

LAND OF THE SCATTERED SEEDS

nature, memory and silence

natasha laurent, 2014

Submitted in partial fulfilment of the requirements for the degree of Master in Architecture (Professional) in the Faculty of Engineering, Built in Environment and Information technology, University of Pretoria.

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LAND OF THE SCATTERED SEEDS

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University of Pretoria
2014

No. 2 mining shaft compound, Cullinan

Heritage and Cultural Landscapes

25°40'53"S 28°30'51"E

Study leader: Nico Botes

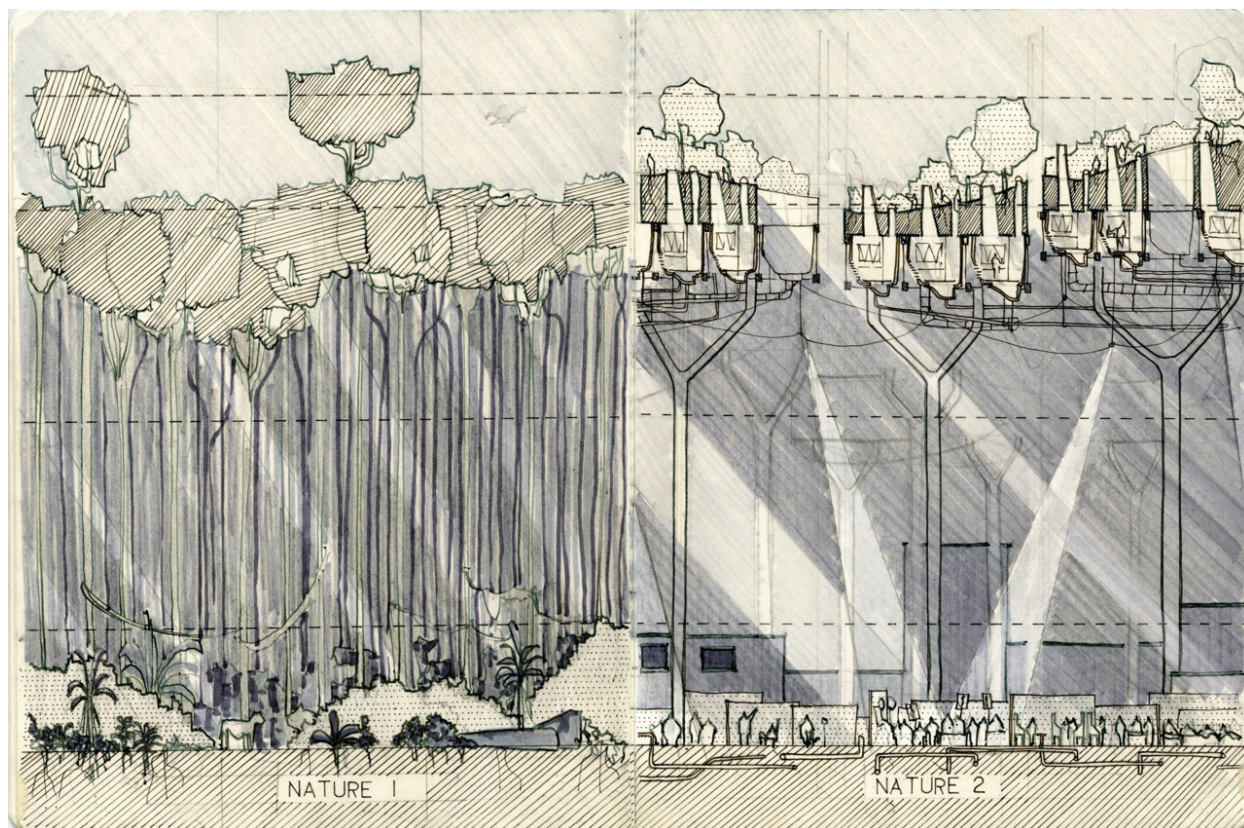
Studio leader: Dr Arthur Barker

For my dearest parents and siblings, with love

*And how to stop the rot?
How to salvage something from time's passage?
How long before the map makers decide to
erase this structure completely?
Before it becomes a nameless ruin?
And then a mere pile of stones?
Mossed over.
Forgotten.*

*How long before they lift its name from
their charts and from our collective memory?
The only thing I can do is fill the place with
music.”*

Richard Skelton (s.a)



Suid Afrika se skandalige historiese arbeidsbeleidsrigtings, veral dié vir trekarbeiders, het 'n sosio-ekonomiese klad op ontelbare families gelaat.

Kunstenars en digters is deur die eeue bekoor deur ruïnes in tuinlandskappe, maar die verlate kampongkompleks naby Cullinan se diamantmyn het die outeur ontnugter vanweë die romantisering van die vervalle kampong - die anestesie moet iewers einde kry.

Die natuur en tydsverloop het 'n uitwerking gehad op dié mynkampong en het toegelaat dat groot grepe van die beboude landskap verdwyn uit die openbare geheue (gedeeltelik ook as gevolg van die terrein se inherente isolasie en die ontoeganklikheid daarvan vir die publiek). Natuurlike prosesse het onverpoosd hul verloop geneem. Onvermydelik moet gevra moet word op watter tydstip menslike ingryping noodsaaklik word en wanneer die natuurlike proses van verval omgekeer moet word, veral wanneer dit 'n invloed het op ons tasbare erfenis? In Skelton se gedig stel hy voor dat die plek met musiek gevul word. Hierdie verhandeling ondersoek die tenoorgestelde, naamlik om die plek met stilte te vul ten einde die kroniek van ellende en onreg in die lewe van soveel van ons voorgangers bloot te lê.

Die voorgestelde ingryping op die terrein manifesteer as 'n ontmoetingspunt tussen natuur en geheue, inherent tot die terrein, en laat toe vir bemiddeling tussen genesing, aanpasbare hergebruik en herdenking. 'n Dialoog moet geskep word wat onderskei tussen ruïne en die nuwe toestand, asook die verhouding tussen die aard van die Hoëveldlandskap en die voorgestelde nuwe plantegroei wat beide vir gebruik en navorsingdoeleindes beoog word.

ABSTRACT

South Africa's shameful migrant labor policies of the past have left a socio-economic mark on the families of millions.

The ruin in the garden has long been a fascination of many artists and poets, but in the case of an abandoned compound complex alongside Cullinan's diamond mine, the author is left unsettled with the thought of the romanticisation of the compound falling to ruins. The anesthesia has to stop at some point.

Nature and time have acted upon the compound and has allowed for a large amount to be erased from the public's greater memories, (partly due to its inherent isolation and its inaccessibility to the public). Nature is only doing what it knows best - to carry on and heal. The convoluted question needs to be asked, when does it become necessary for human influence to occur and stop a natural process of decay, especially in question of preserving tangible heritage? In Skelton's poem, it is suggested that the place is 'filled with music'. This dissertation will attempt the opposite; to fill a place with silences so as to expose and reveal the narrative of the hardships endured to the lives of so many before us.

The proposed intervention manifests as a meeting point between nature and the memory embedded in the site, and allows for mediation between healing, adaptive reuse and memorialization. A dialogue must be formed between what is ruin, the new condition and its relation to the wild nature of the Highveld as well as the new introduced vegetation for consumption and research.

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PROLOGUE

Exploration comes to pass within the context of an abandoned mining compound, close to the large open pit in Cullinan, an epicenter of the years of abuse to both the land and the individuals that inhabited it. Over the past four decades, nature has acted upon these buildings as an anaesthetic, leaving the compound as a collective of lone-standing stone arches, roofless quarters and outdoor cooking areas. The fascination with ruins, and their ability to ignite romantic impressions, has meant that memory of the gravity of oppression that must have occurred within the compound is diminished. The nature that thrives presently at the compound has the ability to heal, but will eventually consume and erase memory, if intervention does not occur.

This dissertation explores how nature can be incorporated into an architecture that will allow a platform of silence in order for the scarred landscape of Cullinan to speak.

“Of all the healing forces in the God-given world around us, silence is perhaps the greatest” (Day 2004:203).

The site is analysed within the broader context of the diamond mine, which is being decommissioned, and the scene is set within the wondrous and resilient landscape of the Highveld. Nature is employed as a method of understanding the context in its complexity, and is thus divided into 3 entities (Nature 1, 2 and 3). Through an investigation into the user’s phenomenological experience, both past and present, it is hoped that the new architecture will achieve a level of silence and connection with place.

The 21st century provides a new backdrop for Cullinan. Plants do not have the complexity of memory that a person has - in this they present the perfect tabula rasa, and most often, the hardier variety have the ability to grow and adapt in almost all circumstances. Along with the healing properties of a plant, they provide nourishment; eating and the preparation of food has had a strong presence within the confines of the compound and was a form of escape and camaraderie amongst the miners in what were otherwise harsh conditions. The structures used in the preparation of food production still stand today in overgrown courtyards, the importance of which requires revelation to a larger public. The programme will comprise of an arrival hall and exhibition space, green houses inserted into existing compound structures, a herbarium and plant research facility and a restaurant that makes use of produce grown on site.

MANIFESTO

Architecture does not stop at the entrance to the building; it is its meeting with the soil on which it finds itself and with the sky that it reaches out to. The romance that architecture has with nature is enduring and fascinating.

A concept of reciprocity, a mimicry
Architecture must loop itself into the system that has existed since the beginning of time. Nature creates similarities, it has a tendency to repeat patterns, and the architect must find the best way to echo these: or, to stand opposed to them in order to emphasise their quality. It is intuitive; and when it feels right - you'll know.

Architecture always negotiates a terrain between its defining utility and expression, the frisson of some excess, including the excessive linkage of the two. But what more should a building say?

A structure in the landscape, like a frame or a concrete acoustic mirror, can help to mediate between ourselves and nature simply by standing in between. Creating a very personal resonance. Like a magic key that unlocks our memories, reminding us that we are part of it all and not separate from nature.

(James 2013:117)

CHAPTER

An Introduction

ONE

Well, I stand up next to a mountain,

and I chop it down with the edge of my hand.

Well I pick up all the pieces and make an island,

might even make a little sand.

-Jimi Hendrix, 'Voodoo Child' (1968)

SHAKE YOURSELF FROM SLEEP

Nature 1, 2 and 3 - An Introduction

In *De natura deorum* Cicero writes, “[w]e sow corn, we plant trees, we fertilize the soil by irrigation, we dam the rivers and direct them where we want. In short, by means of our hands we try to create as it were a second nature within the natural world” (Cicero cited in Hunt:1993). ‘First nature’ - wilderness - is the realm of the gods, but it also provides the raw material for second nature. Second nature may be referred to as the built environment: the nature, which is created by humans for their own experience.

Later, in his book *Greater Perfections: The practice of Garden Theory*, in the chapter *The Idea of the Garden* (1993:325), John Dixon Hunt refers to gardens as the “third nature,” a self-conscious representation of first and second natures, an artful interpretation” of a specific place ... for specific people.”







Figure 1.1. (opposite) Photograph of compound from the opposite side of the hole. Note how close the compound sits and the magnitude of the hole (Cullinan archives, 2014)

Figure 1.2. (Right) Diagram of tension created as a result of the open pit (2014)



What if Eden is still in fact around us? What if we never left it after all, the only difference being that God withdrew from the picture, leaving us alone with our own discontents? In that case we can either, in God's absence, keep the garden or destroy it.- Robert Poque Harrison, Gardens: An essay on the human condition, 2008

Nature 1, as the great sovereign healer, places bandages over all and will, with time, conceal all that has occurred on this earth. The first nature achieves this by consuming and digesting, until, through this process new life is conceived. Nature 1 can be regarded as the original tabula rasa, or what first existed on earth before man settled; it is a state of being which the self-healing potential of landscape attempts to re-instate, a return from the new nature, that of Nature 2.

The abandoned mining compound at Cullinan exists as a vessel for the events and stories of the many thousands of men that inhabited the compound once before. In Juhani Pallasmaa's essay, Space, place and imagination: The temporal dimension of existential space, he describes that (2009:18),

Built structures, as well as mere remembered architectural images and metaphors, serve as significant memory devices in three different ways: first, they materialise and preserve the course of time and make it visible; second, they concretise remembrance by containing and projecting memories: and third, they stimulate and inspire us to reminisce and imagine.

Figure 1.3. Photograph of existing compound foundations in the foreground, with fauna growing through, and abandoned No. 2 mine shaft (Cullinan archives, 2014)



Man vs. Machine vs. Nature - Urban condition and intention

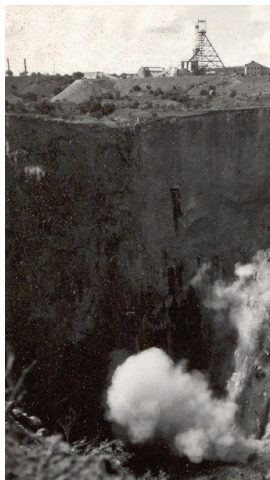
Cullinan is experiencing a definite and somewhat uneasy tension between the three depictions of man, machine and nature. The diamond mine is as a result of a fruitful Kimberlite pipe (igneous rock best known for sometimes containing diamonds) and the town exists subsequently as a result thereof. The relationship between, and the co-existence of, above and below surfaces, man and machine, the enclosed and the open is 'patched' by nature, if not now then possibly decades or centuries later. It may be that the guide to subverting the machine lies within the realm of Nature 1. In Ando's words (1991:75) "[h]uman life is not intended to oppose nature and endeavour to control it, but rather to draw nature into an intimate association in order to find union with it".

There is no doubt that Cullinan's landscape has been exploited by humans in order to serve their own ends, but in addition to this there was the human exploitation of the many miners who were oppressed by their employers and a system which is now past. As a place of abode for the miners, the compound has the 'trappings' associated with human occupancy, however it is clear from observing this place that they were viewed merely as 'cogs' in the 'machine'.

To the west of the R512 from Pretoria, as the town of Cullinan approaches and one is introduced to the road signs indicating the area to be 'diamond rich', a discreet dirt road leads to the first and now abandoned miners compound of the original Premier diamond mine. Built in 1903, the enclosed compound housed up to 15000 African miners in the mine's hey day: today it carries with it a story of repression and domination. The miners were relocated in 1973 (Lincoln:2014) and most of the present day miners now stay with their families in the township of Refilwe, which lies to the north of Cullinan's enormous silt dam. The compound has therefore remained stagnant and in various degrees of ruination for the past 41 years.

Thick, tall grasses grow abundantly around the massive stone and masonry structures and they poke through any remaining cracks in the concrete floor slabs; so much so, that there are many warning notices which caution the curious to stay away and to be vigilant of snakes. Currently, the complex is owned by Petra Mines, who purchased the mine in 2008 from De Beers; as it is under strict supervision, it is inaccessible to the general public. It is rumoured that both mining companies, De Beers and Petra, wish to conceal the negative history associated with the compound as it's revelation would likely bring with it damaging publicity: the stories of the compound are for the moment concealed from public knowledge (Conversation with John Lincoln:2014).

Figure 1.4. Photograph of gatekeeper at the Premier mine (Cullinan archives, 2014)



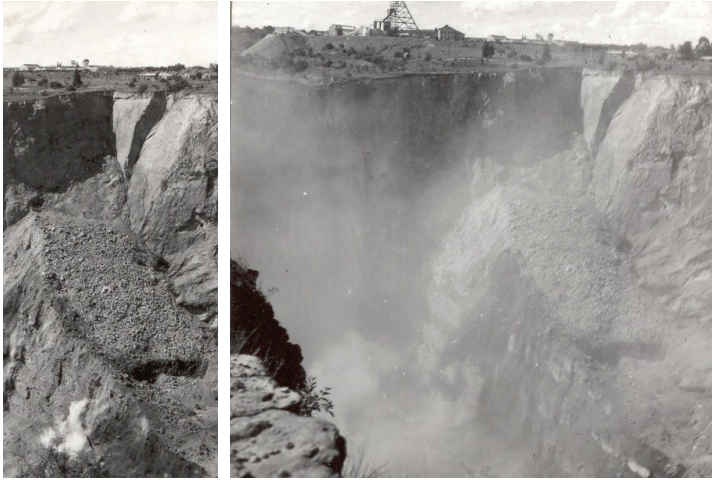


Figure 1.5. Series of photos taken during a blast at Cullinan's open pit (Cullinan archives, 2014)

The significance of this compound in addition to the knowledge that Cullinan was built on the 'backs' of the men who stayed there, holds potential for healing and commemoration. Although romantic in its current state of ruination, having been once again 'reclaimed by nature', the memory associated with the walls and foundations that stand there is undergoing a slow erosion with the passing of each new day. Most of the miners from this era have retired and few are still alive; there is little oral history that still exists and what does has not been told. Much as the 'machine' would like these stories, which detail the exploitation of these men to vanish - they have enormous value for a context of healing which requires that the true story of the diamond mine be revealed.

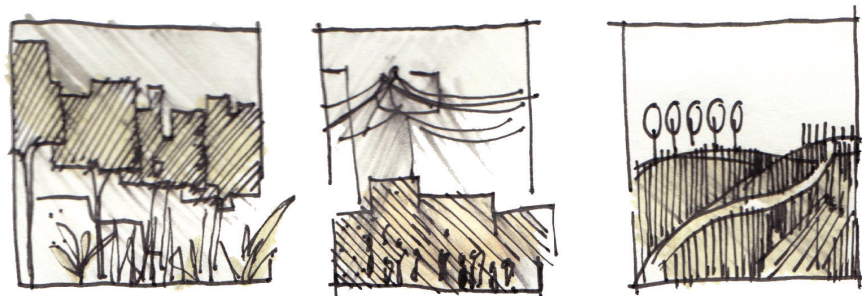


Figure 1.6. Nature 1, 2 and 3 (Author 2014)

Nature and Memory- Theoretical Intention

This dissertation will look at the very nature of nature and the nature of memory. These different 'natures' will provide a lens to inform the methods of analysing the site in terms of its physical and historical contexts.

Nature both nurtures and consumes; it exerts authority over all while holding a mirror to society. As described by Kant, nature is both sublime, in the sense of it being perfect, but also grotesque. Werner Herzog, when making Fitzcarraldo (1982), commented on the jungle:

It's not so much erotic, but full of obscenity. Nature here is vile and base. I see fornication and asphyxiation and choking, fighting for survival and growing and just rotting away ... It's not that I hate it. I love it. I love it very much. But I love it against my better judgment (Herzog as cited by Spirn, 1997).

To Frank Lloyd Wright, nature was the manifestation of God: "*Nature should be spelled with a capital 'N,' not because Nature is God but because all that we can learn of God we will learn from the body of God, which we call Nature.*" (as cited by Spirn, 1997).

Nature should not be confused with the pastoral landscape of Cullinan, which is a manifestation of nature and built environment. Nature, part verb and part noun, governs over the 'contested' landscape. The landscape of Cullinan may be thought of as a place, "a space that can be remembered, that we can imagine, hold in the mind, and consider" (Lyndon 2009:63). Lyndon goes on to say in his essay, *The place of memory*, that spaces or landscapes "become memorable in two ways: through formal structures with special coherence or power, and through events that take place rooted in a location - events that happen with such intensity, or are so frequently repeated, that they lend vividness to what surrounds them and invoke our memories of that place."

Nature will be sub-divided and classified according to the classical Roman philosopher, Marcus Tullius Cicero.

- Nature 1-wilderness and the purest form of nature that existed long before the compound was built and has since reestablished its presence after the site fell into ruination.
- Nature 2- the nature man has created for himself in the form of the built environment and with materials taken from Nature 1, existing currently in the compound site as ruins, foundation slabs, abandoned warehouses and the memories of man that they contain and carry with them.

2.1 CREATE NATURE 2.1

*Identify each of the natures and create A NEW architecture
that speaks with all three*

*The pragmatic and physical control over the natures and
response to context*

Nature 3, was later classified by John Dixon Hunt as “the self-conscious representation of the first and second natures”; this may include gardens, and planted crops (1993:325). It is anticipated that the integration of nature 3 will be included in the architectural intervention at the compound, in order to regulate the process of memory loss and to allow for a productive landscape to emerge.

Hypothesis

Nature and time will ensue to erase and make romantic any human memory if intervention (with recognition of sense of place) does not occur.

Aim

The dissertation will identify an architecture that will create a dialogue between all three natures, and at the same time, generate a nature that is new to the site, a Nature 2.1. This nature will endeavor to sensitize the user to the on goings of the compound once before, and will form a basis for a new era in the context of South Africa’s turbulent past.

While a new nature is produced, the significance of creating ‘silence’ within a building is explored. Palasmaa (2009:18) quotes Max Picard, the philosopher of Silence, “Nothing has changed the nature of man so much as the loss of silence”. Silence may not necessarily be the absence of noise but act as a phenomenon in itself; provisioning for degrees of silence in a building will allow the memory of the men to be heard.

Along with looking at the relationship between Nature 1, Nature 2 and Nature 3, the dissertation will explore the relationship between, and the co-existence of, ‘above’ and ‘below’ spaces. With this in mind, it will be logistically impossible to work in direct proximity with the ‘hole’ itself, but knowledge that the site and nature are in constant flux will remind that the earth to be built on is alive and well.

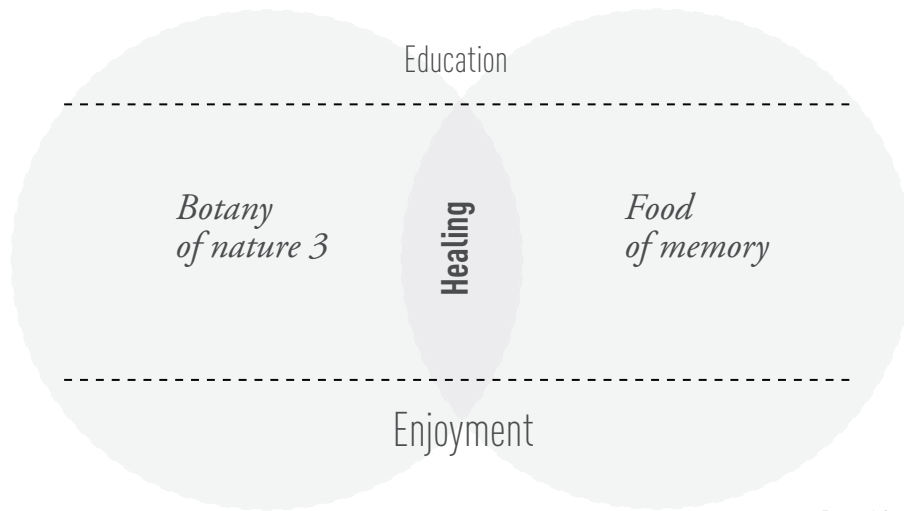


Figure 1.8. Diagram of programme (2014)

Figure 1.7. Watercolour of vegetables (2014)



The land of the scattered seeds- Programme Intention

Client: Syngenta/ Department of Agriculture and Environmental Affairs/ Slow Food International

The site is identified, through the urban vision for Cullinan; completed as a group (heron referred to as *Cullinan group*, 2014) with other Master's students of architecture (du Toit, Edwards, Laurent, Mattheus, Raubenheimer) and a Master's of landscape architecture student (van Niekerk) - as being a node for agricultural industry and possible education and research associated with agriculture. This is as it forms the culmination of an agricultural belt that wraps around the Cullinan hole and it will be a locale for smaller pilot agricultural projects. The facilities will house the manufacturing and research aspects of these projects, which include hemp and silk farming, and local fresh produce. Included in these processes, a tourist and educational interface will be incorporated so as to expose visitors to the heritage significance of the site

Within the open squares of the compound rooms, the miners would cook meals together on open fires, wash clothes and dishes, dance and sing traditional songs and also play games and chat amongst themselves when not on shift. Large concrete slabs with cooking and washing apparatus remain behind in and amongst the grass and weeds that poke through; the memory of these places of enjoyment and social engagement may be a platform and catalyst for intervention. The intervention combines gastronomic pleasure, in the form of a restaurant, with programmes that have a strong environmental aim; as a space for recreation within the scheme, the restaurant would appeal to the socially responsible who strive for biodiversity of produce, as well as fair trade.

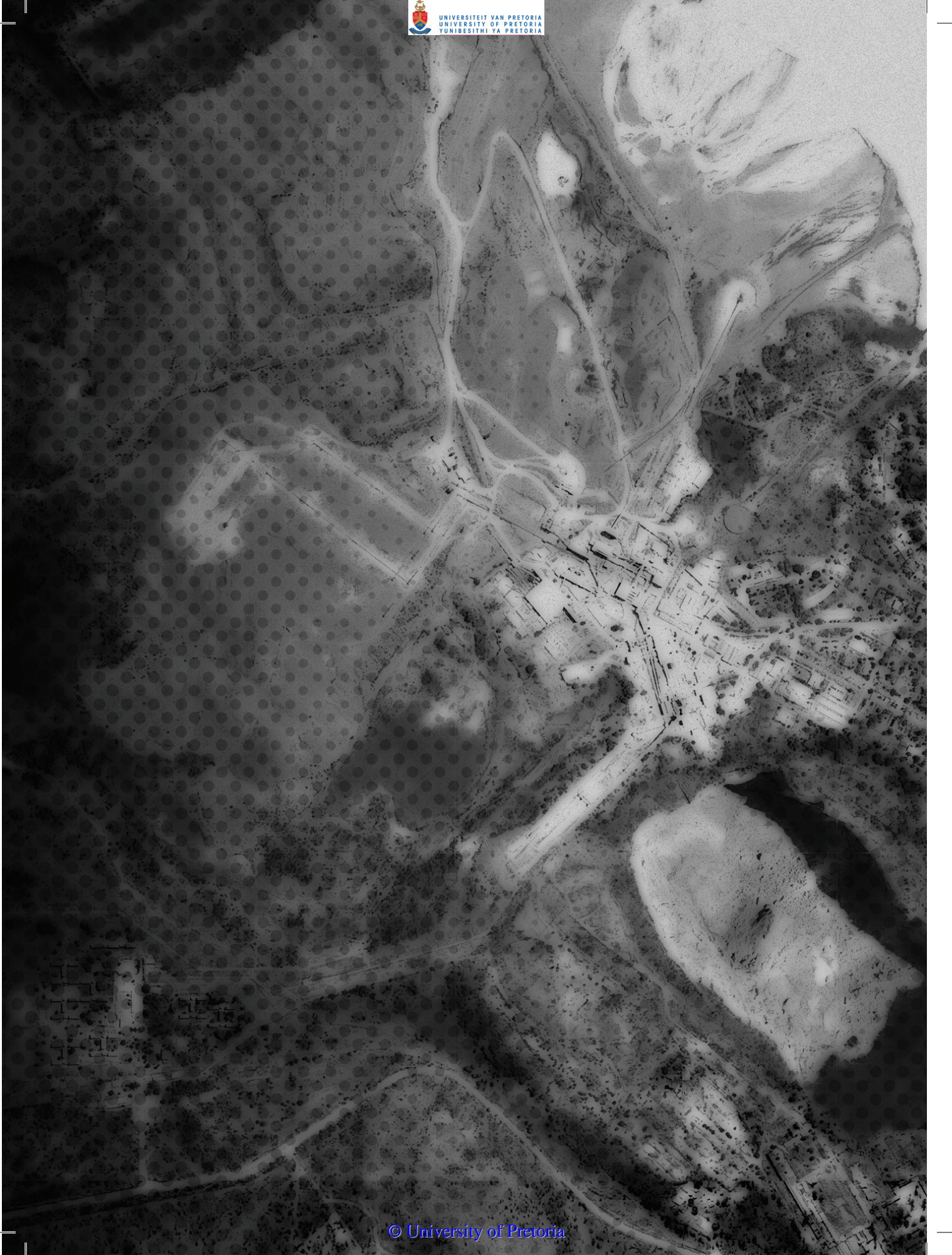
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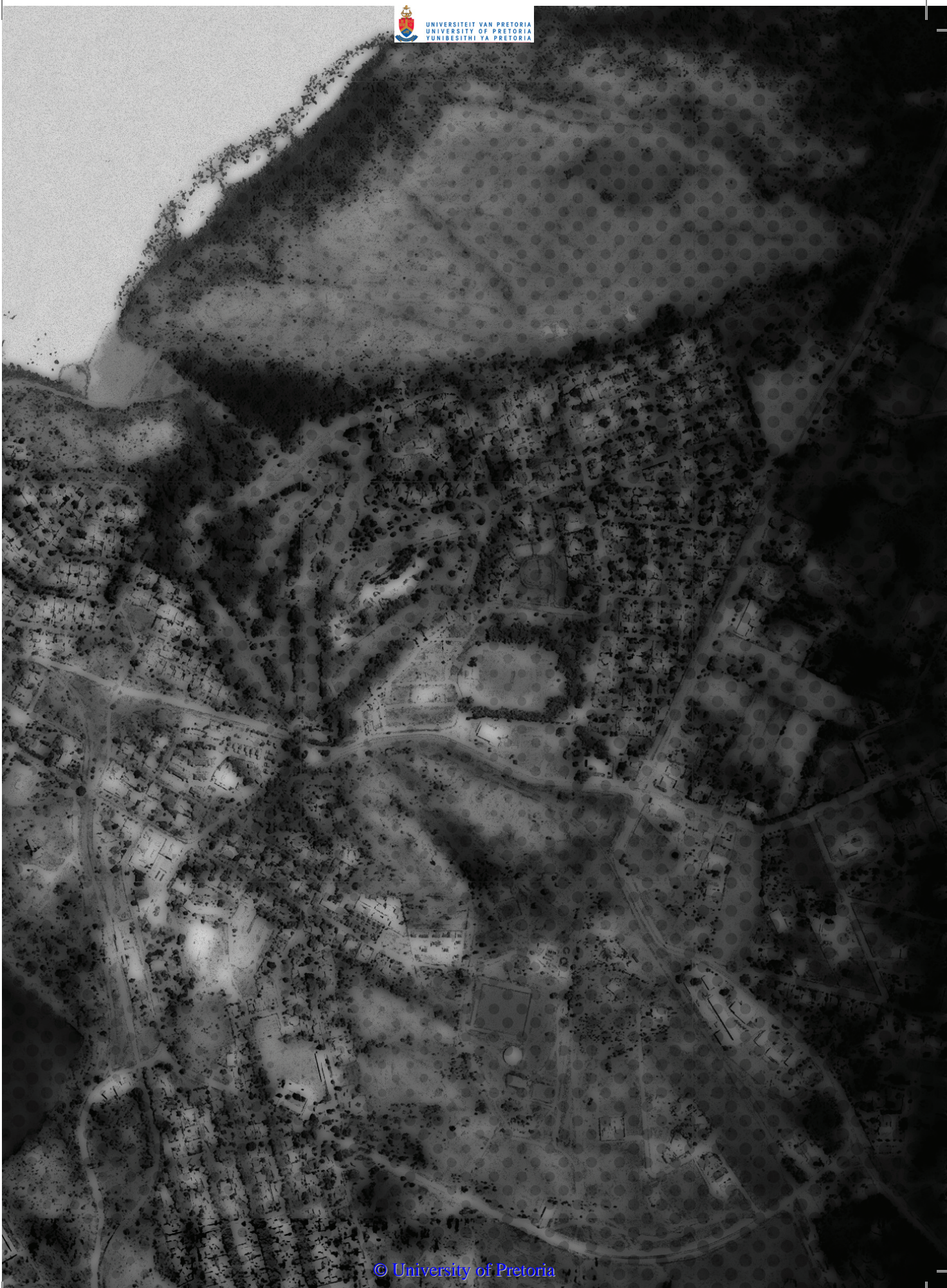
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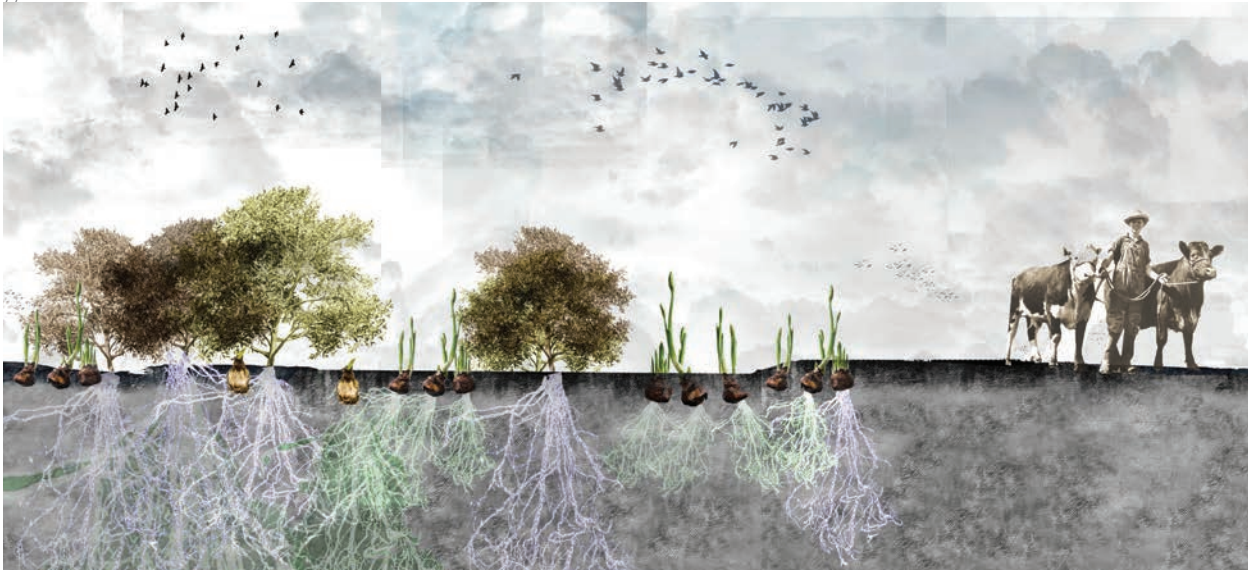
Physical Context

This chapter looks at the current urban condition that surrounds the No. 2 mining shaft compound and the future of the town of Cullinan. This after the mine is expected to be decommissioned within 20 years time, leaving a sizable collection of Kimberlite hills, a slime dam and of course, the enormous open-cast pit, affectionately known as 'the hole'. But other than these visible scars left by more than a century of human interference there is the tall grass, the acacia trees and the crisp skies of the Highveld which are framed by every view in Cullinan; a further underlining of the 'battle' between man, nature and machine.

This is a guide to subverting the machine.









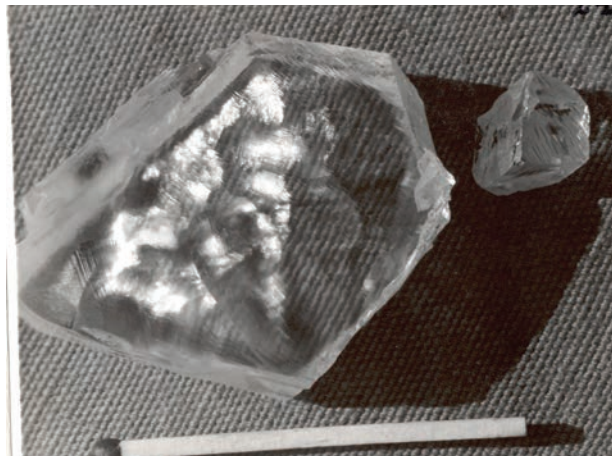


Figure 2.1 (previous page) Photo collage of Cullinan as prospectors settle and begin to find large diamonds, Early 1900's (Cullinan group, 2014)

Figure 2.2 Figure 2.3 (previous page) Photo collage of Cullinan town starting to develop around the growing open cast pit, and the Cullinan diamond presented to King Edward VII which forms part of the crown jewels. (Cullinan group, 2014)

Figure 2.3 (previous page) Mining stops as hard rock is reached and no technology is available to dig further; the hole fills with water. (Cullinan group, 2014)

Figure 2.4 (previous page) Cullinan is host to Italian prisoners of war during World War 2 (Cullinan group, 2014)

Figure 2.5 (previous page) New mining technology allows for tunnels to be dug and for ever deeper levels be mined. The Premier mine is still functional to this day. (Cullinan group, 2014)

Figure 2.6 A matchbox is used to show the scale of a large diamond (Cullinan archives, 2014)

Figure 2.7 The surrounding landscape of Cullinan (Cullinan archives, 2014)

Figure 2.8 The Cullinan diamond (Cullinan history archive (Cullinan archives, 2014)

Figure 2.9 Sorting diamonds (Cullinan archives, 2014)

Figure 2.10 Sir Thomas Cullinan and Fredrick Wells with the famous Cullinan diamond in hand (Cullinan archives, 2014)

Figure 2.11 The main street of Cullinan- Oak street in the early days of the mine (Cullinan archives, 2014)

History

Cullinan is a small mining town located about 30km east of Pretoria and is named after diamond magnate Sir Thomas Cullinan. The economic stability of the town is as a result of the world's oldest diamond pipe, which lies below. In 1898 the first diamond was discovered by a man prospecting up against the fence of the large Elandsfontein farm, which was owned by the Prinsloo family. Cullinan tried to buy the farm from Prinsloo, but in vain. However, Prinsloo died in 1898, shortly before the Anglo-Boer war began. The farm was then sold and prospecting began, with the company being registered in 1902 (Lincoln 2011:142).

The Cullinan Diamond was the largest diamond ever found in the world, measuring a staggering 3,106.75 carats. The jewel was named after the mine's owner and sold to the South African government, which presented it to King Edward VII on his 66th birthday. The diamond was eventually cut into nine major stones and produced approximately 96 smaller diamonds (Lincoln 2011:142).

In 1932 the mine stopped activity due to a lack of technology and the requirement of additional resources, which were needed to prospect deeper. After this, during the Second World War, the mine played host to Italian prisoners of war who were accommodated in the mining compounds. In 1945, mining commenced after the number 1 shaft was able to access the pipe at far deeper levels and mining no longer took place in the open pit. To date, over 355 million tonnes have been extracted from the pit since 1903. Mining currently takes place at 630m and 732m below surface (Lincoln 2011:15).

Cullinan is still one of the world's largest producers of rare blue diamonds; however, many of these blue diamonds are not found underground but in the reprocessing of the mine dumps (the so –called Kimberlite hills). These mine dumps remain in the mine's 'red zone' (strictly off access to the public) and each dump may be reprocessed up to three times (Lincoln 2011:15).

The depletion of non-renewable resources over time is inevitable. It has been announced that the Cullinan diamond mine will be fully closed in 2062 (Reynecke 2011:7). A process of de-industrialization will occur over the next few years and it is expected that the town of Cullinan will again re-establish itself in a 21st century agricultural and rural milieu.

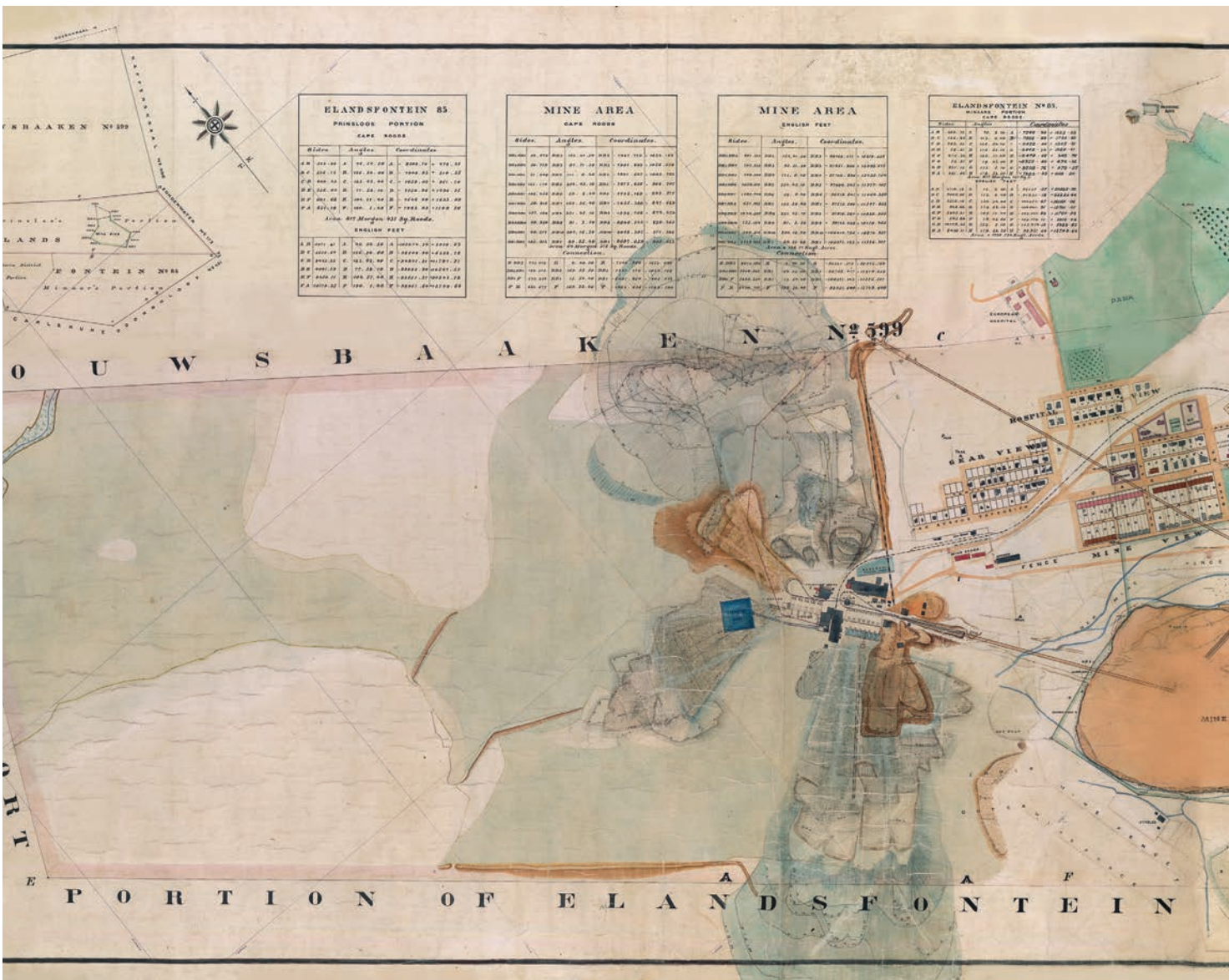




Figure 2.12 Surface plan of premier diamond mine (Cullinan archives, 2014)



ET IN ARCADIA EGO – The new ruralism

To turn in desperation to a spacious and mythicised image of the rural as a relieving alternative to the evils of the urban, to find solace in a trivialized and disingenuous myth of a 'green and pleasant land', to wistfully invoke the emblematic memories of the English Romantic poets (Shelley notwithstanding) as a bellwether of socio-political sentiment, to dream of a lost and forsaken Avalon persisting beneath the detritus of urban capitalism, is to long for a return to something that never achieved any material existence whatsoever. What is required from architects is a critical understanding of an imminent agrarian reality in opposition to the globalising city, and a critical approach to regional relations. - Kevin Rhowbotham (2013:138)

Figure 2.13 Early blasting progress of the open cast pit (Cullinan archives, 2014)

The question needs to be asked, as with all the other towns in South Africa built on the backs of 'valuable' earth and soil, what catalyst is needed to ensure that the town is able to stand-alone once the mine is no longer in operation?

The pastoral setting

The History of Urban Form (Morris 1994:2) forms a basis for the widely accepted belief that the reason for the development of early settlements was agriculture, and that it was the essential prerequisite for the evolution of urban settlements. Man was continuously in search of the best land where he could subsist and that provided the ideal determinants for the establishment of a settlement (Morris cited in Labuschagne:2013).

Initially the area of Cullinan, then the farm Elandsfontein, was dedicated wholly to agriculture. There are still many farms in the area, as well as the Willem Prinsloo Agricultural Museum, which is in close proximity. The food produced in the area is reserved mainly for the large cities of Gauteng, Pretoria and Johannesburg. Connection with nature was stronger in the past and the harboring of renewable resources meant that the land had a chance to regenerate itself. It is expected that Cullinan will return to its agricultural heritage once mining has ceased.

With the arising of a global interest in sustainable and organically grown food practices, a global food crisis as well as looming water shortages in an already dry Highveld, agriculture will have to play a new role in a post-decommissioned diamond town.

The tourist town

The eminence associated with the discovery of the largest ever diamond, its pleasant rural setting and close approximation to Pretoria, has meant that Cullinan has become a popular day trip for tourists and weekenders. Cullinan also has many buildings of heritage significance, including the structures used at the mine. Of particular importance to this dissertation is the inclusion of the mining compounds within the narrative presented to visitors; the compounds remain isolated from the rest of the town and tell a different story to the published achievements that Cullinan boasts of.

The tourist industry thus holds potential in terms of potential programmatic intervention. It is intended to avoid the possibility of the town becoming 'static' by taking a contrasting approach to that producing a 'taxidermist effect': buildings of heritage significance and mining equipment are not envisaged as standing as static 'museums' to their history. The urban vision of Cullinan plans to reincorporate the stories and tangible industrial heritage with exciting eateries and artisanal food producers alongside one another. It is also proposed that the steam train become operational again in combination with bus trips and bicycle rental opportunities that enable visitors to travel from the station to the mine, the town and to the No. 2 shaft compound.

FORBS



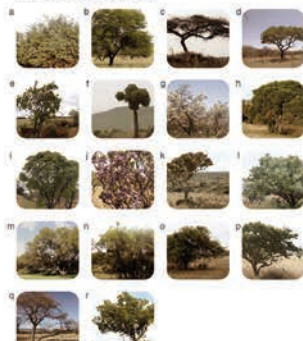
- | | | | |
|---|---------------------------------|---|---------------------------------|
| a | <i>Acalypha indica</i> | j | <i>Boophaea alvina</i> |
| b | <i>Achyrocline satureioides</i> | k | <i>Chulianthea lita</i> |
| c | <i>Ageria digitata</i> | l | <i>Chromolaena odorata</i> |
| d | <i>Alea davyana</i> | m | <i>Cleome viscaria</i> |
| e | <i>Aster pectinatus</i> | n | <i>Cratogeomys angustifolia</i> |
| f | <i>Anthemum thymifolium</i> | o | <i>Helichrysum rugosum</i> |
| g | <i>Baccharis viridula</i> | p | <i>Hypoxis hemerocallidea</i> |
| h | <i>Berhavia tenuifolia</i> | q | <i>Rapanea muricata</i> |
| i | <i>Bidens pilosa</i> | r | <i>Xanthoxylum</i> |

GRASSES



- | | | | |
|---|---------------------------------|---|------------------------------|
| a | <i>Acacia karooensis</i> | j | <i>Heteropogon contortus</i> |
| b | <i>Cymbopogon varius</i> | k | <i>Hyparrhenia aristata</i> |
| c | <i>Digitaria pruriens</i> | l | <i>Imperata cylindrica</i> |
| d | <i>Diheteropogon angustatus</i> | m | <i>Loudia linearis</i> |
| e | <i>Eragrostis chlorimollosa</i> | n | <i>Melinis repens</i> |
| f | <i>Eragrostis curvula</i> | o | <i>Setaria sphacelata</i> |
| g | <i>Eragrostis lehmanniana</i> | p | <i>Themeda triandra</i> |
| h | <i>Eragrostis tenebrosa</i> | q | <i>Trachypogon sordidus</i> |
| i | <i>Heteropogon contortus</i> | r | <i>Tripsacum daniellii</i> |

INDIGENOUS TREES



- | | | | |
|---|-----------------------------|---|---------------------------|
| a | <i>Acacia karooensis</i> | j | <i>Mundulea senilis</i> |
| b | <i>Acacia saligna</i> | k | <i>Ochna pulchra</i> |
| c | <i>Acacia saligna</i> | l | <i>Phoradendron</i> |
| d | <i>Burkea africana</i> | m | <i>Rhus lancea</i> |
| e | <i>Combretum molle</i> | n | <i>Rhus leptodermis</i> |
| f | <i>Curatella pumila</i> | o | <i>Rhus pyroloides</i> |
| g | <i>Dombeya rotundifolia</i> | p | <i>Styphelia pumila</i> |
| h | <i>Euclea natalensis</i> | q | <i>Terminalia</i> |
| i | <i>Ficus</i> | r | <i>Ziziphus mucronata</i> |

STREET NAMES



- | | |
|----|--|
| 1 | Das Street - (<i>Dasia subulata</i>) |
| 2 | Kameeldoring Street - (<i>Acacia erubescens</i>) |
| 3 | Sukkerbos Street - (<i>Protea cynaroides</i>) |
| 4 | Sonnia Street - (<i>Melia azadirachta</i>) |
| 5 | Olifant Street - (<i>Olea europaea africana</i>) |
| 6 | Protea Street |
| 7 | Mimosa Street - (<i>Acacia drepanolobium</i>) |
| 8 | Jamnia Street |
| 9 | Papiermolen Street - (<i>Acacia saligna</i>) |
| 10 | Jacaranda Street - (<i>Jacaranda monosperma</i>) |
| 11 | Burgum Street - (<i>Albizia julibrissin</i>) |
| 12 | Willow Street - (<i>Salix babingtonii</i>) |
| 13 | Baldie Street - (<i>Adiantum digitatum</i>) |
| 14 | Pine Street - (<i>Pinus fitzingeri</i>) |
| 15 | Poplar Street - (<i>Populus canescens</i>) |

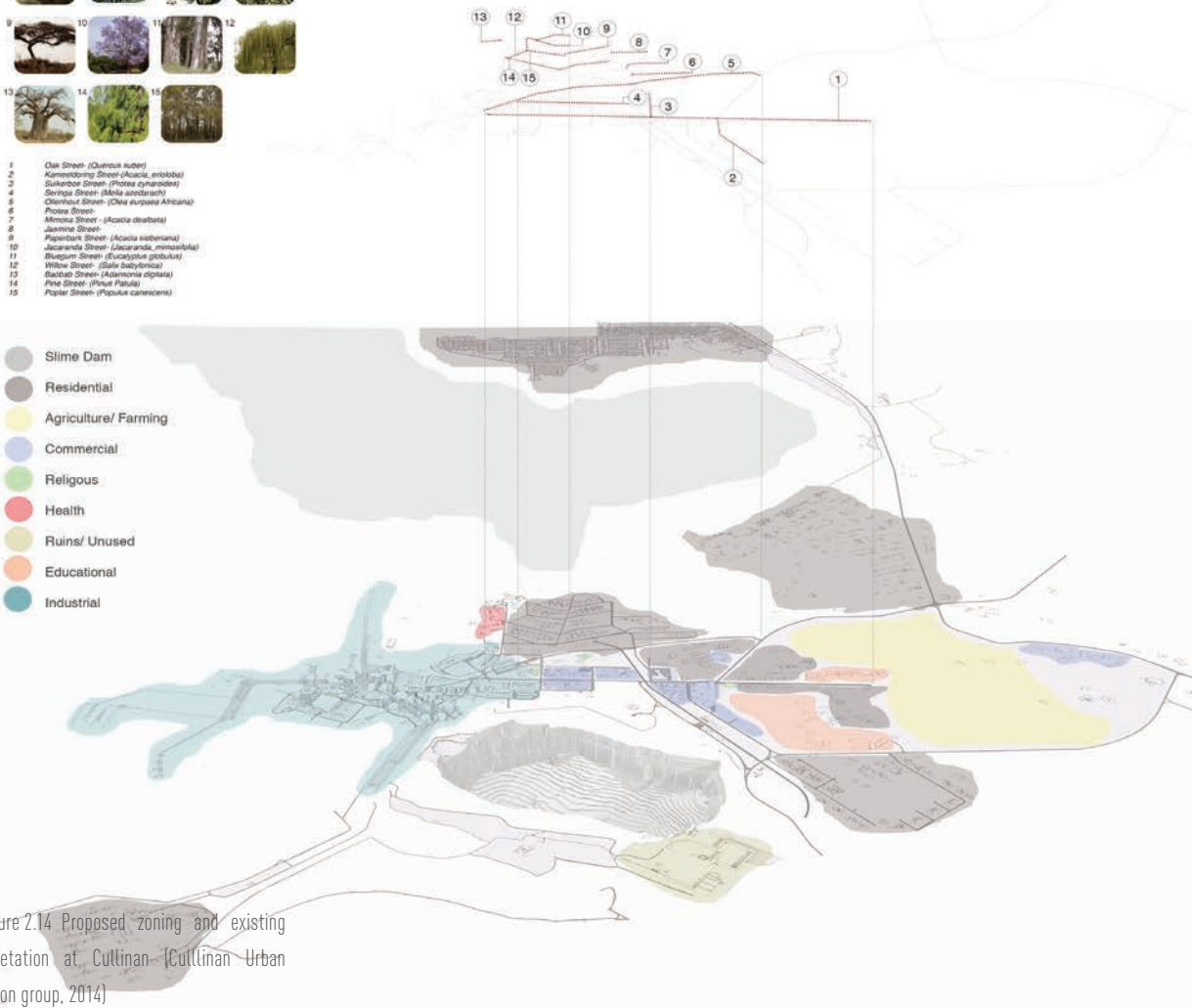


Figure 2.14 Proposed zoning and existing vegetation at Cullinan (Cullinan Urban vision group, 2014)

Light Industry and the university town

Cullinan has been identified as a skills development and education destination, along with agriculture and light to medium industry that may make use of the town's skilled people and the available decommissioned mining paraphernalia.

The township of Refilwe is home to 15 000 people, many of whom rely on the mine as their main form of income. After the mine is no longer functional, these people will be without work. Cullinan might partner with the University of Pretoria or the Tshwane University of Technology to host a campus involved in trade skills development as well as an agricultural and plant sciences faculty. This would encourage the influx of young people and keep the streets of Cullinan lively and eventful.

The landmarks

The hole

The open pit is probably the most noteworthy landmark in Cullinan. It is approximately 1500m long, 1000m wide and 500m deep, and is four times the size of the Kimberly Big Hole (Lincoln 2011). The hole presents both a fascinating and terrifying condition to the town of Cullinan. Most of the town is straddled along the northern edge of the hole in an easterly direction towards the No. 2 mining compound, which is directly south of the mine. The average dip of the sidewalls is 85°, and as a result, the diameter of the hole is constantly expanding: approximately 70 million tons of sidewall has collapsed into the tunnel to date. As such, there is a 100m/100 year break-back line that may result in some structures of the mine and the No. 2 compound falling in (Lincoln 2011).

The proposed vision for Cullinan has allowed for a ring road to carry traffic through the town's main artery of Oak Avenue and back onto the R513 to Pretoria. This would be a smoother alternative to the current abrupt stop at the entrance to the mine, with traffic having to turn around awkwardly to return to Pretoria. With the mine now being open to the public, traffic will be linked through existing service roads, past the No. 2 compound complex. This intervention acts as a primary spatial structure, with a secondary structure that feeds from it with proposed medium density housing and commercial buildings.

The hole is identified with the identity of Cullinan and it is said that there are plans for it to act as a reservoir for Pretoria. The secondary spatial framework will provide perpendicular links to the hole as most of the development to Cullinan runs parallel with the hole, often seeming as if the hole can simply 'pass one by'.

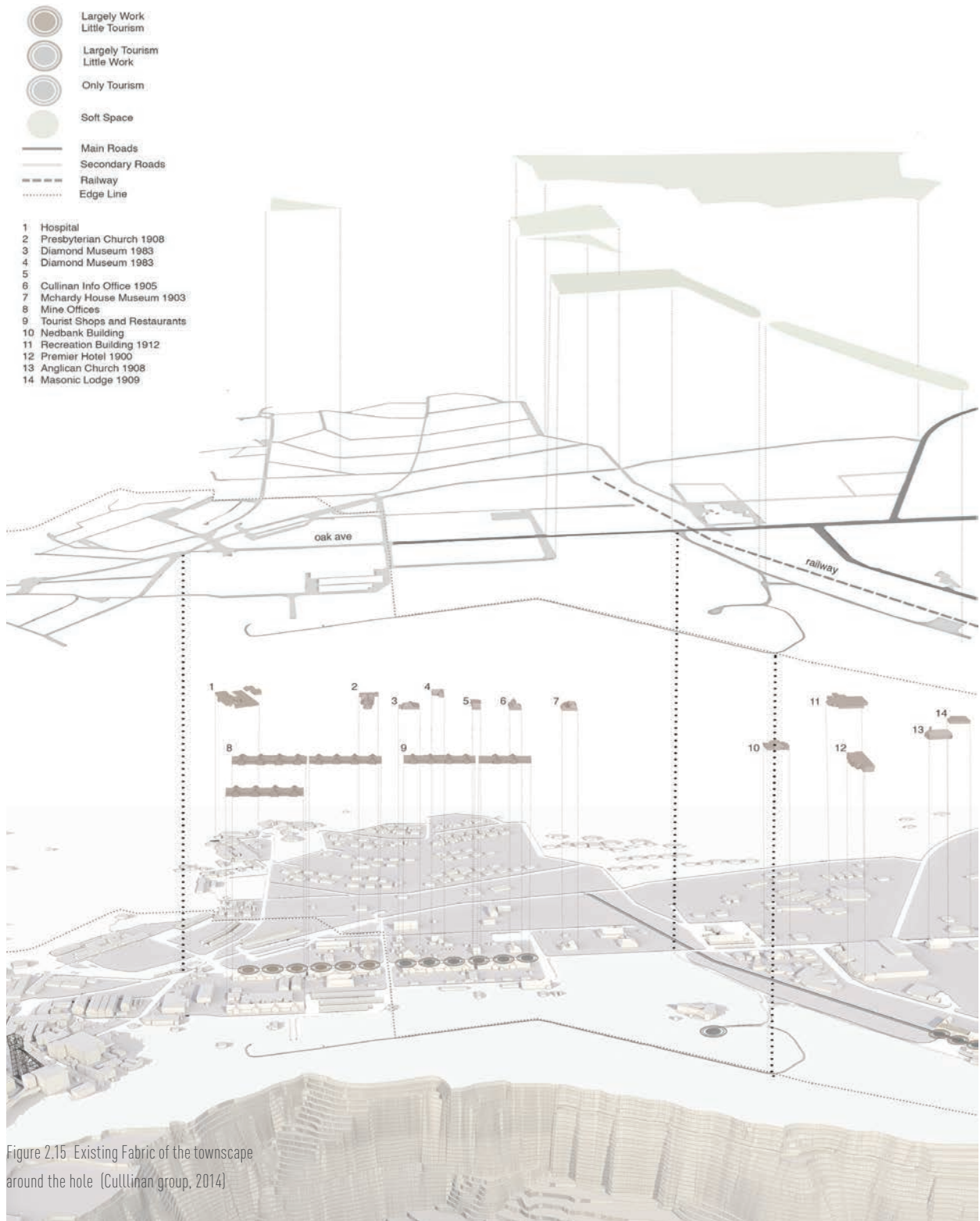


Figure 2.15 Existing Fabric of the townscape around the hole (Cullinan group, 2014)

The mine

The No. 1 shaft of the mine, which is still currently in use, will act as a central gathering point and parking facilities for the visitor. A large public square forms around the shaft and will form the catalyst to the re-wiring of the machine - this through light industrial re-adaption of the existing infrastructure. Vegetation around the hole will remain unaltered and natural, in order to promote soil stability directly at the perimeter. However, further up, after the 100-year break-back line, the new framework hopes to implement an agricultural belt, wrapping around from mine to compound as a way of linking isolated entities through a pastoral intervention.

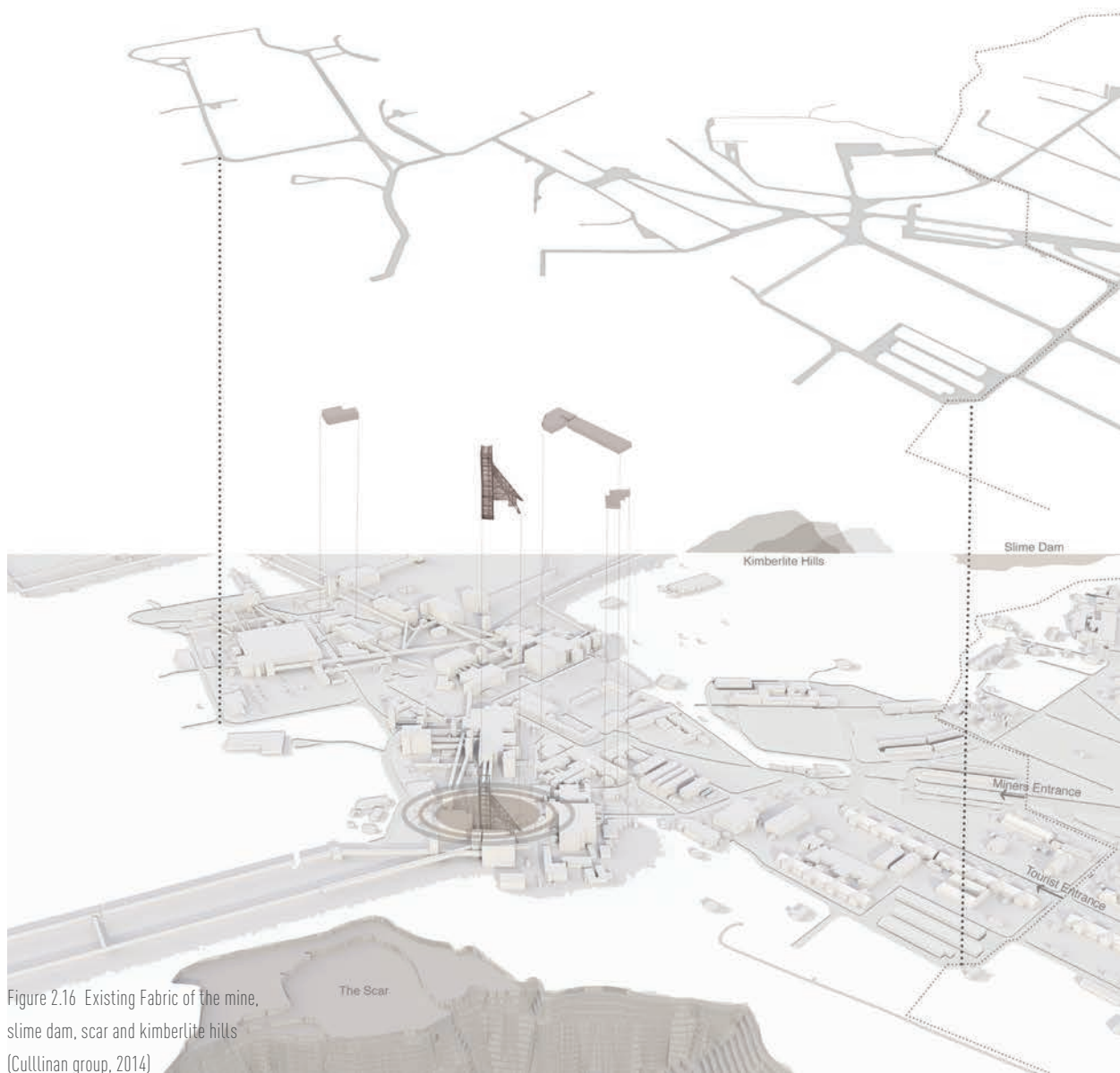


Figure 2.16 Existing Fabric of the mine,
slime dam, scar and kimberlite hills
(Cullinan group, 2014)

STUDY AREA: MINE
Walter Raubenheimer
Marcel Mattheus

orchards

orchards

vetiver /
grain crops

STUDY AREA: CULLINAN TOWN
& VENT SHAFT
Nikita Edwards

natural
landscape

productive
vegetation

Hemp production

Hemp production

STUDY AREA: COMPOUND
Paige du Toit
Natasha Laurent
Hugo van Niekerk (Landscape Architecture)

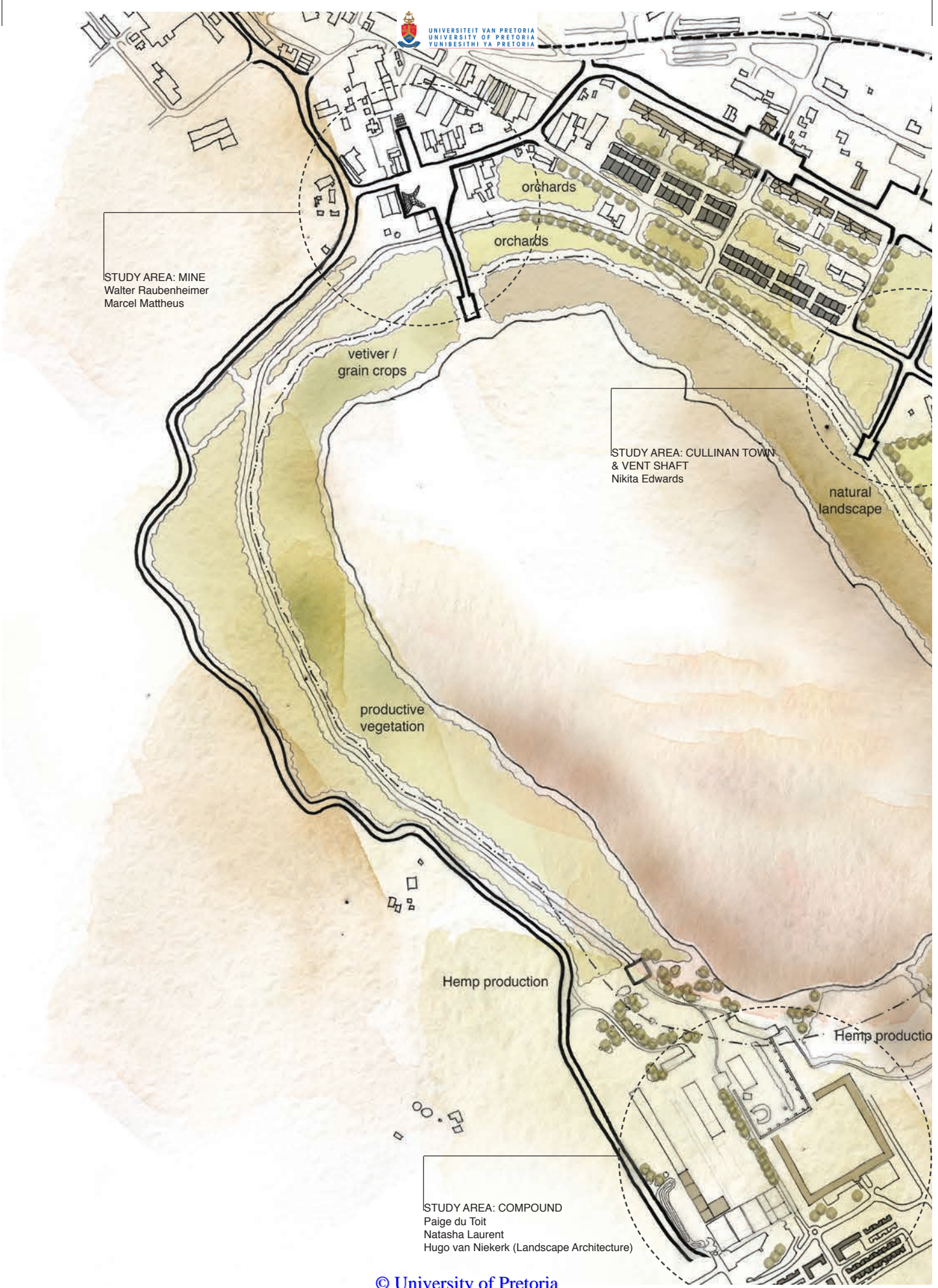









Figure 2.17 Proposed Urban Framework for Cullinan (Cullinan Urban vision group, 2014)

- Proposed buildings
- Existing buildings of Heritage Significance
- Existing buildings
- Natural landscape
- Productive/Recreational Green Space
- Primary Spatial Structure
- Secondary Spatial Structure
- Existing Railway



<p>AGRICULTURE</p>  <p>1</p>	<p>> Cullinan should become the core of the larger regional agricultural hub and a new agricultural strip should be introduced around the big hole to support new local micro-industries related to agriculture</p>
<p>TOURISM and HERITAGE</p>  <p>2</p>	<p>> The vision will expose the heritage value of Cullinan to society and use it as a source of revenue and support for the community</p> <p>> Tourists will become a market for produced commodities</p> <p>> The large open pit should be retained as is after mine closure as it is an important part of Cullinan's narrative and also a major tourist attraction. The impact of the instability of the hole is recognized. A new "agricultural route" for tourists is established around the hole marking the 100 year breakline of the hole. Existing mine pumps used to currently dewater the hole will be used to remove water from the hole, when necessary, to support surrounding agriculture</p>
<p>LIGHT INDUSTRY</p>  <p>3</p>	<p>> Support those who have been trained in the community</p> <p>> Generate new income and resources in a resilient manner</p> <p>> In Cullinan, there potential to reuse old industrial buildings for new forms of production</p>
<p>ECOLOGICAL</p>  <p>4</p>	<p>> The scarred landscape consisting of mine dumps in the form of kimberlite tailings and the slime dam needs to be rehabilitated in order to prevent its negative effect on the ecology and industries (such as tourism and agriculture).</p> <p>> The plant species used for rehabilitation and remediation must not be invasive and must be able to establish a new habitat for endemic species and endangered species like the Rand Highveld Grassland vegetation type.</p>
<p>EDUCATION</p>  <p>5</p>	<p>> Support and educate the unemployed community and Retiree</p> <p>> Resilience is created through complexity of activities</p>

THE VISION



PRIMARY AND SECONDARY ROUTES

- Primary Route
- Secondary Route

Description:

The Primary route focuses on connecting the decommissioned mine; the existing town and the old mining compounds. The route continues around the excavated hole allowing people to view the scar in the landscape from all angles. Along the primary route new public squares have been designed to define certain areas of the town and to create more of a pedestrian friendly route where shops and restaurants can spill out onto these spaces.

The Secondary Routes are then allocated closer to the hole. These routes are designed for pedestrians and bicycles. It allow people to meander around the hole to the different interventions and viewing points.



NEW DEVELOPMENT

- New Development

Description:

The new development throughout the town will mainly contain accommodation and facilities for agricultural based education. This development is again centred around the scar in the landscape and provides a further connection between the town and mining compound



GREEN SPACES

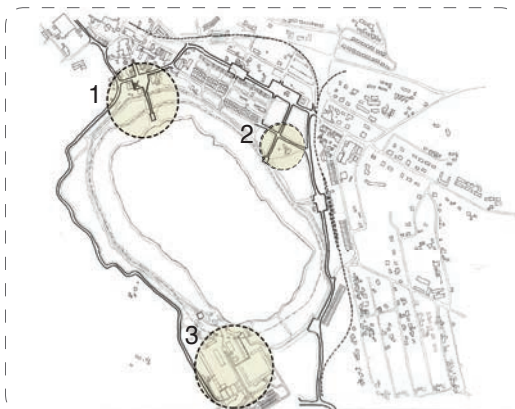
- Natural Bushveld
- Productive land
- Recreation space

Description:

The existing landscape has been developed into a productive landscape where all the new interventions plug into. On the eastern side of the hole the natural bushveld has been retained with smaller sections of production closer to the town.

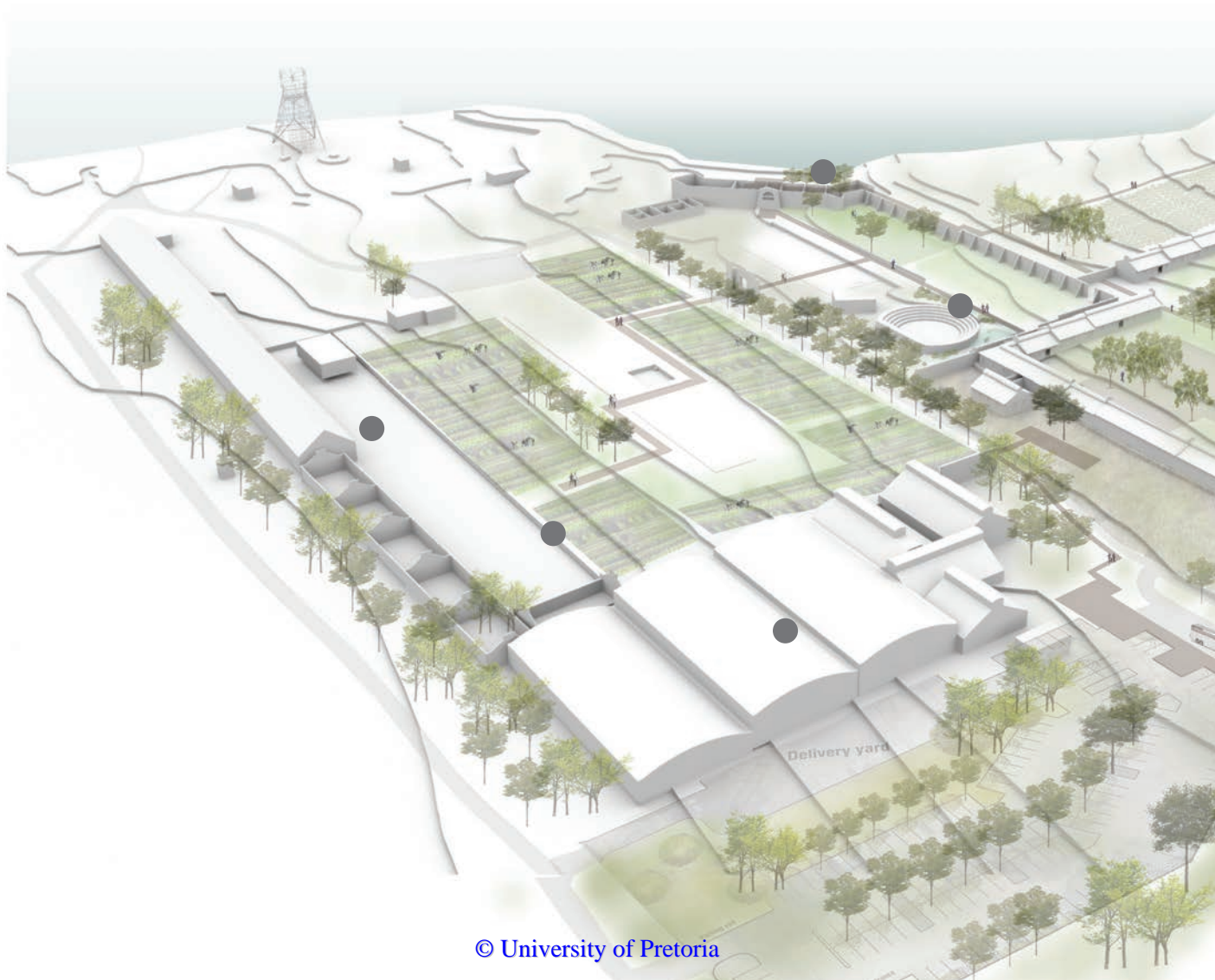
The main belt of productive landscape is allocated on the western side of the hole. This agriculture contains orchards, hemp, and vegetable farming.

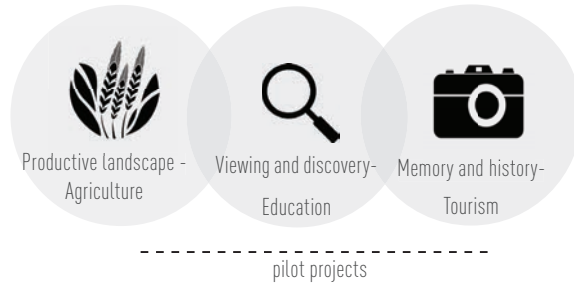
Along Oak Avenue (the main street in town) new recreational green spaces have been designed for the new accommodation as well as a space for festivals and events.



SITE ALLOCATIONS

- 1 MINE: Walter Raubenheimer
Marcel Mattheus
- 2 TOWN: Nikita Edwards
- 3 COMPOUND: Natasha Laurent
Paige Du Toit
Hugo van Niekerk (landscape Architect)





The No 2 shaft compound

Vision

The vision for the compound is seen as comprising of a complex that will bring to light the sensitive nature of the history attached to the abandoned compound (Refer to Chapter 3), while utilizing the large open land spaces for small scale research based agriculture. Research facilities and a degree of small-scale production will support this agriculture. The one side of the compound will accommodate silk and hemp production, and the other, heirloom and organic fruit and vegetables. Buildings will house facilities accommodating research that will investigate the most efficient and sustainable growth of these crops. The research and agricultural component intertwines itself with the narrative of the compound through a tourist route. Focus is emphasized on the experience of the visitor understanding both the introduced production and research in conjunction with the historical narrative.

The significance of each of the structures in the compound is analysed in terms of its historical and cultural significance, in reference to its value in telling the personal story of the miners and the diamond mine. These structures have an age value, and as they are older than 60 years, according to the National Heritage act of South Africa, they may not be demolished. The compound is also unique as there are not many other mining compounds from the diamond-mining era still in existence.

These structures were also analysed in accordance to their current condition, with some of the structures either standing as concrete surface beds, some of the gabled dorm rooms unroofed and in very poor condition while the south eastern compound rooms remain in relatively good condition. The programme will be housed in a new architecture that envelops, in and around, the existing fabric.

Some of the warehouses bordering the compound were known to have once been butcheries; today they stand empty and will serve as suitable light industrial buildings for the packing of fresh produce, refrigeration, compost production, and storage. A greater density is envisioned for the area directly around the compound complex and thus medium density housing and commercial buildings are planned for.

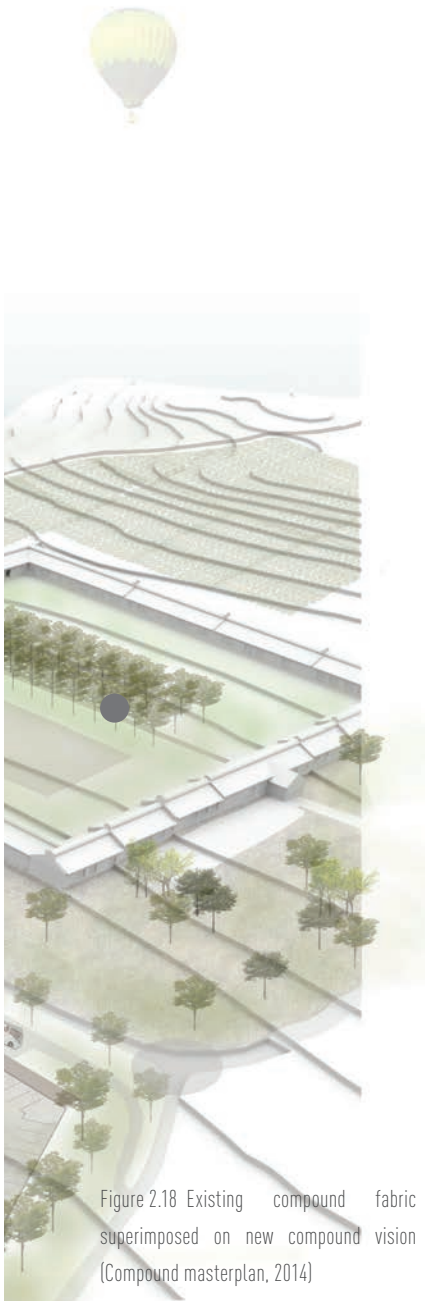
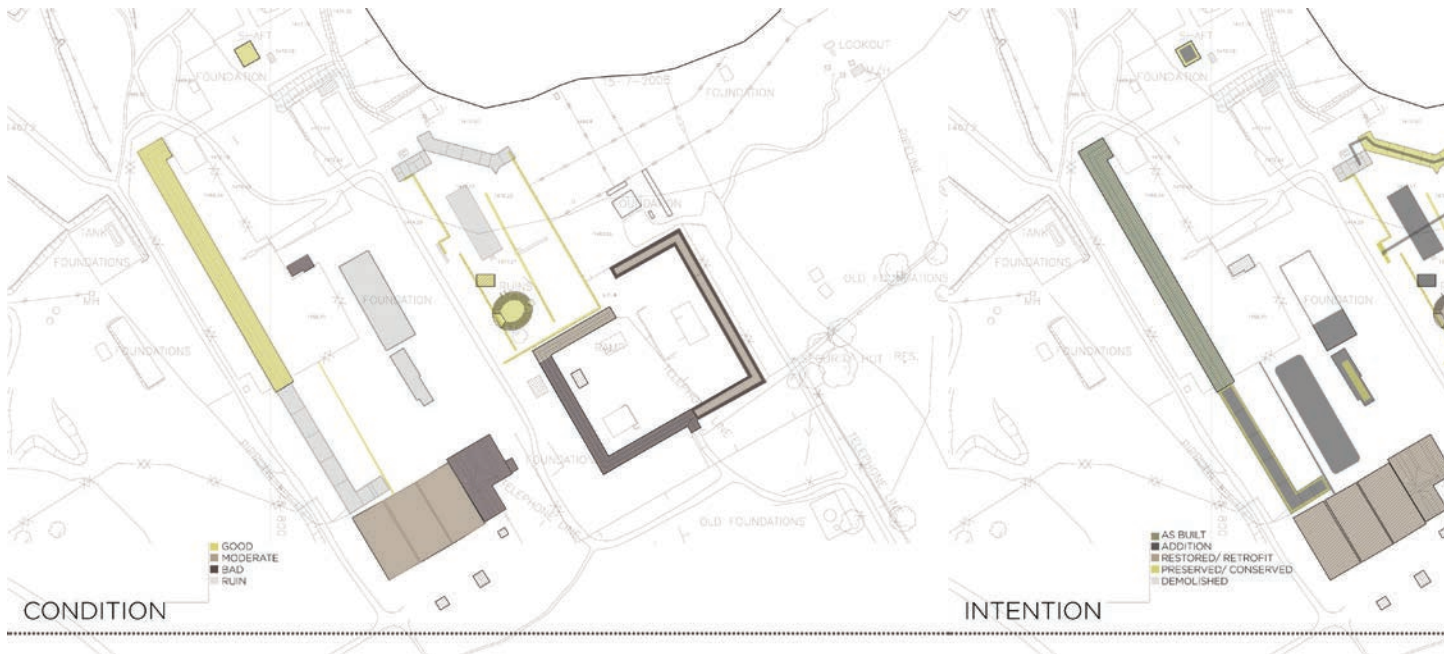


Figure 2.18 Existing compound fabric superimposed on new compound vision (Compound masterplan, 2014)



Access

It is proposed that the main access through the site be retained as the road that currently divides the compound complex into two halves. Vehicular access is no longer permitted into the compound itself and parking, delivery and servicing is provisioned for along the outer perimeter of the compound. The first point of arrival for the visitor is at the entrance to the proposed silk and hemp production and then later past the more delicate historical fabric and ruins situated within the landscape. A footpath cuts across the road and leads people to the building proposed in this dissertation: the exhibition and arrivals hall, greenhouses, herbarium, vegetable patches, research facility and restaurant as a final destination. The restaurant is centered around an existing food preparation site which was used by the miners and can also be accessed by less curious visitors that choose only to visit the restaurant.

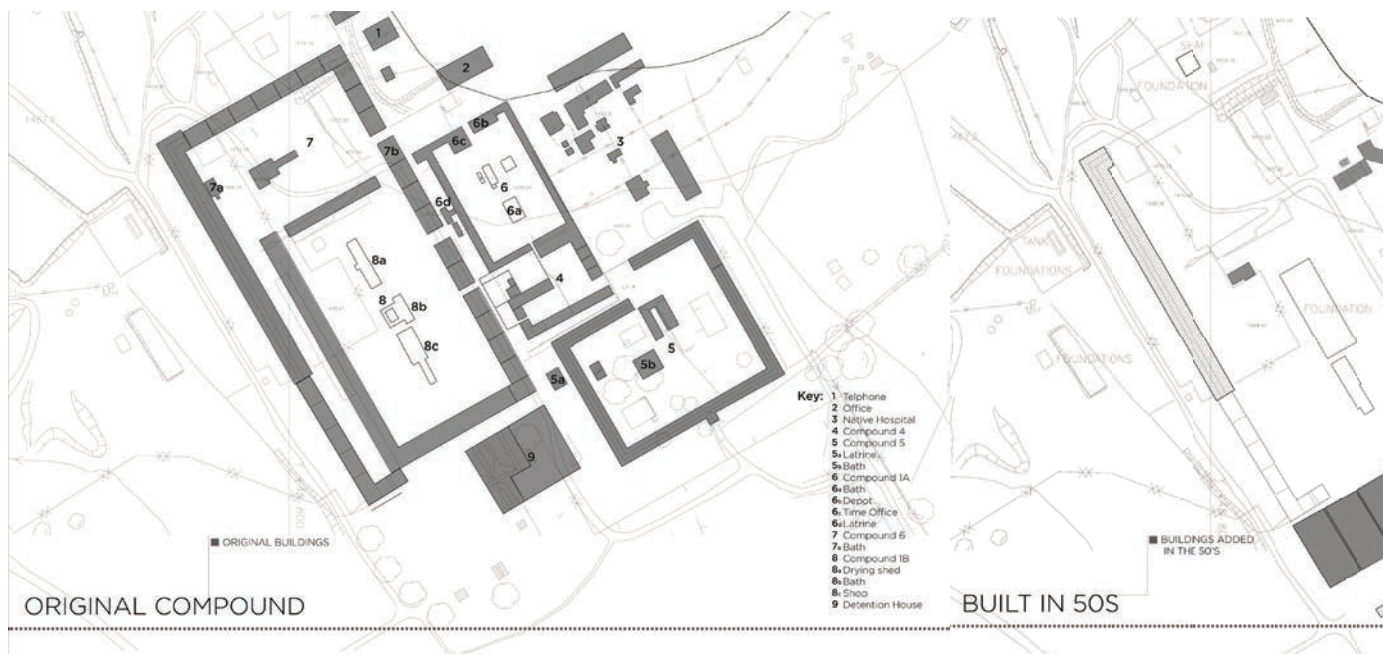


Figure 2.19 Diagrams indicating current condition, intention and significance of compound fabric (Compound masterplan, 2014)

Grid

Through using various elements within the landscape and site, and extending their edges, a grid system was established. The grid system drives decision making by communicating to the designer the inherent pattern on site. By looking and learning from this pattern, reading the landscape becomes easier and informed decisions can be made. Using this information, crossing intersections were identified and a pattern was established.

The grid informed the decision making process for zoning and building placement. Elements that guided this process were walls and boundaries, historic footprints of buildings and structures on site, roads and access routes and finally existing buildings on site. This was then used to establish a hierarchical system, nodes of importance, movement patterns and consequently a framework-zoning diagram.



HERITAGE ASSESSMENT



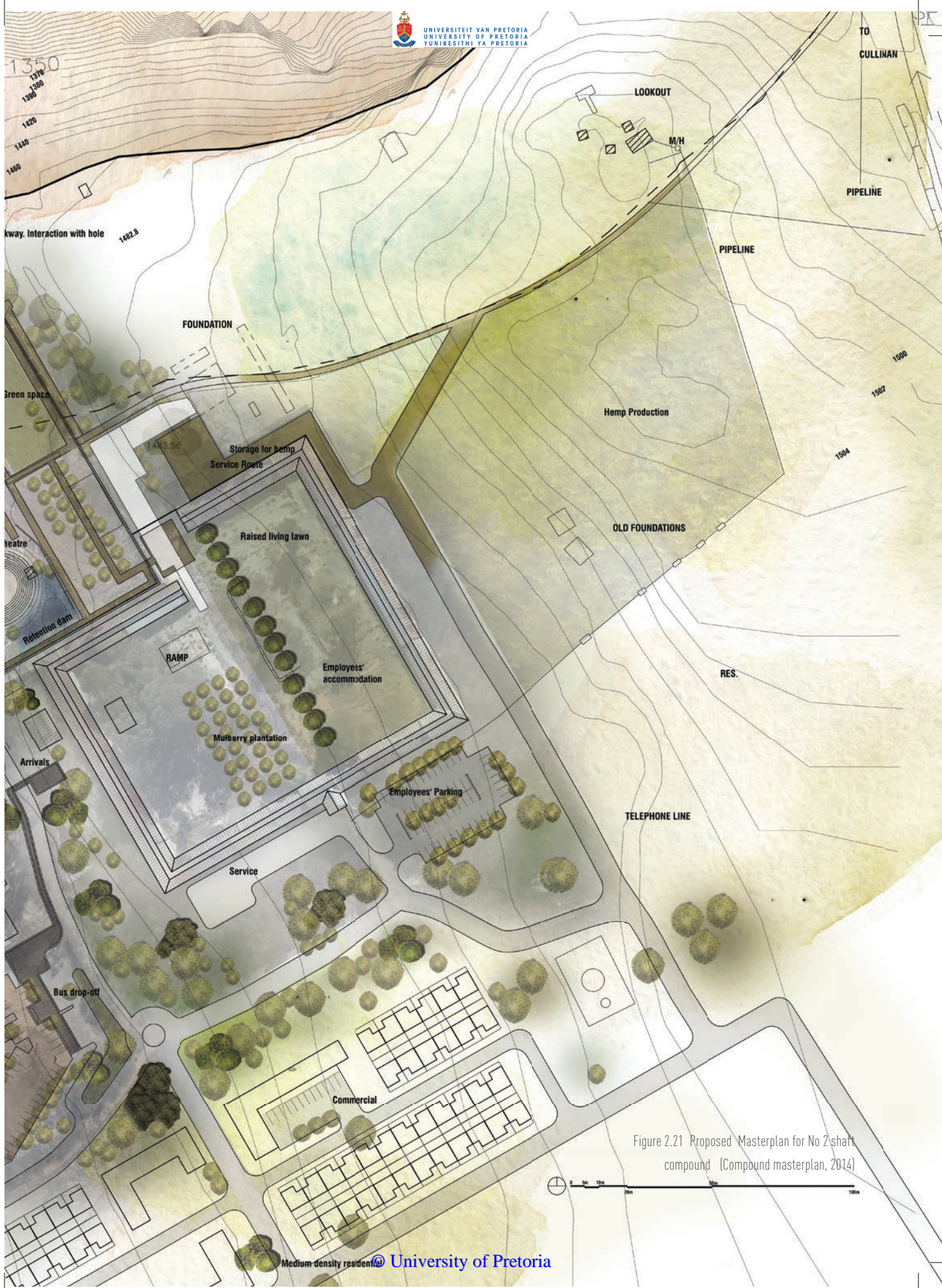


Figure 2.21 Proposed Masterplan for No 2 shaft compound (Compound masterplan, 2014)



Figure 2.22 Photographic study of the compound currently (2014)







Figure 2.23 Aloes free to grow from an existing concrete wash abluition (2014)



Figure 2.24 Existing compound in ruins (2014)



Figure 2.25 Grass growing from existing food preparation and washing square (2014)



Figure 2.26 View from existing wash ablation facilities towards existing industrial buildings (2014)