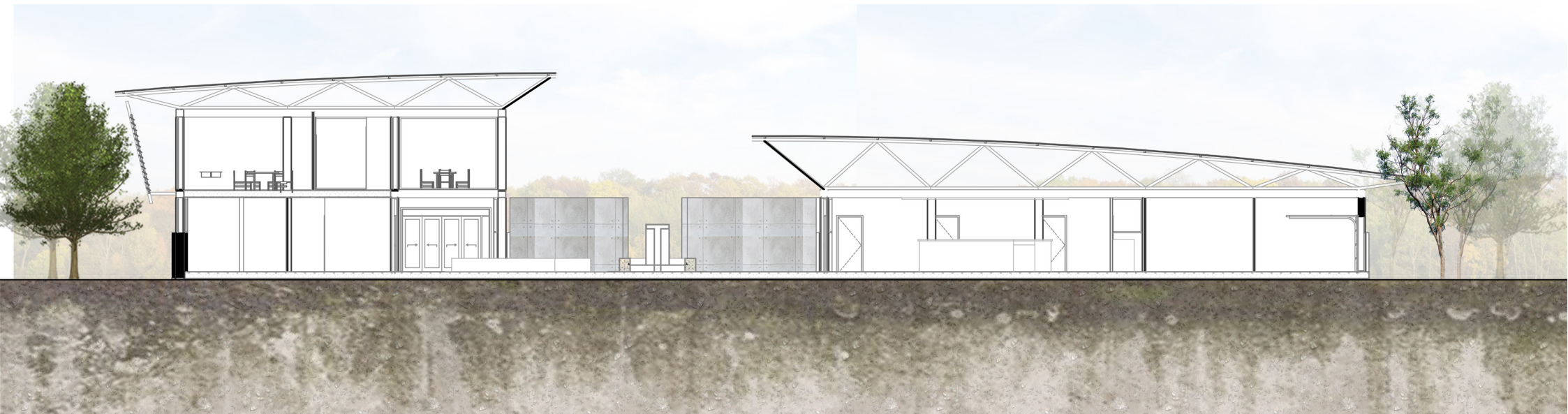
UPPER GROUND

SCALE 1:500



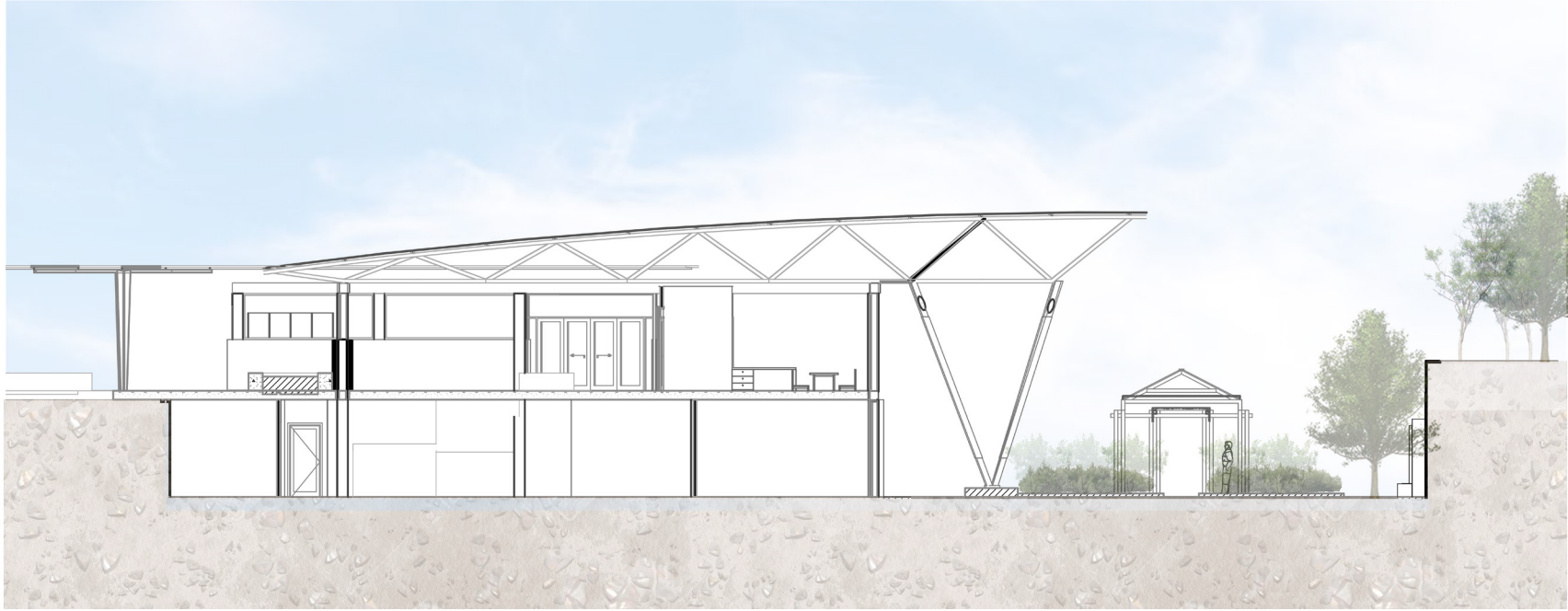




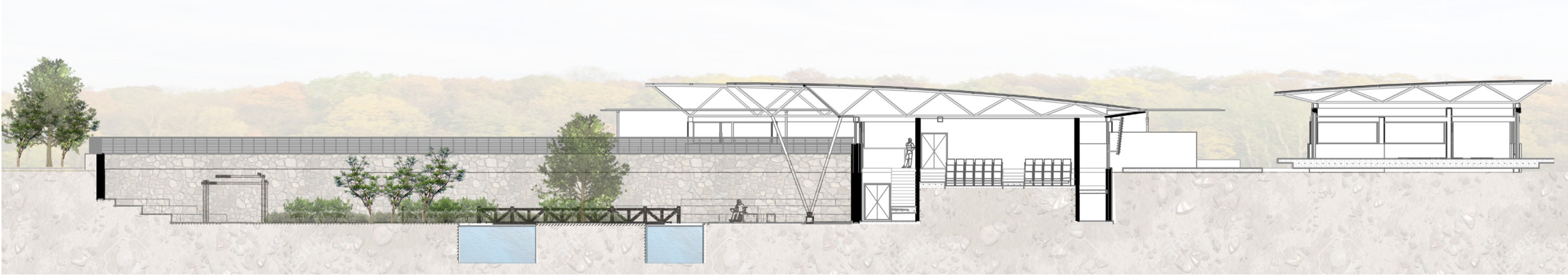


SECTION A-A





SECTION C-C

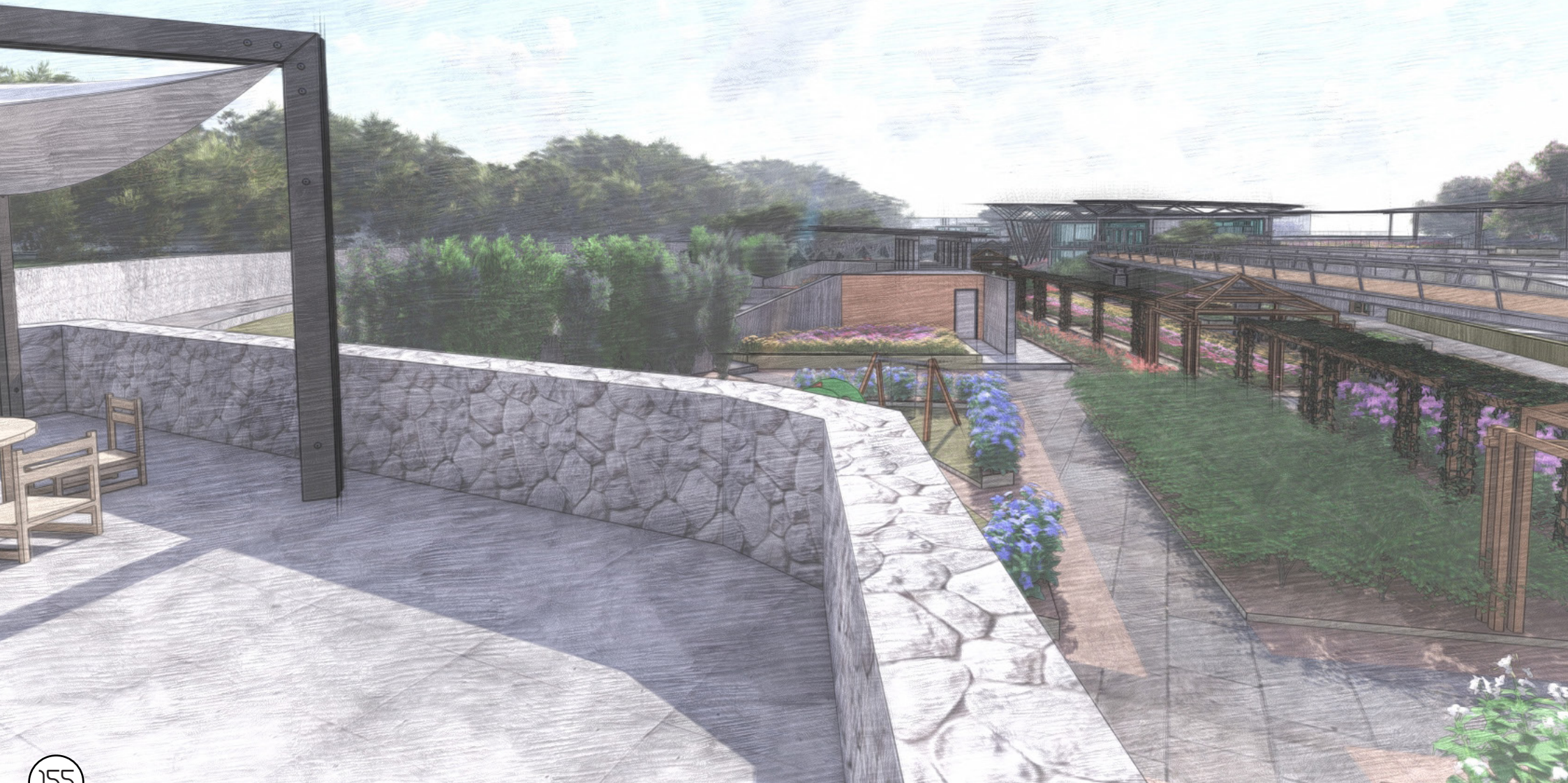


SECTION D-D

Amphitheatre



Garden view from restaurant seating



Courtyard between market and exhibition



Playground by the restaurant and market



Amphitheatre stage view from seating



Garden view from entrance slope



Playground by amphitheatre



Garden view to Workshop



View as you exit workshop



View of garden from healing center



View of parkade from healing center



Meditation garden



Meditation space



An architectural rendering of an outdoor herbal brewing space. The scene is framed by a rustic wooden structure with thick beams and a stone wall. The walls are covered in lush green ivy. In the foreground, a concrete counter with a sink and a gas stove is visible. A paved walkway leads to a garden area with a wooden bridge over a small pond. The garden is filled with various plants, including yellow flowers and a large tree with pink blossoms. The overall atmosphere is serene and natural.

Herbal brewing space

Calming rock feature entrance to garden



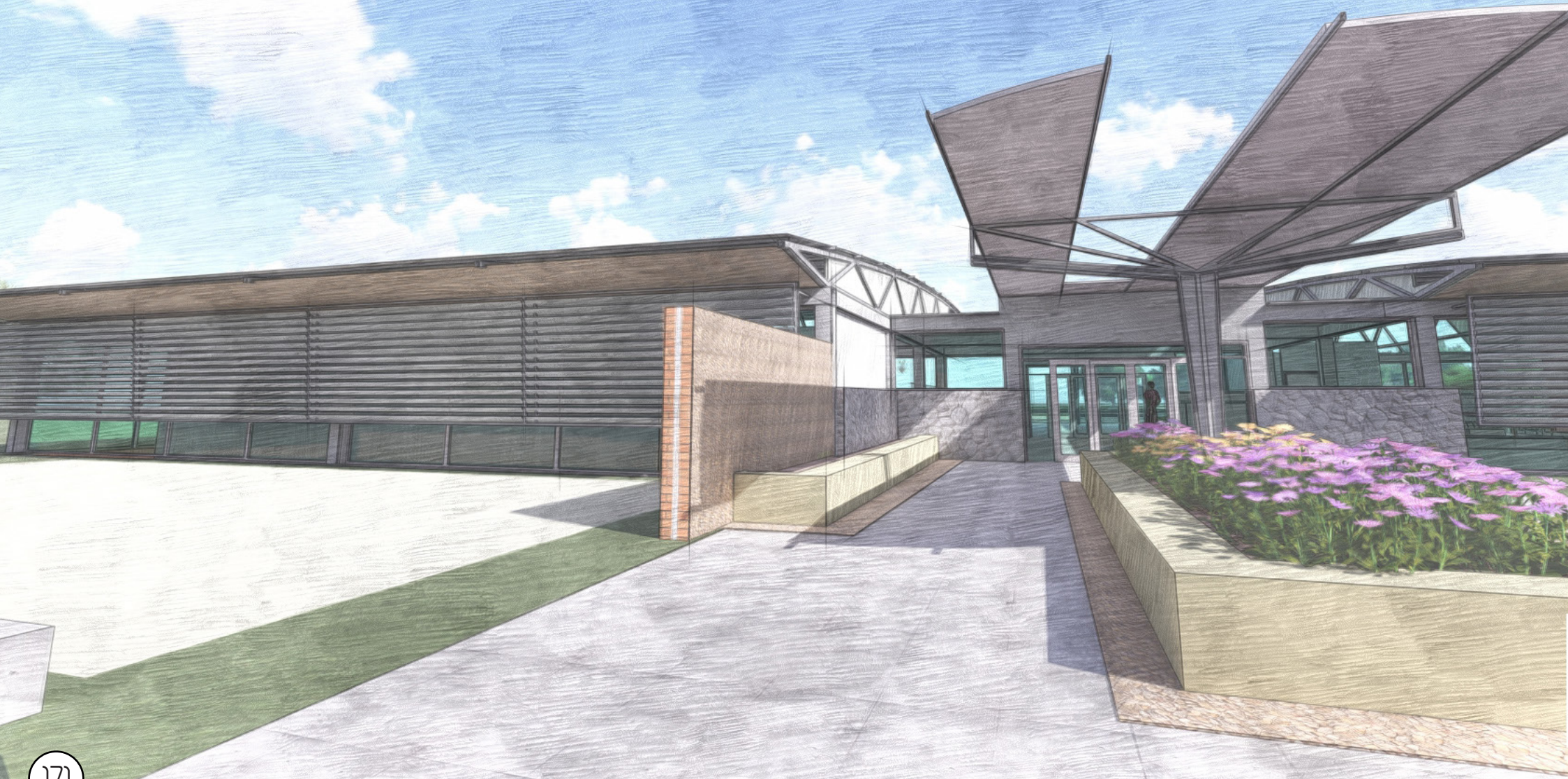
Center of
meditation garden



Outside discussion area



Back entrance to traditional healing center



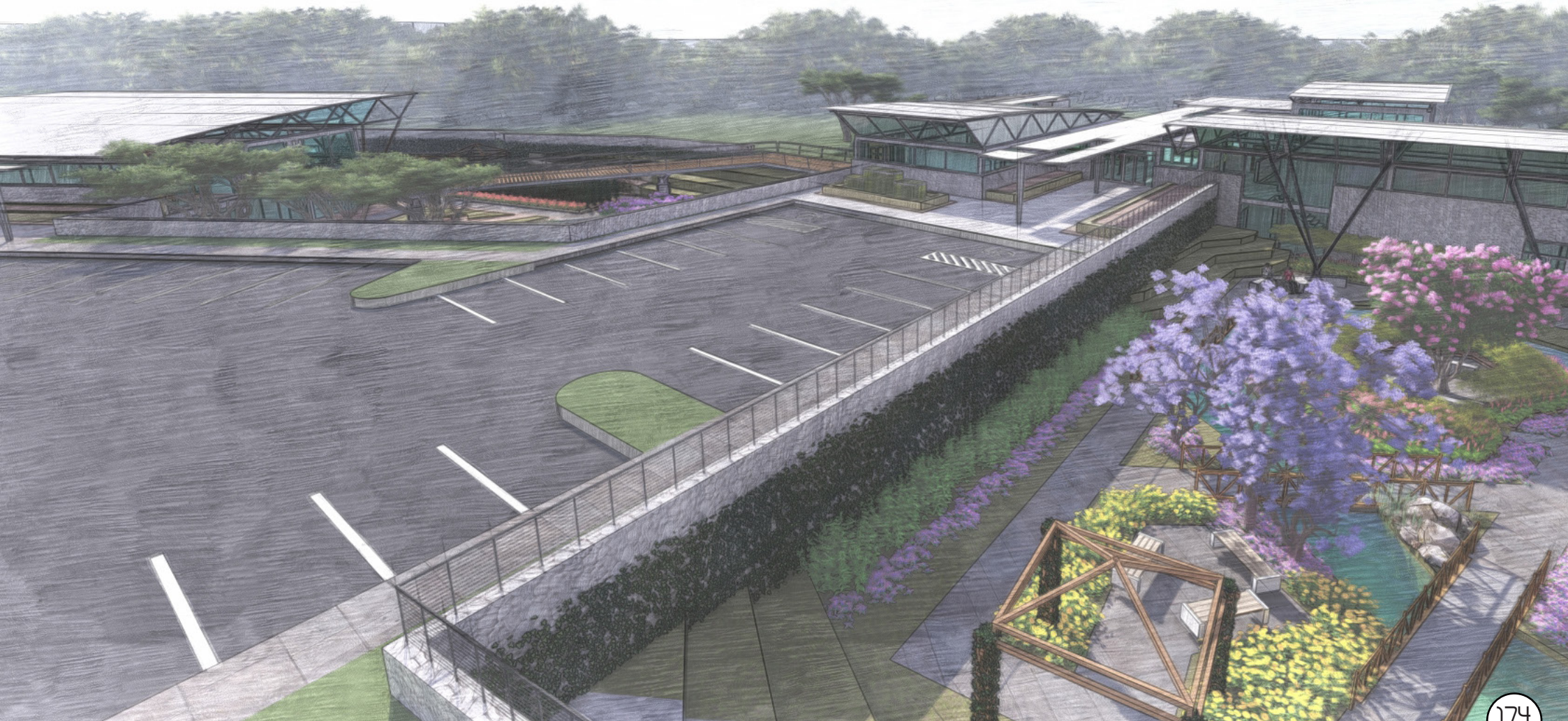
Yoga studio



Therapy consultation area



Traditional healing center parkade



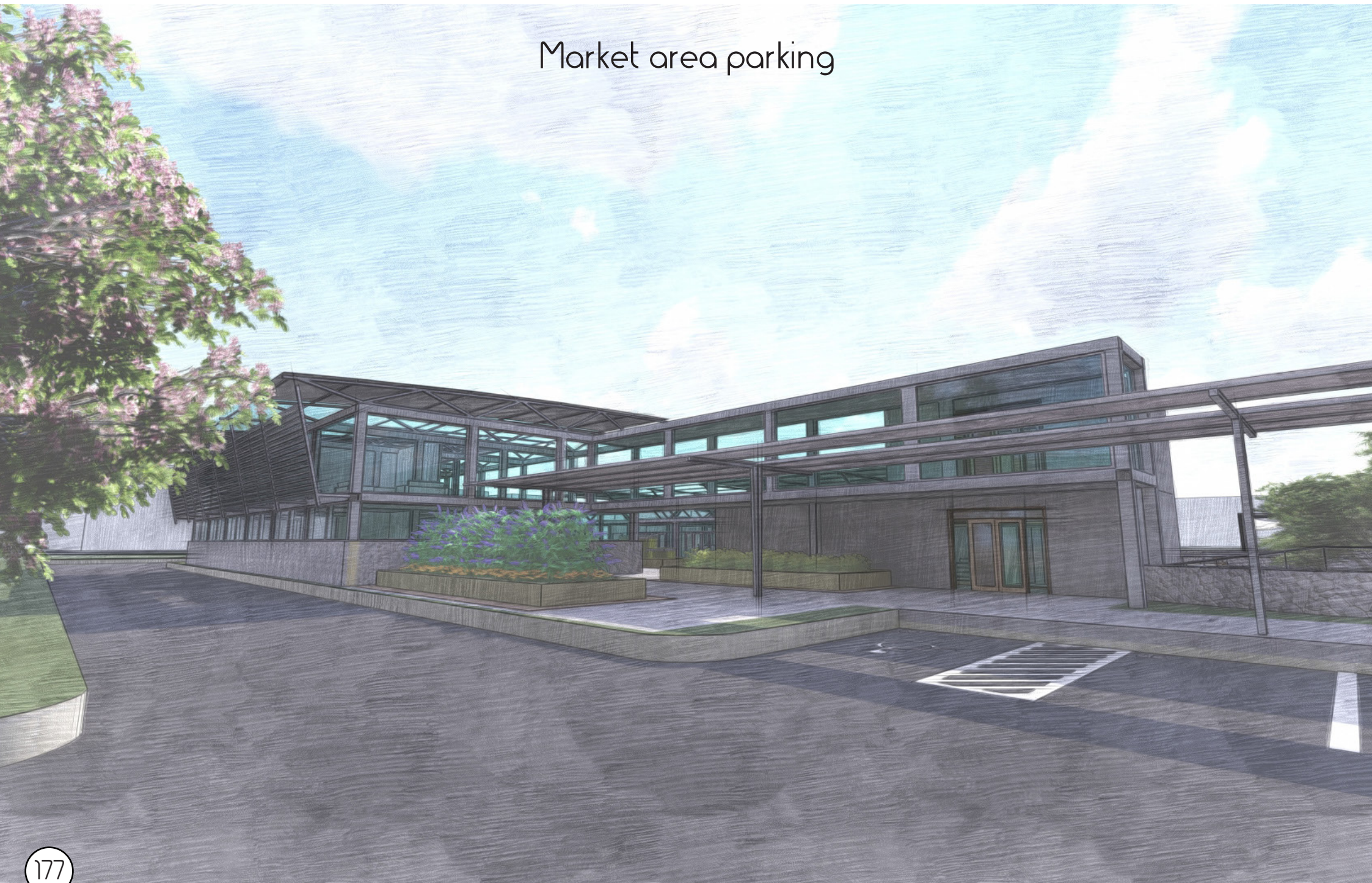
Circulation area



Market area parking



Market area parking



Suspended walkway view from market



Edible garden



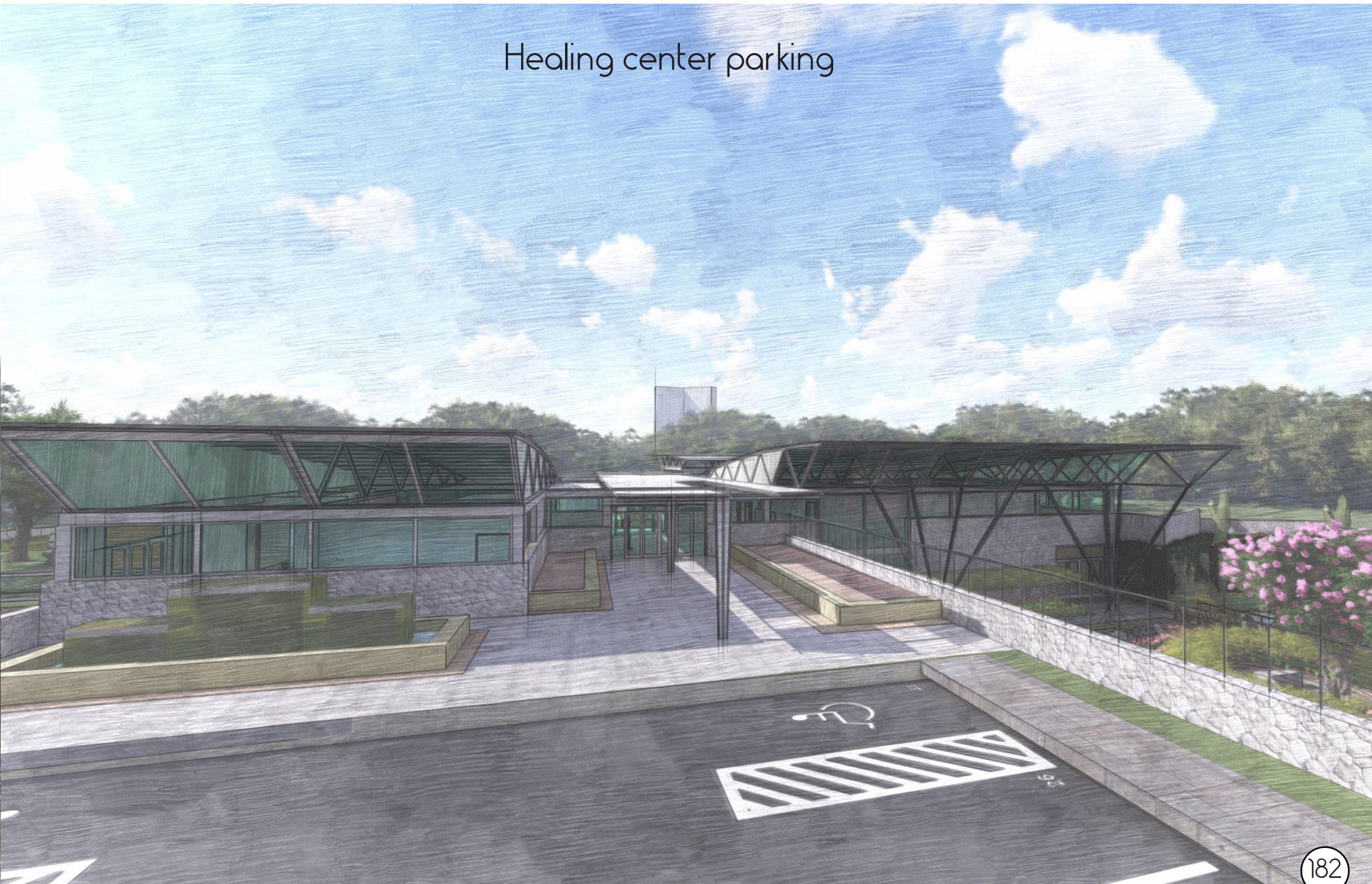
Essential garden



Herbal garden



Healing center parking



Conclusion

Architectural research and application forms the basis of forming a conclusion to the design as well as evaluating the information gathered during the process of the design.

Challenge:

King's Park, encapsulating the Bloemfontein Zoo and Rose Garden, benefits to the public of Manguang should be resurrected. This was derived from the historical research done on the site, as well as theoretical research on how green space in urban ecologies can benefit human health and well-being. The site was identified as being in a state of decay in relation to its historical significance as well as an urban green space. The architectural intervention of the site should serve as a reintroduction of the park to the surrounding city organism.

Green space is a crucial part of the urban ecology of a city. This dissertation aimed to provide this space back to the public through social justice principles, environmental ethics and public participation. The goal is to appropriate the site to the people of Manguang to revive its cultural significance as a place of care and improve public health and well-being.

The complexity and contention of the site held numerous hurdles during the design process. This proposal went through four complete re-designs before a "feasible" application was considered appropriate. Even then, the intervention seems to be an ever-expanding array of considerations and will continue to be. The final design decision might have been based more on time management limitations than on concluded problem-solution outcomes.

7.7

CONSTRUCTION DRAWINGS

HENRY STREET

PARFITT AVENUE

ERF 26408

ERF 26410

ERF 26409

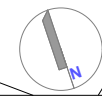
ERF 26412

ERF 26407

EXISTING PARKING

30640

KINGSWAY

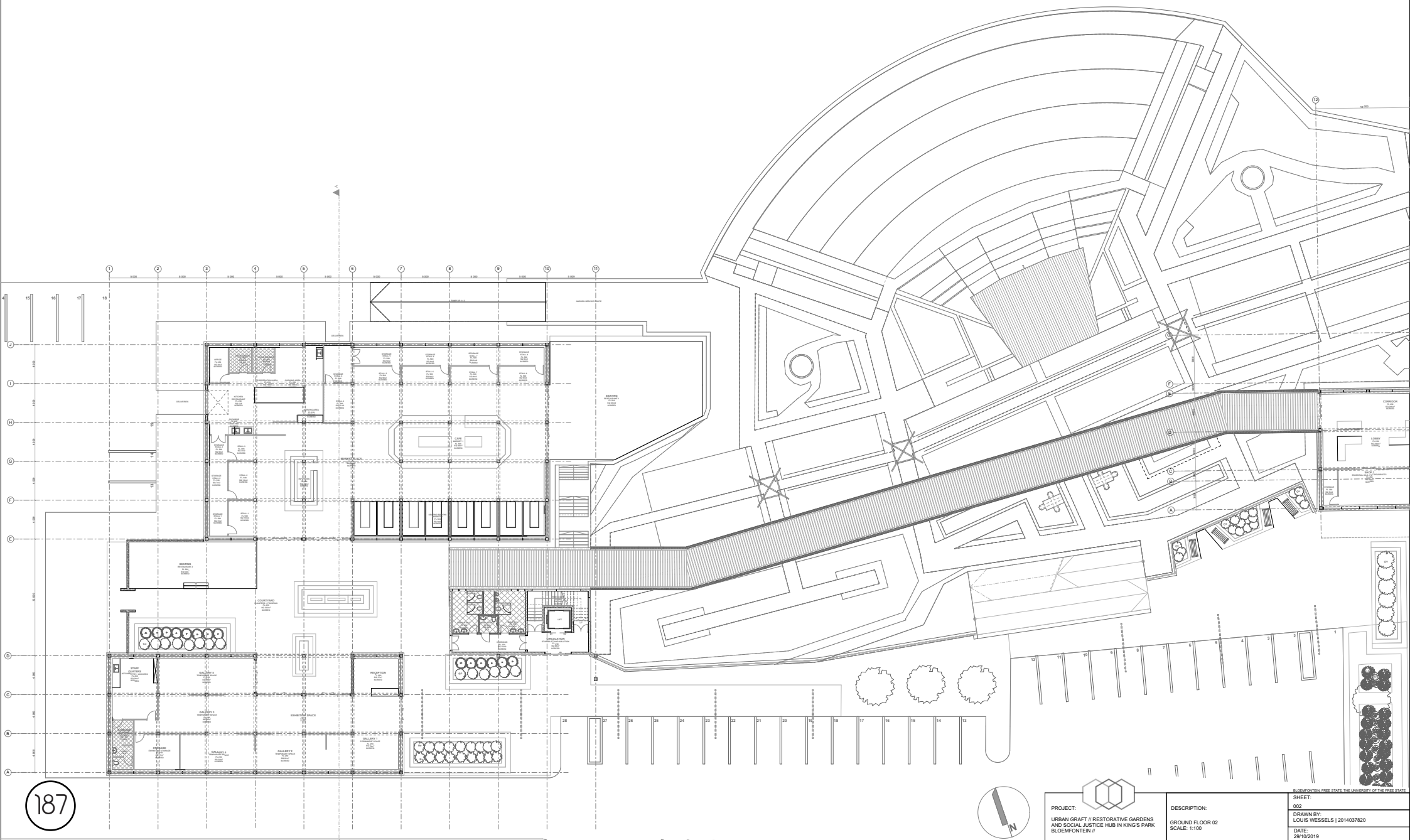


PROJECT:
URBAN GRAFT // RESTORATIVE GARDENS
AND SOCIAL JUSTICE HUB IN KING'S PARK
BLOEMFONTEIN //

DESCRIPTION:
LOCALITY PLAN
1:500

BLOEMFONTEIN, FREE STATE
SHEET:
010
DRAWN BY:
LOUIS WESSELS |
DATE:
29/10/2019

186

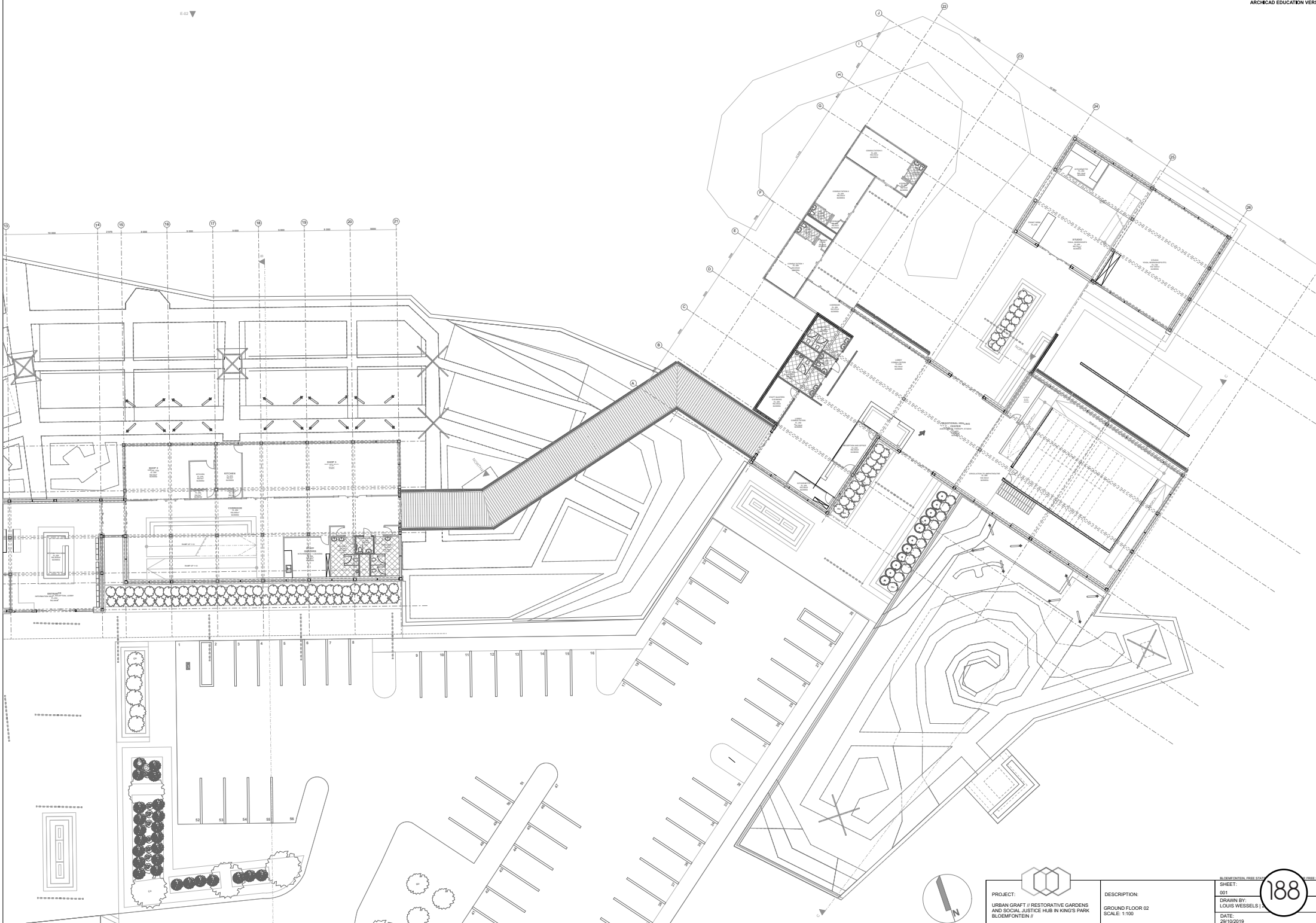



187

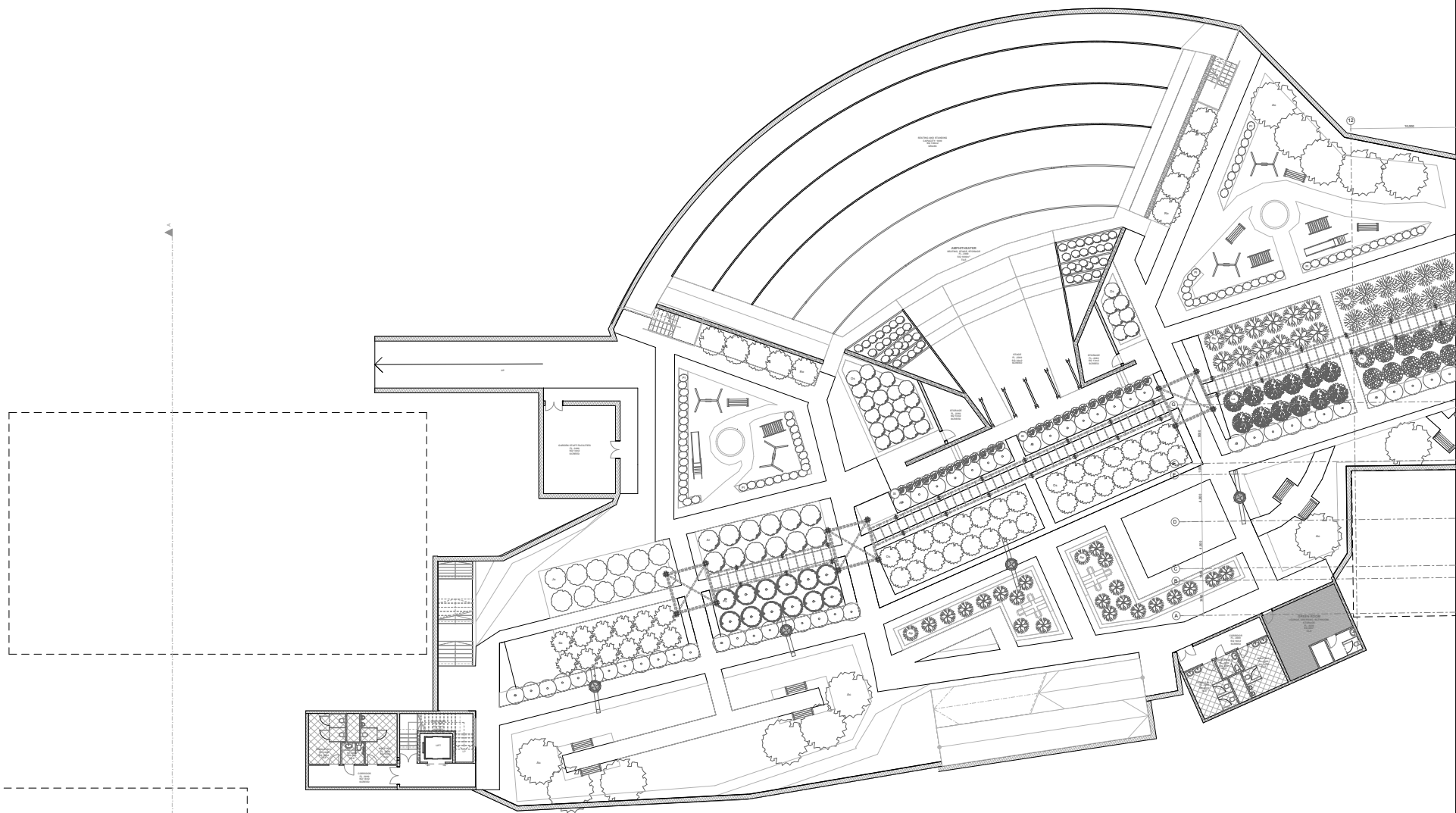


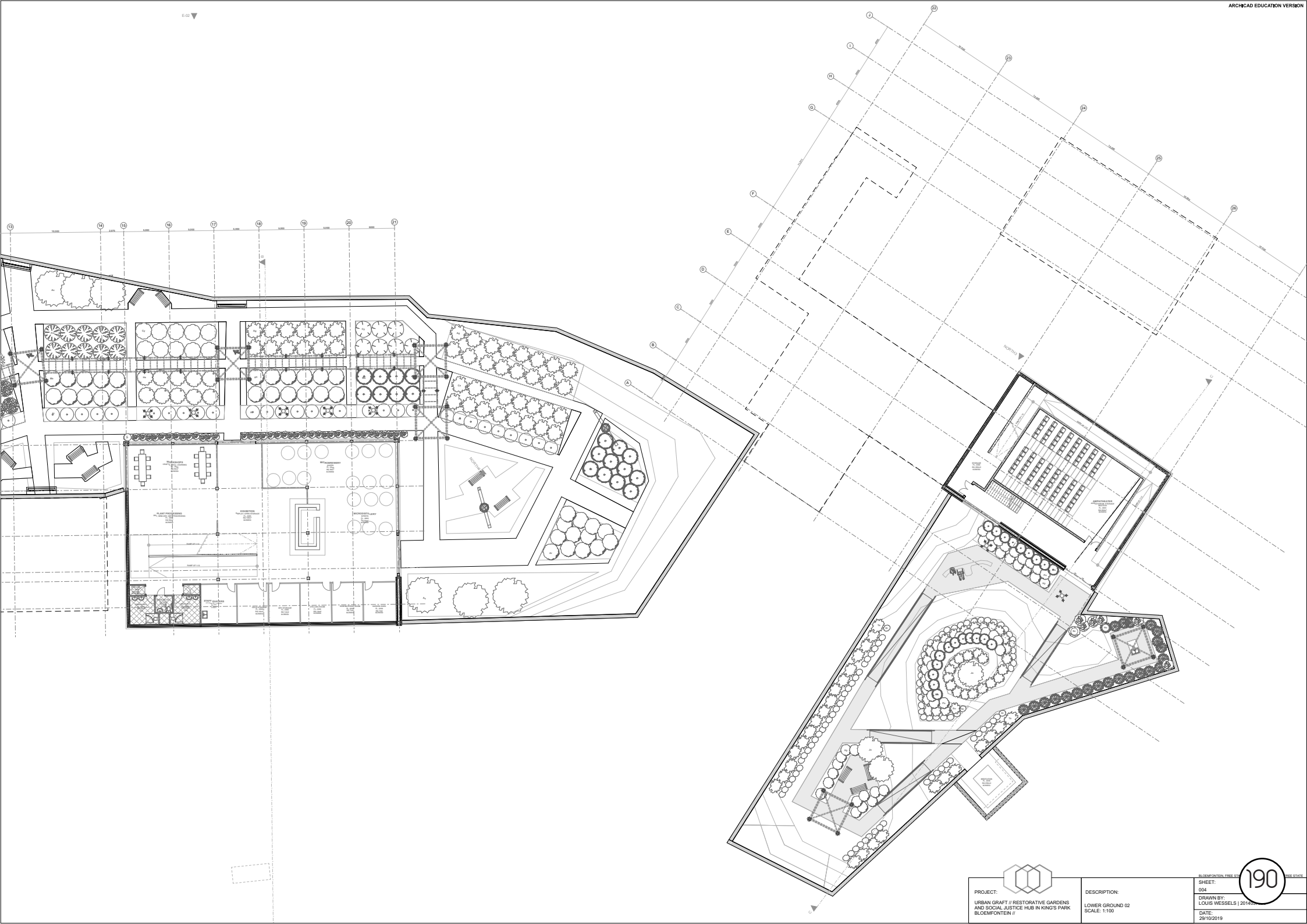
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		DRAWN BY: LOUIS VESSELS 2014037820
		DATE: 29/10/2019



BLOEMFONTEIN, FREE STATE, THE UNIVERSITY OF THE FREE STATE

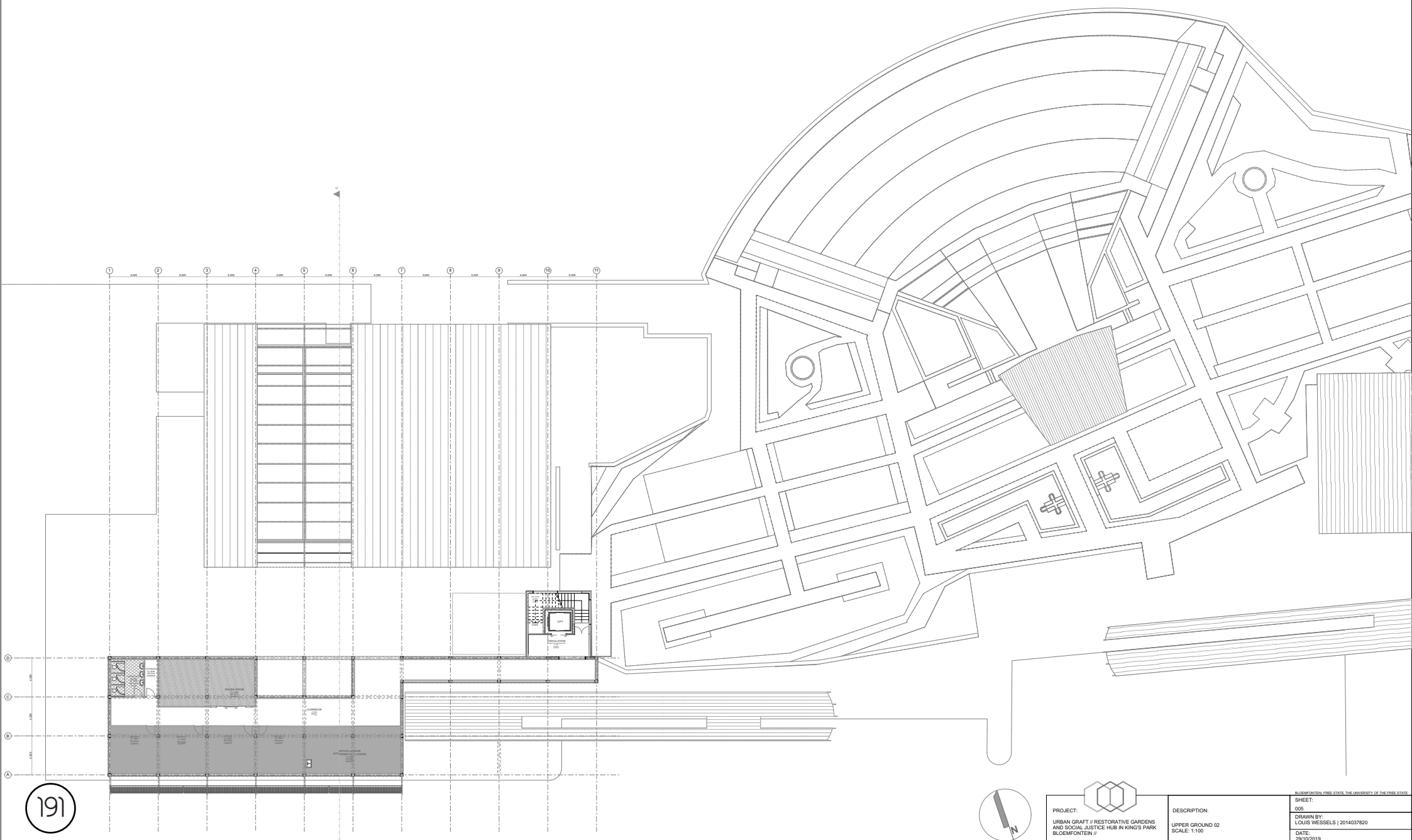


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	URBAN GRAFT // RESTORATIVE GARDENS AND SOCIAL JUSTICE HUB IN KING'S PARK	GROUND FLOOR 02	FREE STATE
	BLOOMINGTON, I	SCALE: 1:100	SHEET:
			001
		DRAWN BY:	
		LOUIS WESSELS	
		DATE:	
		28/10/2019	

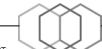




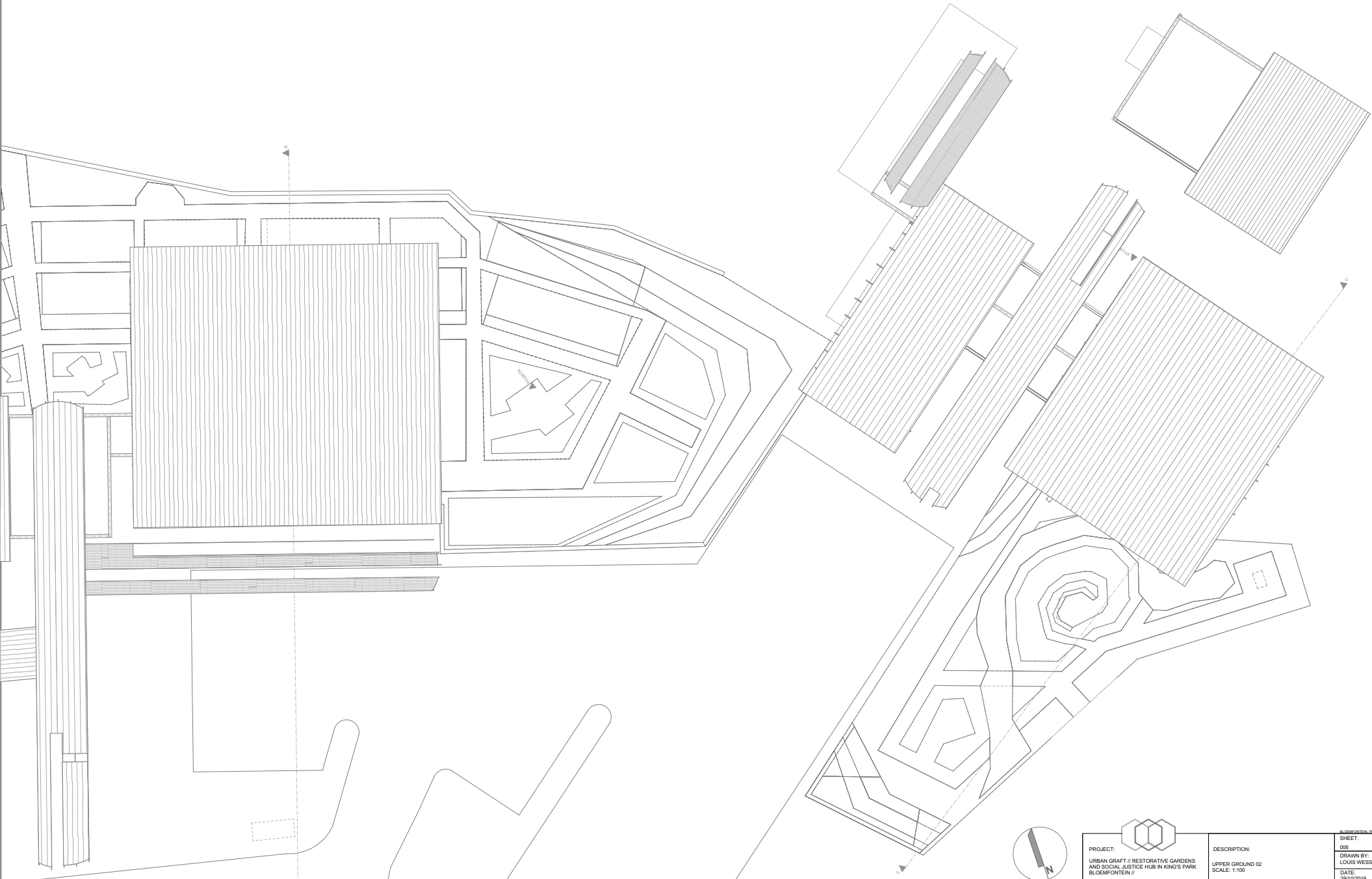
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			190
			SHEET:



191



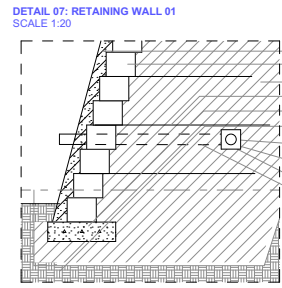
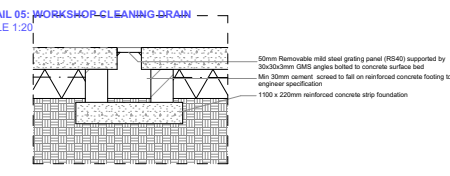
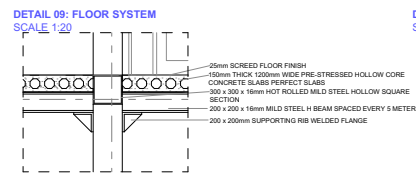
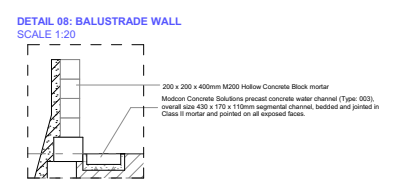
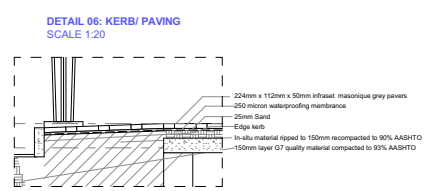
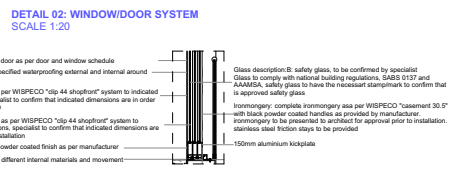
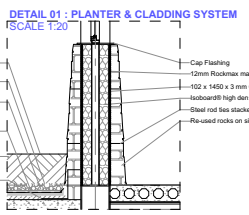
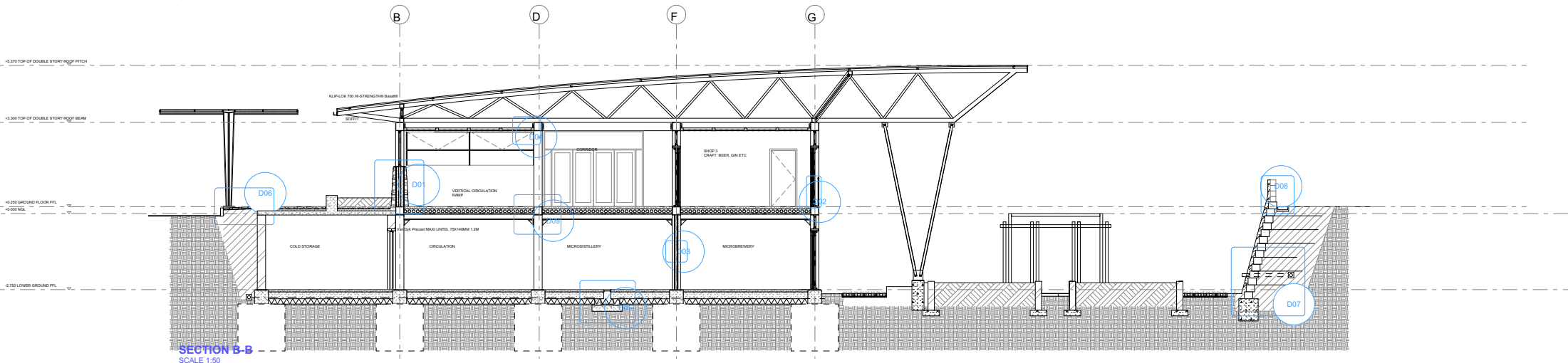
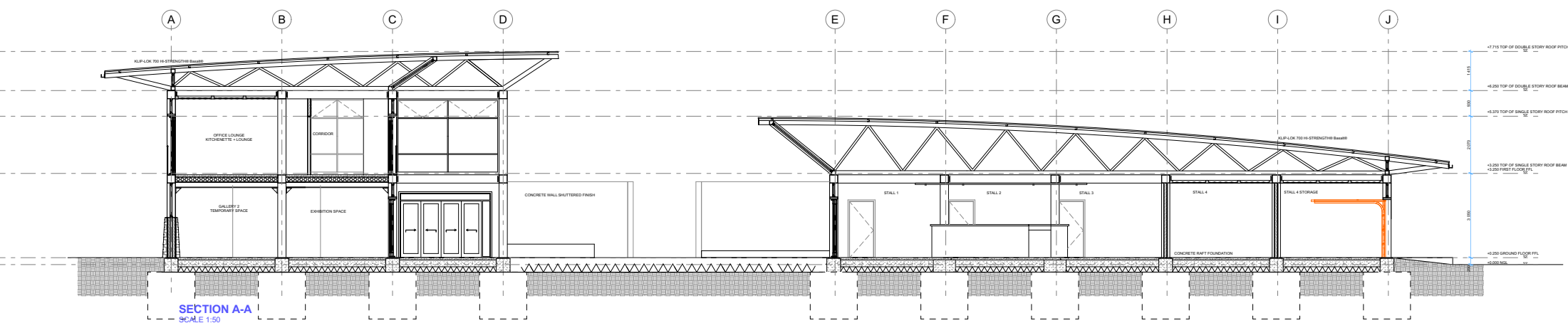
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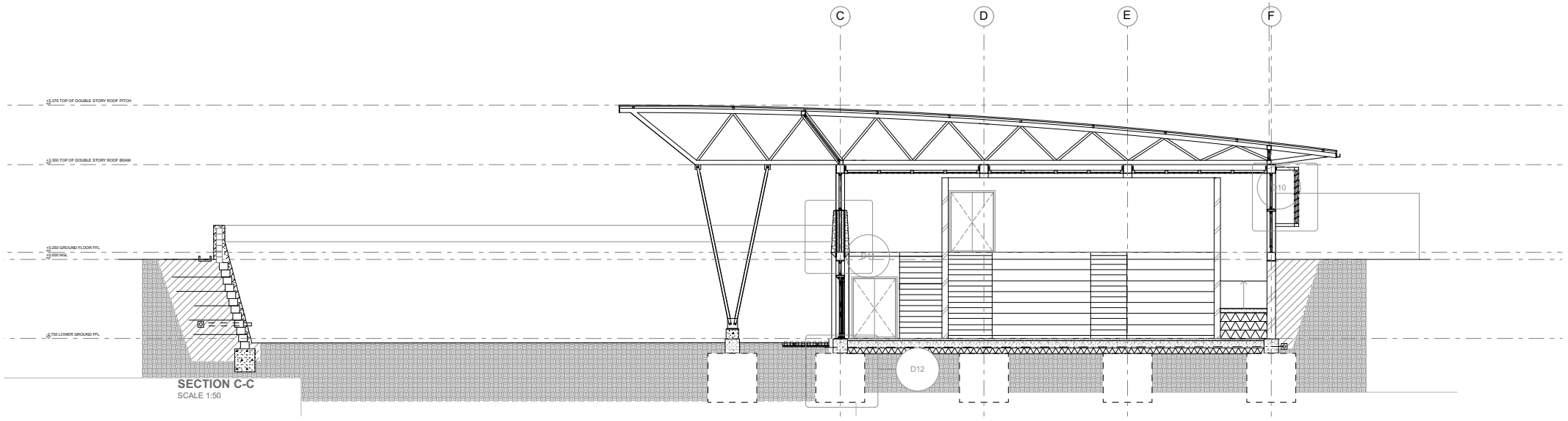


PROJECT:
 URBAN GRAFT // RESTORATIVE GARDENS
 AND SOCIAL JUSTICE HUB IN KING'S PARK
 BLOEMFONTEIN //

DESCRIPTION:
 UPPER GROUND 02
 SCALE: 1:100

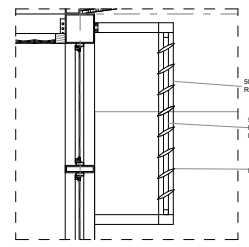
SHEET:
 008
 DRAWN BY:
 LOUIS WESSELS |
 DATE:
 28/10/2019





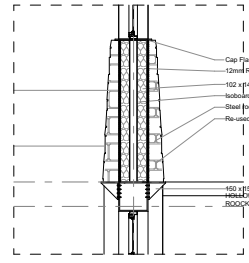
SECTION C-C
SCALE 1:50

DETAIL 10: LOUVRES
SCALE 1:20



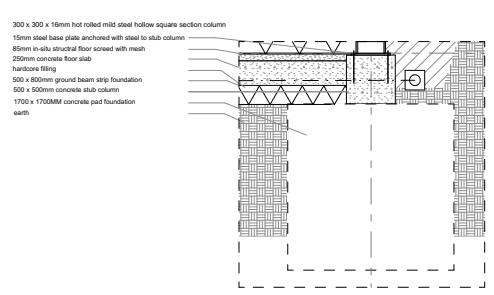
- 30x50mm HOLLOW SQUARE LIGHTWEIGHT STEEL COLUMN, COLD FORMED, TWO COATS RED OXIDE ENAMEL OIL BASED FINISH, WELDED TO 300x200mm LIGHTWEIGHT STEEL SQUARE BEAM
- 50x50mm HOLLOW SQUARE LIGHTWEIGHT STEEL BEAM, COLD FORMED, TWO COATS RED OXIDE ENAMEL OIL BASED FINISH, WELDED TO 150x150mm LIGHTWEIGHT STEEL I BEAM
- HOLLOW SHADE SHUTTER, STAT

DETAIL 11: CLADDING SYSTEM
SCALE 1:20

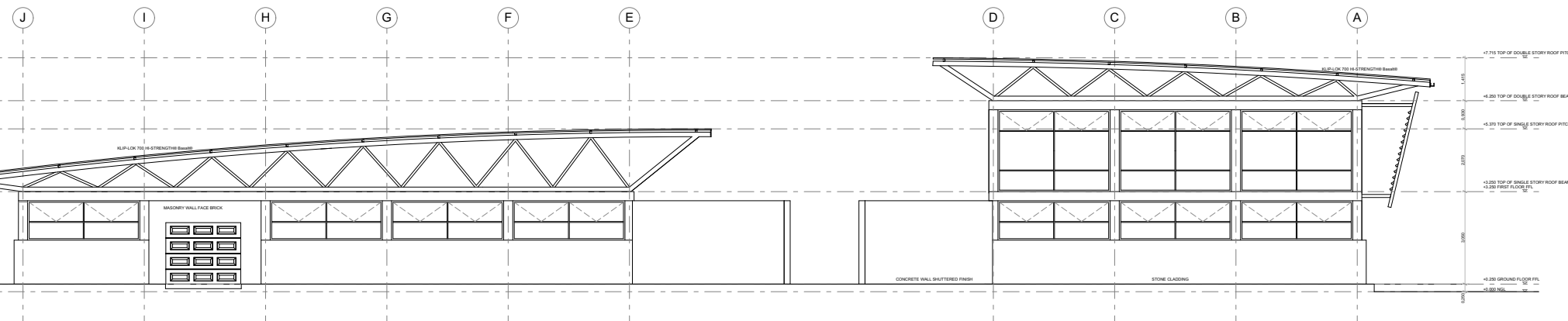


- Cap Flashing
- 12mm Rockmax magboard fireproof mgo board
- 102 x 450 x 3 mm Galvanized Mild Steel Stud DW598270
- rockwool high density 23.0kg/m3 insulation 100mm
- Steel joist ties stacked rocks to steel stud and magboard
- Re-used rocks on site mortar stacked upon each other
- 150 x 150mm SUPPORTING RIB WELDED AND BOLTED FLANGE TO HOLLOW SQUARE STEEL SECTION SUPPORTING MORTAR BLOCK STACK

DETAIL 11: FOUNDATION SYSTEM
SCALE 1:20



- 300 x 300 x 16mm hot rolled mild steel hollow square section column
- 15mm steel base plate anchored with steel to stub column
- 85mm insula structural floor screed with mesh
- 250mm concrete floor slab
- harcore filling
- 500 x 800mm ground beam strip foundation
- 500 x 500mm concrete stub column
- 1700 x 1700MM concrete pad foundation earth



WEST ELEVATION
SCALE 1:50

<p>PROJECT: URBAN GRAFT // RESTORATIVE GARDENS AND SOCIAL JUSTICE HUB IN KING'S PARK BLOEMFONTEIN /</p>	<p>DESCRIPTION: SECTIONS & DETAILS 02 SCALE: 1:50 & 1:20</p>	<p>DISCIPLINE: 194</p>
		<p>SHEET: 008</p>
		<p>DRAWN BY: LOUIS WESSELS</p>
		<p>DATE: 28/10/2019</p>

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