SHAFT No.2

Re-scripting the future of Johannesburg’s 3rd landscape’s through Architecture of the Terrain Vague

By

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I Dylan Watkins hereby declare that the minor dissertation submitted for the Mtech (Prof) Architecture degree to the University of Johannesburg, apart from the help recognized, is my own work and has not previously been submitted to another university or institution of higher education for a degree.

Signature

Date          25-11-2013
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A special thank you to Rachel Wilson, all your love, support and motivation this year has made it possible to reach my goals.
Fig 0.1 — East view of the proposed site (Shaft No.2) that contextualizes the vegetation and 3rd landscape (Photograph by L. Krige).

Note: The natural regeneration of the synthetic landscape.
In memorable experiences of architecture, space, matter and time fuse into one singular dimension, into the basic substance of being, that penetrates our consciousness. We identify ourselves with this space, this place, this very moment, and these dimensions become ingredients of our very existence. Architecture is the art of reconciliation between ourselves and the world, and this mediation takes place through the senses.

(Pallasmaa 2006: 36)
This report is structured in a way which represents the process of how this thesis was undertaken.

The process of this thesis initiates from personal interests in the re-scripting of the third landscapes. This approach does not allow for preconception in terms of architecture or programme but rather allows the process of discovery to become a catalyst for a program and an architectural intervention which is relevant to the city of Johannesburg.

This process aims to reflect this journey through various media, conceptual sketches, models and text, stimulating the thought process through the phenomenology of architecture, space and time, drawing influence from the city and site. Through the act of drawing and model construction, ideas are interpreted and conceptualised to enhance and strengthen the act of creating architecture. The aim is to fully explore a set of parameters in search for resolution and explore unexpected findings which resonate into a built form.

Broken down into three main parts, this document discusses: the starting point (introduction), research influence (theoretical discourse) and architectural discovery (urban, design and technical resolution), each part influencing the next.

Because this dissertation represents a process, a programme and brief can only be formulated once there is a rich understanding between the theoretical discourse and urban context analysis. The brief aims to propose urban and architecture intervention in the most sustainable, integrated manner.
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Shaft No.2

Shaft No.2 is the number given to the vertical shaft in the Wemmer Pan area. Due to the fact the shaft still exists and is located on my chosen site for this dissertation, I have chosen to pay homage to the existing, and call my site Shaft No.2. The term Shaft No.2 not only represents this dissertation, but comments on the history of the site and the context in which this dissertation is based.

Third Landscape

This term is described by Gilles Clement (2007) as abandoned spaces or topography of former industrial areas.

Terroir

This term responds to the geology and the physical qualities of landscape. This term relates to Shaft No.2’s geological composition of a natural and man-made mining landscape. (Ingold 2000: 195)

Terrain Vague

Terrain vague is also referred to as third landscapes. This term is used to describe Shaft No. 2. The intended meaning describes strange spaces that are internal to the city but exist outside the effective circuits and productive structures of that urban system (Sola-Morales 1995:120).

Genius Loci

This term refers to the spirit or character of place (Fox 2000:139)

Archipelago

The definition of this word is; a group of islands. I use this word to define the mine dumps which exist along the mining belt as these mine dumps exists as a string of islands within the urban fabric of Johannesburg. (Branford 2001: 40).

IDP

This term stands for Integrated Development Plan, this is government issued and includes private role players.
NDP vision 2030

This abbreviation stands for National Development Plan. This is a government issue development guideline and city vision for a sustainable city in 2030 (National Development Plan 2011).

Phytoremediation

This is the process where the use of specific plants and their associated microorganisms stabilize and reduce contaminations in soils, sludges, sediments and ground water (Using Phytoremediation to Clean Up Sites 2012).
By re-scripting the third landscapes of Johannesburg through the systemic integration of contrasting systems, man, technology and nature, a new hybrid architecture is proposed. This hybrid architecture becomes a platform of exchange by negotiating a future from the terrain vague. Thus, this hybrid acts as a catalyst for socio-ecological remediation.
<Fig 0.3: Conceptual collage of hypothesis.
By re-scripting Johannesburg's third landscapes through the systemic integration of contrasting systems, man, technology and nature, a new hybrid architecture can exist.
This hybrid becomes a platform of exchange by negotiating a future from the *terrain vague*. Thus this hybrid acts as a catalyst for socio ecological remediation.
This chapter focuses on the conceptual and practical problem statement of the dissertation in terms of the South African context. The proposed site, background and methodology is briefly presented to contextualize the research questions and dissertation aims.
INTRODUCTION

Johannesburg has a spacial condition of an infill city which has created a condition of ‘non place’, allowing for forgotten beauties within this disjunct urban fabric. In the author’s opinion, this condition of ‘non place’ allows for new exciting opportunities to connect this isolated landscape with its urban surrounds, manifesting a new urban layer.

It is within this urban archipelago that an architectural intervention will be realised. Commenting on the hypotheses, the architecture should become a space within which nature can grow and become part of systemic exchange, creating a new urban ecology. When architecture and nature are fused, a new hybrid emerges, re-scripting the site of terrain vague into catalyst for socio ecological remediation.

The architecture will not only attempt to re-script the third landscape, but also become a platform for exchange where knowledge can be obtained and shared through the tracing and recording of the landscape and climate influence.

This dissertation explores architecture in a manner which will incorporate nature and remediation as a generator of the architecture of the terrain vague. By introducing biometrics and technology, the architecture becomes an instrument of the site, in this way the architecture will respond to site and climate conditions, resulting in a systemic symbioses with nature. The architecture will respond to environmental conditions; expanding, contracting, moving and adapting, creating a different experience for the user on a daily basis.
<Fig 1.1: View from Shaft No.2 looking North West to the city (photograph by L. Krige).
Shaft No. 2 is identified on an seemingly isolated and historic site, situated between two mine dumps on the southern periphery of Johannesburg Central Business District (CBD). The name Shaft No. 2 originates from the name of the shaft which exists on this specific site.

Wemmer Pan, which services the residents of Rosettenville, lies just south of the proposed site and is a socially active lake, with rowing and swimming training being a main activities as well as attracting festivals during the year. To the east lies City Deep and to the west is the beginning of a light industrial belt which acts as a gateway into the city from the South.

The site is situated between the elevated M2 highway, forming a continuous boundary to the north of the site and the railroad tracks which carves through the landscape south of the site, (both with a west-east direction) as well as Wemmer Pan Road which forms the main feeder into the city (north-south direction).

Although the site is surrounded by these elements no pre determined activities occur on this site, and the site itself is isolated from the energies of the city.
Fig 1.2 > View of Shaft No.2 (photograph by L. Krige).

Fig 1.3 > Site location aerial
In this dissertation I propose that architecture is used as an instrument for remediation; more specifically of existing situations and scenarios in the built environment which are overlooked. These unnoticed opportunities which exist within the everyday have no prescribed or relevant activity within their urban surroundings.

Lebbeus Woods speaks about these existing conditions as the borderline where the superimposition of various systems take place, reacting and colliding to provide a new landscape (Woods 1998: 30).

This dissertation attempts to pioneer an architecture uniquely developed from the Third Landscape. The site, Shaft No.2 is grounded within a large urban context, surrounded by existing urban systems. The aim is to systemically assimilate a hybrid architecture which integrates nature, people and architecture into a new urban ecology for Shaft No.2. The aim is to re-script the site as a socio-ecological urban system where architecture is an interface for exchanges.

Shaft No.2 is suggested as a ‘non place’, an interstitial landscape within an urban environment, thus becoming the inquiry focus. Ignasi de Sola - Morales describes this as terrain vague, describing strange spaces that are internal to the city but exist outside the effective circuits and productive structures of that urban system. These are the forgotten, unexpected or misunderstood spaces in an urban environment. The evocative potential of these spaces entertain thoughts of what could exist (Sola-Morales 1995:120).
This research project aims to remediate leftover or unused landscapes that exist within the Johannesburg context. The initial aim is to expose Shaft No.2 and its urban condition as a manifestation of the *terrain vague*.

*Terrain vague* is also referred to as third landscapes which are explored and described by Gilles Clement (2007) as abandoned spaces or topography of former industrial areas or nature reserves. This statement comments on the site condition of Shaft No.2. These left-over and unused spaces result in ecological value due to the landscapes being spaces of indecisions in (upon which biodiversity thrives) formulating a potential environment that does not exist in the city’s condition (resulting in a re-used space).

Potentially this systemically integrated architecture aims to be an intervention that interacts with contrasting systems in an urban context, to ultimately function as a closed loop system, in the same that an ecosystem would.
For the aim of this dissertation, the focus of exchanges exists between knowledge, programme, environment, landscape and tectonic. The intent is to negate architecture into an integrated urban and socio ecological city system. A description of the listed exchanges has been elaborated on:

**Knowledge**

The first exchange is to gain understanding of the third landscape by working in conjunction and establishing a projected connection with Neon, an independent observation ecological network (Neon 2013). Their aim is to collect and analyse data of climatica and geological conditions. The collection of ecological, climatic and environmental data will aid in education and knowledge of environmental remediation. This knowledge would be invaluable to constructive development and be shared on an open source network, sharing knowledge locally and globally between scientists, educators, students, decision makers and the public. The data will be translated into information which will engage many audiences, promoting a broad ecological literacy.

**Programmatic**

The second exchange focuses on a programmatic platform for the mediation between the third landscape, architecture and people. The programme should aid in the collection and facilitation of knowledge for the development of a integrated urban system. This new urban system must contain a closed loop system of architecture, people and natural systems.
Tectonic

The third exchange will explore the tectonics of urban systems. In order to create a hybrid that mediates the above exchanges, the tectonic response should not exist in a stagnant contemporary state, but rather needs to be able to respect, preserve and enhance the exchange between nature, technology and people. The tectonics of this hybrid urban system should encourage the ability to reflect the evolutionary state of Shaft No.2 and the urban environment.

Landscape

The exchange between landscape and architecture is very important. This exchange aims to challenge current development trends of maximum built fabric and minimum natural context. Special favour should be given to the landscape, allowing for remediation which encourage open space networks, public spaces and environmental green spaces. The landscape itself should be the urban knit which does not currently exist with the urban context of Johannesburg.

Environmental

The environmental exchange exists between all four of the above mentioned. The aim is to enhance the architecture system by welcoming nature and the environment, so that it can evolve and adapt as it requires. in this way, environmental cohesion can exist in symbioses with man, architecture and nature. The architecture provides a platform for natural growth, essentially creating an ecosystem in which knowledge, programme, tectonic and landscape expand to create a closed loop urban ecological system.
Fig 1.5 ➞ mind map of systemic exchange.

Fig 1.6 ➞ View of Shaft No.2 looking south.
This dissertation attempts to pioneer an architecture uniquely developed from the Third Landscape.
HISTORY AND CONTEXT BACKGROUND
< Fig 1.7. Map of Johannesburg layout 1896 (courtesy of Museum Africa).
Modern day Johannesburg (1720), described by Boer trekkers as grasslands raising up in a series of ridges, was once an untouched and anonymous place. The area was occupied by the Tswana, who were a hunter-gatherer people, and served as an appropriate habitat for the vast number of herd they had to feed. Witwatersrand being described as one of them- ‘its gold all unsuspected, full of perennial springs, the ridges form a low escarpment of their own above a vast arena of shallow valleys and plains’) unaffected by man, it can be regarded as ‘virgin landscape’ (Chipkin 1993: 3).

Today the city of Johannesburg may be viewed as one of the newer cities to have emerged in the world. The ‘valleys and plains, along with the grassland also afforded the dwellers ample
seasonal game to hunt (ibid). This tentative claim of prehistoric Johannesburg as a place of ephemeral grazing and hunting resonates in what was to become the emergence of the late 19th century city. 1886 is credited as the year that the city was established (Heritage 2012).

This history of what seems like two different places is a curious characteristic that gives this city its identity. Lindsay Bremner (2010:1) posits that the city never fully reveals itself. She claims that behind the (dis)connections, multiple layers and landscapes are secrets and potential for the discovery of ‘more’. These ‘facts’ of recorded history are thus metaphors of the emergence of a city with a history that partially conceals its negative truths.

< Fig 1.9. Diagrammatic representation of Johannesburg, mining belt and surrounding suburbs. Note >The outline represent the fragmented urban development.
There are two specific physical influences considered for their definition of what was to become the city of Johannesburg. The mining activity itself was instrumental in creating barriers and pockets to which (the second) apartheid city planning was to further enhance a segmented city. These physical measures were instruments used by the European settlers to control the very trajectory of who would partake of the material riches that would be recognized at the discovery of gold.

The discovery of gold and the realisation that black migrant labour would be needed created the first potential for conflict. The gold rush resulted in the most unprecedented urban growth in South Africa. By 1896 the town of Johannesburg had outstripped Cape Town to become the biggest in South Africa (measured by population). So much was the rapid growth and industrialisation that on September 28, 1902 a reported 15 000 mining applications per week for gold mining permits were processed by officials in Johannesburg (Giliomee 2007).

As the city grew in industrial strength, so too did the migrant black worker population. The Group Areas Act is often seen as the defining tool used to create the apartheid South African city. However, by 1950 (when the Group Areas Act came into law) Johannesburg had already become a pre-eminent city, even by global standards. The earlier legislation such as the Natives Act of 1923 gave the authorities control to restrict most Africans to township and compounds located on the periphery of the city. The Areas Reservation Bill of 1926 and the Slums Act of 1934 became instrumental...
in entrenching of the emergence of a city that was segregated according to race and ethnicity. Whole communities could be moved to ‘housing estates’ where the emphasis was on grouping inhabitants according to creed (Mabin 1992: 408-409).

On a purely physical level, both the mining and the racially based city planning of Johannesburg seem to be a triumph in creating separate identities between its inhabitants. But this assertion is one that refuses to acknowledge the very contradictory result thereof. I use the term contradictory as a means of expressing how the nature of segregation in the planning brings rise to crossings, chance meetings and daily transits between the ‘segregated’ and the ‘segregator’. These encounters, both past and present, give suggestions of a city in perpetual tension, disconnect and search for meaning in a landscape that was created to conceal the one from the other (Twiddle SA: 1).
The 1994 elections signaled the end of apartheid rule in South Africa. This occurrence is significant in that it brought about a change in the inclusion of the majority to democratically elect whom they want to govern the country. However, the democratisation of the people would take place in a physical, and socially, scarred landscape. Johannesburg as the post mining landscape, is an inquiry into the potential for re-negotiation, clashes, meditations and experiences between its inhabitants, in the search for meaning.

The mining and the realisation of a segregated city planning have created a city which requires an honest acknowledgment of disconnection. Present-day Johannesburg is an unstable urban landscape. An environment where abandonment and neglect have left once-
valued and stable parts of the built environment and the mining ‘complex’ in decline and ruin. This decline in its physicality has not, however, stifled its horizontal growth. This growth has seen the emergence of both luxury estates, almost at the same measure as places of squalor, slums and edges of despair (Murray 2008: 4).

These distinctly disparate conditions in time and space leave, what Andrea Hyseen (Findley 2005: 148), calls the “twilight of memory”. This is referred to as the gap between the past and the present. The chosen site for this thesis thus provides a suitable landscape for an architectural intervention to pose questions and give opportunity for filling in the disjuncture. Shaft No.2 should thus be viewed as baggy space. This is space which is best experienced as having significant value without inherently prescribing specific values. The approach then would be to create an architectural expression that challenges the historic notion of permanence, restriction and separation (Findley 2003: 105).

If it is to succeed as an architectural intervention the project and its programme should create space where past and present can be negotiated. It is where stories of both the positive and negative may be expressed freely.
A city brief - New vision 2013 onward

“Unless we think and use both logic and imagination, the planet will be quickly covered with the rotting scabs and exploding eczemas of decayed industrial settlements and the explosion of shanty towns for the poor that surrounds cities for the second and third worlds” (Davey, 2000: 34).

This statement above refers to the transitional history of Johannesburg urban and landscape fabric. Currently the Johannesburg CBD is emerging from a period of tension, decline and abandonment hence identifying the need for a new vision of uplifting and regeneration, a new set of complex tasks establishing a National Development Plan which focuses on a sustainable growth vision for future Johannesburg has been developed. A document has been presented as the NDP (National Development Plan 2011) Vision 2030.

The vision includes the following points:
- A dynamic city that is sustainable.
- A liveable, safe, well-managed city environment.
- A city that is people-centered, and celebrates cultural diversity.
- A city for residents, workers, tourists, entrepreneurs and learners.
- A city that respects its heritage and capitalizes on its position in South Africa, Africa and the whole world.
- An inspiration global city which is viewed as a precedent of transformation.

The NDP continues by outlining various goals and focus areas which require reassessment and improvement. In summary, important inner city needs include:
- Ethical and sustainable
- Global human solidarity
- Outdoor recreation spaces
- Ecosystems
- Strategic planning
- Iconic public places
- Social facilities
- Transformative
- Increased residential density
- Opportunity focus
- A regional approach
- Phasing of development

It is with the NDP vision 2030 in mind that developments in the inner city should aim to be carried out. In a more direct response, Shaft No.2 should must also be a commentary on the NDP vision 2030, creating a catalyst for sustainable development with the surrounding urban context.
CHAPTER 2

THEORETICAL CONTEXT
The second chapter focuses on the theoretical context based on the dissertation aims and hypothesis discussed in chapter 1. The aim is to bring the theoretical context in direct dialogue with the contextual realm inspiring a creative resonance in an architectural intervention through re-scripting the third landscape, more specifically Shaft No.2.
This chapter is a search for a design approach through a theoretical understanding of re-scripting a third landscape through spatial awakening. The intention is to formulate a theory which would structure an essential understanding and guide to spacial awakening, essentially influencing the discovering of a design approach in resonance with the hypothesis and dissertation aims and visions. The aim to create an architecture which exists within an integrated urban system, rather than remaining a site of the *terrain vague*.

The theoretical content is listed below in order of scales: macro, meso and micro. Following each topic is a precedent study which comments on the theory component and scales. These scales resonate with the proposed urban and architectural intervention scales.
Fig 2.1: Concept sketch of instrument biometrics.
Michael Sorkin (2011:375) believes that there is a need to construct many radical and sustainable new cities in the near future: “There are limits to growth, and the engine of continuous economic expansion is already running up against the hard edge of the earth’s finite bearing capacity”. This statement is made in reference to current sprawling developments in America and the limit of natural resources to sustain them. The sprawling nature of these developments relies on the private motor and taxi vehicle as a primary mode of transport due to their disjointed nature.

This sprawl is also evident in the city of Johannesburg as seen in the reconstructed time line seen in the figure on page 28. The city’s horizontal consumption of land rather than its vertical growth is revealed. Through mining and
rapid urban expansion between 1886 - 1994, this metropolitan city has consumed almost all natural waterways and natural open land. The sporadic growth of Johannesburg relates to the same development trends which America has experienced. Johannesburg’s sprawl has adopted the same dysfunctional separation of uses and segregation.

The architectural production (from 1886 to present) refused to acknowledge the notion of generational transition, from apartheid planning to a land of democracy. Instead of allowing for a free interaction of elements within its landscape, Johannesburg prescribed to compartmentalize, thereby leaving vast spaces of emptiness, tension and untold narratives of its actual self (Findley 2005: 159).

The images above show how compartmentalized Johannesburg city has become. Within a 1km² region it is evident that densification occurs with individual pockets with the highest densification according in Berea. This density was achieved by large apartment blocks, many over 20 floors. This in turn created a fragmented urban landscape with little continuity of street frontage and poorly defined public realm (Burdett 2011:282).

Through the compartmentalized city planning in the 1970’s, Berea was developed as an area for white people only, this is evidence of the dysfunctional separation of users and segregation which Findley speaks about. Today this area exists as a multi-ethnic area within the city (Burdett 2011:284). One could argue the lack of inner city development was aided by the lack of development decline and investment, instead a sprawling pattern and low density urban consumption occurred, as the average density is only 1963pp/km² compared to the central density of 2203pp/km² explained in Johannesburg analysis.

In comparison with Johannesburg I have chosen Berlin. Berlin analysis shows how compact the densification is within a 1 km² region. With a lower peak density but a higher...
average density of 3737 pp/km², it is evident that growth outwards but still maintaining a vertical densification unlike the current sprawling trends in Johannesburg.

A possible solution to sprawl could be found in “smart growth” (Rowland 2006:41). The principles of smart growth are:
1. Mix land uses.
2. Take advantage of compact building design.
3. Create housing opportunities.
4. Create walk-able communities.
5. Foster distinctive, attractive communities with a strong sense of place.
6. Preserve open space, farmland, natural beauty, and critical environmental areas.
7. Strengthen and direct development toward existing communities.
8. Provide a variety of transportation choices.
9. Make development decisions predictable, fair and cost-effective.
10. Encourage community and stakeholder collaboration in development decisions.

With the current re-mining of mine dumps, there is concern about future urban consumption of these open space. With the current population expected to increase in Johannesburg from 3.8 to 4.2 million people by 2015 (Burdett, 2011: 41), these open spaces of unoccupied voids existing within the urban fabric will conceivably be consumed by current mass development sprawling trends, which is problematic in terms of future sustainable cities and does not resonate with Rowland’s concept of smart growth.

Current sprawling trends are in opposition to what Sorkin describes as a future sustainable city. Sorkin’s manifesto (2011) describes a city which works as a system, the integration of open mixed use sustainable environment where people can experience a new type of urban ecology. He writes about a self sufficient city and an all inclusive city, rather than a compartmentalised city of sprawl where land development and maximum coverage aids to a economy of supply and demand without any environmental or future development consideration.

Sorkin argues that to create a new type of urban experience there needs to be a dramatic shift in the perception of urban regeneration and sustainable cities. This is in light of Sorkin’s theory that the only cure for sprawl is to put an end to it immediately and to imagine and start to create new radical sustainable cities (Sorkin 2011:383).

Michael Sorkin (2011:383) devises his own manifesto in what he calls “Twelve Qualities for Utopian Cities”. Sorkin’s theory argues for equitable, body based, diverse cities where social interaction, accessibility and sustainability are in focus.

Nine of these qualities are relevant to this dissertation and are summarized below:

1. Strictly Neutral-The self sufficient city will find the medium of its own singularity by evolving an economy that does not simply reproduce a universal pattern of supply and demand based on the corporate invention of want.
2. Open- The open city should be a place where bounding membrane of the urban fabric is permeable to nature.
4. Diverse- Transformation of space which will allow diversity to flourish without exclusion. Its boundaries will be both flexible and creative, ecotones, not walls, places where the mingling of desires and expressions will constantly produce new ones.
5. Neighbourly - Create walkable cities.

6. Complex - The city must be filled with useful margins and edges, with human ecotones, rich sites of interaction between neighboring ecologies that permit the growth of differentiation and complexity.

7. Local - Rejecting the paradigm of the continuous sealed environment of the multinational corridor and the endless city of sprawl, a green city will engage both politics and the forms of its own particularity. Responsive to the bio-climatical particulars of place, these emergent morphologies of “green” urbanism and their unfolding will be the most dramatic and important source of the physical transformation of the city.

8. Appropriately Technologised - Appropriate technologies of sustainability will be foundational in the disposition of the elements of the city and in their particular configurations.

9. Green - Buildings will be shaped for sun and air, wastes remediation at every scale, toxins removed, propinquities engendered and shifted, fresh climaxes achieved. New urban gardens will supply us with oxygen, absorb pollution, control temperatures, provide habitat for our fellow creatures, calm our gaze and instrumentalise our autonomy.

"Johannesburg – a World Class African City of the Future – a vibrant, equitable African city, strengthened through its diversity; a city that provides real quality of life; a city that provides sustainability for all its citizens; a resilient and adaptive society."

The above is the vision statement of Johannesburg, stated in Johannesburg’s Vision 2030 IDP (Integrated Development Plan). This statement resonates with the nine principles discussed in Sorkin’s “twelve qualities for utopian cities”.

Outlined by Johannesburg’s vision 2030 IDP, the long term goal sets out new goals for the city including: reducing sprawl, creating a well defined north-south and east-west development axes, generating a well defined urban boundary, creating a green economy framework to facilitate city-wide green initiatives, spatial development framework, integrated environmental plan, enhance biodiversity conservation and protection.

The issues that I am focusing on in this thesis relates to the Johannesburg’s vision 2030 IDP, focusing on reducing the phenomenon of urban sprawl, by introducting/inserting the above nine principles mentioned. The aim is to create a functional green economy framework, mediating the gap between North and South, Creating a new gateway from the South will create rich sites of interaction between neighbouring ecologies and existing urban nodes that permit growth of differentiation and complexity. These principles will be used to envisage a regional framework for a greater urban scheme within Johannesburg. The above view resonates with Rem Koolhaas theory of strategizing the void: “Where there is nothing, everything is possible, where there is architecture, nothing is possible” (Koolhaas, 2009: 249).

Thus, in the context of Shaft No.2, I propose to re-script the site's current status of terrain vague to a site that is an epicentre of a network of meaningful interventions that increase connectivity between the city and the South, creating a new urban gateway from the South and becoming part of a greater Urban Regeneration Spatial Development Framework, encouraging city-wide green initiatives.
The Eco city was imagined as a sustainable urban extension in the city Logrono in North Spain. This 56 hector Eco city comprises of a mixed use programme, including housing, schools, social buildings, recreational facilities and a system of producing energy in a way which achieves a carbon dioxide (CO₂) neutral footprint.

Although the mixed use appropriations is no new school of thought, the fundamental part of this proposal and the relation to my thesis is the fact that there is a hierarchy of open natural space. Only 10% of 56 hectares will be consumed by buildings. The remaining space becomes an Ecological park, a mix of landscape and energy consumption (Farelly 2011:148). This project highlights the important of appropriating space through landscape, not through the current...
trend of sprawl which Johannesburg has been subjected too. Although this ambitions proposal might seem to be the utopian ideal, the principles behind the Eco City are in light of the fundamental principals of smart growth described by Rowland (page 29).

This project has attempted to densify a site and create an environmental urban park that complements the density in a way which encourages mixed use and healthy living.

Architecturally, the linear shaped development divides the natural environment in half and it resembles an architectural wall or barrier. This layout is not conducive to create smaller community pockets within the Eco city.

Although the linear profile is not the ultimate arrangement for housing, the project has managed to create a total of 3 000 units as well other amenities within 5.6 hectares, which is 10% of the 56 hectare site (The eco city 2011). In terms of maximum densification and urban sprawl, this may seem like an unfeasable amount of coverage, but in terms of new radical cities which relate to Sorkin’s principles of Utopian cities (page 29) the Eco City would seem to be a essential way of developing green sustainable city systems.
Shaft No.2 acquires the notion of a ‘non place’—neither part of the city fabric nor part of the suburban context to the south. This man-made landscape has become locked within its own time, disconnected from urban and city densification, thus creating a space which is governed by its own rules of time and nature.

Through my investigation into the specific site condition of Shaft No.2, I refer to the terms of Terroir and Terrain Vague. In order to relate the significance of these terms within this document to Shaft No.2 they have been dissected below:

The term associated with the phenomenon of landscape or site specific conditions is terroir. Landscapes and their terroirs are products of sequences of earth processes that date from the beginning of the geological record to present day. “Landscapes are shaped by their geological histories and may acquire terroir determining features during the evolution of the landscape” (Haynes 1999: 190). The specific site conditions of this non place exist in a tension between man versus. nature. A synthetic site made up of partially natural ground conditions and the synthetic man made geological conditions. The man made landscapes are a result of a mining era which changed the landscape and original genius loci.

Terroir resembles Tim Ingold’s theorization of “landscape” (Ingold 2000: 195) as it offers a theory of how people and place, cultural traditional and landscape ecology are mutually constituted over time. Since terroir responds to the geology of the site, the physical qualities of Shaft No.2 relate to the term terrain vague.
The term *terrain* in English has come to signify more natural territory with agricultural or geological qualities (Morales 1995:125). This is perhaps significant in making a connection between urban territories which move and develop in a manner similar to the process and qualities of natural territories.

*Vague* is a French term which has its origins in German and in Latin. The German word *woge* refers to a sea swell and suggests qualities of motion, fluctuation, oscillation and flow. The French word *vague* has two Latin roots, namely *vacuus* and *vagus*. For the purpose of this paper only the first root, *vacuus* meaning ‘vacuum’ or ‘vacant’ in English, will be explained. This describes physical qualities of emptiness and the unoccupied, but also refers to that which is ‘free, available or un-engaged’. These last three attributes allude to a hidden potentiality in this physical space (an expectation of motion). Thus these terms characterise the forms of absence.

This in-between space/void amid the mine dumps, as previously described, lacks any form of scripted activity, it is space without a deterministic order which aligns itself to the effective city. It is a space internal to an urban fabric, yet outside the flows of everyday use by the general public.

Ignasi de Sola-Morales writes that, “The relationship between the absence of use, of activity, and the senses of freedom, of expectancy, is fundamental to understanding the evocative potential of the city’s *terrains vagues*” (Morales 1995:120). By understanding the arrangement of the different phenomena, one is able to determine environmental quality and spatial atmosphere in relation to time and historical events.

Within this dissertation there will be a process to analyse the *genius loci* (spirit/character) of place through understanding the structure and arrangement of the different site specific layers. This will be done through a series of mapping exercises, tracing the site and unpacking the layers and connections that exist.

I propose through the phenomenology of space and architecture, regardless of programme or function, inevitably creates a new place. This responds to Davids Seamon’s theory of ‘Place = meaning + space’ (Seamon 1976: 64).

Place is closely related to space, as these two concepts rely on each other. As Menin argues “it is the experience of place, the feeling of place, and its origins, since place is the most unique experience of space (Menin 2003:1)”.

In context to Johannesburg, a recent inner city regeneration attempt come to mind. The Maboneng precinct is an urban regeneration initiative, focusing on breathing a new life into the city by re-scripting the previous derelict and unused industrial buildings, creating a safe vibrant mixed use space. Although earlier attempts have been made to develop the precinct, this reintegrated node exists in isolation and in contradiction. It has no direct connection with the surrounding context. Maboneng precinct reflects Day’s comment that “space is where we feel safe and enclosed, regardless of the edge outside. The edge refers to the threshold as one enters or leaves a space, the borderline between space and place. We need to be able to situate place in space for it to exist, for if we cannot do so, it remains meaningless” (Day 2002: 121).

In the opinion of the author, The Maboneng inner city regeneration has created a space, but has failed to situate it in a place, thus has only created a meaning for its direct users and client interaction.
Consequently it is important that place not only generates the architecture but the architecture activates space. Both space and architecture should depend on each other to create place. It is outside these bounds of scripted space territories in ambiguous space that new meaningful appropriations of space can be generated.

Fig 2.5 - Site of terrain vague (Photograph by L. Krige)
Duisburg Nord's located in the Ruhr region of Germany. Before the Industrial Revolution of the middle 19th century this land contained a pallet of indigenous natural and agricultural land. In 1901 Duisburg Nord was transformed into a powerful industrial landscape, the main function being the production of steel for the growing German steel industry. An industrial steel blast furnace and factory was erected and grew to over 220 hectares until 1985 the plant closed down due to international changes in steel manufacturing (Diedrich 1999:72).

Due to the closure and the industrial nature of the steel factory, this land lay abandoned and isolated. It became an area that suffered from extreme social, economic and ecological decline for a number of decades (Diedrich 1999:88).

Landscape Park - Peter Latz
Duisburg Nord
Metamorphosis of the blast furnace plant Thyssen-Meiderich into a landscape park

Fig 2.6 > Photograph of Landscape Park (Latz + Partner 2007).
The Peter Latz’s design attempted to preserve as much of the existing site as possible (Diedrich 1999:68). Latz recognized the value of the site’s current condition. He allowed the polluted soils to remain in place and be remediated through phytoremediation, this is the process where the use of specific plants and their associated microorganisms stabilize and reduce contaminations in soils, sledge, sediments and ground water (Using Phytoremediation to Clean Up Sites 2012). He also found new uses for many old structures and turned the former sewage canal into a method of cleansing the site (Weilacher 2008:106).

The idea was to integrate, shape, develop and interlink the existing patterns that were formed by its previous industrial use, and to find a new interpretation with a new syntax. Latz claims that interrelations must be made concrete and visible and that the viewer/observer will create their own picture of place, not the designer. The existing fragments were to be interlaced into a new “landscape” (Latz 1994:96). In the landscape park Duisburg Nord, individual systems operate independently. They connect only at certain points through specific visual, functional or merely imaginary linking elements. These layers are the deep level water park, the single fields and clumps of vegetation, the promenades at street level, which connect parts of the town having been separated for decade.

Duisburg Nord’s conditions can be compared to early Johannesburg’s mining era, although Johannesburg wasn’t manufacturing steel. Gold mining became the economic backbone, making Johannesburg a strong economic hub. With the decline of mining within Johannesburg, the man-made landscapes of mining residue which contain a level of pollution still remain to this day. There is a commentary between Duisburg Nord landscape and the mine dump archipelago’s which exist in Johannesburg. While Duisburg Nord faced extreme social, economic and ecological decline, Johannesburg mining belt still experiences it due to the lack of development or urban regeneration.

In the context of Shaft No. 2, the water park could be interpreted as Wemmer Pan, the single fields and clumps of vegetation would resemble the existing flower and farmers market, the promenade at street level is the North South arterial which would attempt to connect
the fragmented city creating new opportunities for urban growth and development also reconnecting public attraction which has been isolated or forgotten, for example: the transport museum, musical fountains at Wemmer Pan, Santarama Mini Land and Turffontein Track.

Fig 2.7 > Photograph of Landscape park (Latz + Partner 2007).

Fig 2.8 > Areal of nature within the industrial ruins (Latz.

Fig 2.9 > Water landscape and constructed wetland (Latz + Partner 2007).

Fig 2.10 > Vegetation which grows amongst the existing structures (Latz + Partner 2007).

Fig 2.11 > Public interaction and users of the park (Latz + Partner 2007).
Fig 2 > Photograph of Landscape Park (source: xxxxx).

Note > The entire industrial site has been redesigned, synthesizing with man, machine and nature.
SPATIAL AWAKENING -

Architecture of a terrain vague

“Places, like people, can be traumatized, but like humans they can recover from their negative experiences, albeit with their characteristics altered” (Menin 2003:90). In this world, architecture must be able to evolve like its human counterpart in a struggle for survival and relevance. Architecture should be designed in a way which is easily adapted to change, of programme or function. The adaptability of architecture is important to remain relevant in economic and environmental flux. Architecture needs to adopt a notion of adaptability and flexibility if it is to truly succeed in this world of continuous flux, this is also according to Norberg-Shultz who believes that the structure of a place is not a fixed eternal state (Norberg Shultz 1976:422).

By focusing on integrated architecture, I propose spatial awakening by means of an architectural intervention which is influenced through the concept of terroir and this landscape of the terrain vague. The aim of this dissertation is to re-activate this landscape which lacks scripted activity.

For this to happen the architectural intervention needs the entire landscape to be embraced as a generator for functional architecture. Thus it is important to use the site’s potential which exists outside the bounds of scripted territories. It is within these ambiguous spaces that a creative and new appropriation of space can be generated. To reiterate, these appropriations of space are not being subjected to the normal school of thought which implies mass densification (urban sprawl) but rather an urban landscape that resembles the nine
principles discussed in the previous chapter. I propose that architecture must be designed around nature, incorporating nature within this contrasting element and allowing nature to influence function. Thus creates a synthesis between architecture and nature.

This notion is absent within the current condition of Johannesburg, resulting in a concrete jungle rather than an ecological sustainable city system. For this synthesis to exist, the architecture must engage the site in order to make the site present to the body; it must physically and metaphysically explain and reflect the concept of site through observation and use.

Spatial awakening cannot exist in a permanent state of a built structure. Theorist Uexkull (2009: 147) believes space in cities has become autonomous as have the objects with it. If we base ourself in permanent unadaptable structures we have disrupted our experience of space, as space would then be stagnant, unable to change or be flexible in relation to needs or experience. The architecture integrated into Shaft No.2 should not replace nature but rather synchronises with it. "The building replaces the land. That is architecture’s original sin" (Betsky 2002:5). I am in agreement with the above statement by Betsky, focusing on architecture which acts as a system of exchange between architecture, nature and man, the amalgamation of contrasting systems aims to create a symbioses.

Instead of acting as a complacent accessory, architecture may direct energies towards something constructive. It can therefore assume a stance not only in shaping a new sustainable culture, but help produce it through a process of system exchange (refer to page 10).

The aim is to generate a programme of the site through a phasing process of renewal and replacement. The initial architectural insertion should aid in the collection and facilitating of knowledge for the development of a integrated urban system, thus the programme associated with remediation aims to inspire further urban development on a meso scale around shaft No.2. Essentially, the building becomes a heuristic vehicle for discovery. The programme associated with an architectural intervention at Shaft No.2 is intended to be a combination of public and private, with emphasis placed on public experience and interaction with the architecture and landscape.

The intention is to create public involvement through observation and engagement. The users, public and private involvement becomes a journey of discovery through an architecture which is articulated and engages with the site and remediation of Shaft No.2. Consequently the programme is layered onto the site, maintaining its current characteristics nature, re-scripting the site into the current and proposed urban context through architecture, experience and awareness, rather than assimilating residual space with the production of sprawl.
The Eden Project was built in a 160-year-old exhausted china clay quarry near St Austell, in Cornwall. Cornwall was periodontally a mining area and was left as a whole in the ground when the mine had reached its life span (Eden Project 2012).

The Eden Project is a showcase for global biodiversity. It is the largest plant enclosure in the world and represents a precedent for environmental improvements and land remediation of defunct mining lands.

The process in which the environmental regeneration started was with the help from Reading University, as they were able to make over 83,000 tonnes of fertile soil hence, the mineral component came from local mine wastes: sand and clay from various mining...
compounds in the area (Eden Project 2012). The ingredients were mixed with a together and the added earth worms helped dig and fertilise the new earth. “Our soils help to show that environmental regeneration is possible” (Eden Project 2012).

Although the Eden Project displays the possibilities of ecological and land remediation, it also has a socio ecological exchange between nature, architecture and people.

The project supports social inclusion, the outreach projects are designed to offer memorable experiences and vital life skills to those who are socially excluded, including prisoners, the homeless, the disabled and the unemployed.

There is a People and Learning Exchange at Eden, which aims to inspire people to go on a journey of discovery, to learn through interaction. Edens believes “In a changing world, we need imagination and enterprise; we need to foster our skills and talents; we need communities to get engaged in inventing new, more sustainable ways of living together” (People and Learning 2012).

The Eden regeneration programme extends across the globe. The programme doesn’t only benefit the local environment but act as a focus for regional, social and economic regeneration.

Eden also displays support with art, creativity and music. Year round they offer a rich programme of events from music festivals to exhibitions, these activities are held at Eden, which in turn engage people in nature and the environment, creating awareness through social interaction. The Eden Project epitomises the power of regeneration to transform environments and improve people’s lives.

In the end the Eden Project created a global garden in a former clay mine to create a world class attraction that has helped to boost tourism in the region, but also to create a socio ecological urban system which can be adopted and implemented to create sustainable living.

This project displays a creative resonance of the above theoretical discourse, through architecture and nature, land remediation has helped create a socio ecological system.

Shaft No.2 experiences similar urban conditions before the Eden project started, and resonates
with the dissertations aims and practical aims discussed in chapter 1.

Although the Eden project grew plants in the on site greenhouse as well as housing the ecological facilities for remediation, within the context of Shaft No.2 on a meso scale, that same system can be applied. The ecological facilities responsible for tracing and recording the landscape and environment can be based at Shaft No.2, while the cultivating of plants and agriculture can exist as an extension of the Johannesburg Flower Market and the Fresh Produce Market which exist to the west of Shaft No.2. This will be taken into consideration when developing an urban proposal.
Fig 2.18: Photograph of the Eden Project in a fully remediated state (McLeod, 2008).
The significance of the architecture doesn’t only lie in the shape and form, but also investigates a function which becomes a platform for exchange and knowledge. Exploring its’ influence within a context by amalgamating contrasting systems to create a systemic socio-urban ecology, one could argue that the architecture contains knowledge and a facilitating function.

The design is taken from the aspects and precedents that contribute to the making of place through spatial awakening of the terrain vague. By re-scripting the third landscape through the production of a new urban experience, phenomenon of landscape and spatial awakening , and finally an architecture of the terrain vague would assist and contribute to constructive place making, assisting in shaping the future of Shaft No.2 and its urban context.
This section focuses on the analysis of three major scales of intervention: macro, meso and micro. The analysis attempts to uncover and reveal the characteristics of the terrain vague through the understanding of the concept of terroir. This interpretation of the study site then served as a base off which the design could begin to conceptualise.
“For when the same space is forced to comprise multiple spatial contents, revealing their inherent conflicts and contradictions through layering, transparency, translucency, morphing, and transposition, then the result is not so much a denial of the real but a projection of a new real” (Richter 2001: 16).

The “new real” to which Richter refers exists in the flow and force of an environment, a network of energy that exists.

To understand the urban fabric surrounding Shaft No.2, one is required to study the context area thoroughly through on-site mapping, photographs and contextual mapping to produce a manifesto of the information discovered. The representation or mapping of the site exists as an interpretation, a collective of information aquired, a basis of information in which a urban response can resonate.

This map then becomes the ‘new real’ described by Richter.
Fig 3.1 > Photograph showing existing concrete head-gear footings.
<Fig 3.2: Drawing of the Johannesburg in its regional context.
Shaft No. 2.

< Fig 3.3: Aerial of a macro scale, illustrating the mine dump archipelago's (Google Earth 2019).
This reconstructed time line analysis attempts to uncover/reveal Shaft No.2’s geological history in relation to a developing city. Restating the concept of terroir, it implies that landscapes are products of sequences of earth processes that date from the beginning of the geological record to the present day, thus landscapes are shaped by their geological histories.

This study set out to prove Shaft No.2 is a site or terroir based on Tims Ingold’s theory of Landscapes (as mentioned on page 33). This time line is relevant for the decisions made for the design, programme discovery and possible future projection.
A landscape boasting nature's reclamation, a remediation state of biodiversity has evolved.

With the re-mining being an active activity, a new school of thought need to be adopted in appropriating these new landscapes.
My instinctive attraction to the site springs from the ability to straddle worlds, worlds of the unknown (the abandoned underground mine tunnels), the existing and the unexpected, in other words the past, present and future. This is compounded by its seeming remoteness caused by the lack of scripted activity and connection to its surrounding urban context, and memorial type nature because of the mine shaft footings that exist in isolation within this site of *terrain vague*. These footings resemble a remembrance of how Johannesburg became into being.

This site acquires the notion of a 'non place' - neither part of the city fabric nor part of the suburban *terrain* to the south. The synthetic landscape has become locked within its own time, disconnecting itself from urban and city
densification, thus creating a space which is governed by its own rules of time and nature.

The consideration of place making was an instinctive notion, due to its character and its location between to the city to the North and Wemmer Pan to the south.

*The presence of architecture - regardless of its self-contained character - inevitably creates a new landscape. This implies the necessity of discovering the architecture which the site itself is seeking*”


This above statement is an important consideration in the development of this site.
Fig 3.5: Photograph looking North into site.

Note: The intensity of the natural vegetation has consumed this part of the synthetic site.

Fig 3.6: CAD drawings illustrating the site's typography and vegetation in relation to Shaft No.2.
In order to fully understand the relationship between built fabric and the current mining belt, a macro analysis was conducted. This analysis revealed the vast network of mine dumps which span East to West. It also reveals the amount of potential future development sites due to the current remining trend.

Through the regeneration of the archipelagos of Shaft No.2, there is an opportunity to bridge the gap between the North and South (city and suburban). This analysis will aim to reveal and highlight existing and proposed connections, important nodes and growth within a macro context, thus possibly creating a new gateway to the city from the south.
2.1 Existing major transport routes -

Shaft No.2 is situated along Wemmer Pan Road, it is one of the main vehicular transport arterials running from South to North and vice versa, creating a direct link into the city. Elevated is the M2 National highway which connects the city from East to West. There is an on-ramp and off-ramp that connects the M2 to Wemmer Pan Road via Rissik Street off-ramp and on-ramp, this creates an easy vehicular connection to and around my site.

Transport via train is also in close proximity of Shaft No.2. From Park Station there is a route that continues to Booyens and Village Deep train stops. The two stops are situated in close proximity to the main vehicular arterials, creating a loop system of existing transport around the Shaft No.2 precinct.
Shaft No2.
Existing transport nodes:

- A - Park station
- B - Faraday taxi rank
- C - Village Deep train stop
- D - Booyens train stop
- E - Rossenterville bus stop
- F - Kaserne West train stop

Transport nodes in relation to Shaft No.2:

- Public transport nodes
- Train stops

Travel times:

**Train**
- A - F = 16 min
- F - D = 4 min
- D - C = 1 min

**Vehicular**
- A - Shaft No.2 = 11 min
- B - Shaft No.2 = 1 min
- C - Shaft No.2 = 6 min
- D - Shaft No.2 = 6 min
- E - Shaft No.2 = 4 min

Shaft No.2 - Wemmer Pan = 2 min

**Pedestrian**
- A - Shaft No.2 = 51 min
- B - Shaft No.2 = 8 min
- C - Shaft No.2 = 10 min
- D - Shaft No.2 = 30 min
- E - Shaft No.2 = 30 min

Shaft No.2 - Wemmer Pan = 18 min
Fig 3.9: Aerial of a macro scale, illustrating the existing transport nodes. (Google Earth 2013).
Existing urban nodes -

1. Park station
2. Farraday taxi rank
3. Shaft No.2
4. Village Deep train stop
5. Booyens train stop
6. Rossentenville bus stop
7. Kaserne West train stop
8. Shaft No 2
9. Wemmer Pan
10. Hector Norris Park
11. Transport Museum
12. Rand Stadium
13. Turfontein Race track
14. Fresh produce market
15. Flower market

Radius Distance in relation to Shaft No.2

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</tbody>
</table>

Shaft No 2. - Wemmer Pan = 1.3 km
Fig 3.10: Aerial of a macro scale, illustrating the existing urban nodes (Google Earth 2013).
A meso analysis was undertaken in order to understand the site within the larger meso context. Through site visits and observations it is evident there is no obvious interaction or relationship from neighbouring context in which it is located.

The aim of the meso analysis was to get a better understand of the surrounding context, through unpacking this site in a series of context analyses, urban nodes and possible urban development corridors. This information will be used as a basis in creating urban connections between Shaft No.2 and its context.
Fig 3.11 > Site aerial with existing urban activity nodes overlayed (Google Earth 2013).

Note > This mapping expresses the concept of terrain vague, note how Shaft No. 2 sits unconnected and in isolation from the everyday urban and city functions which exist around it.
One obvious activity is the re-mining of existing mine dump which sits between Shaft No.2 and Wemmer Pan. The re-processing will remove the entire dump, leaving behind baron sand and a void within the urban landscape, in turn allowing for the site to be occupied. I intend to use this open land as a connection for public and pedestrians between Shaft No.2 and Wemmer Pan.
< Fig 3.12: Photograph illustrating the mine dump being processed. 

Note > Voids from the mass are the only remains of the mine dump.
Fig 3.14 > Images showing the re-mining of the existing mine dumps at Shaft No.2. (Google Earth 2013). Note: Increased mining intensity from period 2011-2013.
Fig 3.13 > Site aerial showing the mine dump removal process (Google Earth 2013).
3.2 Context analysis -
Fig 3.15 > Shaft No.2 showing urban context.
Natural remediation has accorded on some of the existing mine dumps. There was an initial planting strategy that was implemented to retain the dust from blowing into the city, today the natural process of remediation has covered a vast area of re-mined dumps and existing dumps.

Archipelagos

Within the meso context exists a network of archipelagos. These man made landscapes consume more land than built fabric, they also have created a non development barrier between the North and South. One dump has been completely removed and a second is in progress. With the removal of these dumps, a possible urban corridor can exist between North and South.
The public space identified exists on the edge of a residential area. The public space consists of Pioneer Park, which has sport facilities such as soccer fields, Wemmer Pan and the Hector Norris Park which also contains sports fields and a BMX track. As one moves towards the city, open public space seems to get less with the urban fabric transforming into an industrial zoned area coupled with existing mine dumps.

Within the open public space network, there is a sub-network of semi-private space, which would include the rowing club, Santarama Mini Land, James Hall Transport museum, the swimming club, Rand Stadium and Turffontein Race track. All these function welcome public, but only on a membership, small fee or event-based exchange.
This precinct is serviced by two main modes of transport, vehicular and railway infrastructure. The Wemmer Pan road is the main North South arterial, while the M2 connects the East and West. The railway line also runs East West and has been carved out of the landscape. Transport networks surround Shaft No.2, allowing easy accessibility.

The figure ground illustrates the urban infill, this is recognisable due to the lack of a structured grid or any coherent planing. Due to the compartmentalized nature of Johannesburg discussed (page 19), urban sprawl consumed these left over spaces, resulting in the infill urban fabric which exists today.
Through this layering analysis, it becomes evident that Shaft No.2 is a site or terrain vague. Small pockets of public space exist to the South, while to the North Shaft No.2 is met by a hard industrial edge. The mine dumps create an obvious obstruction within the urban fabric. The figure ground illustrates the urban infill due to the lack of a structured grid or any coherent planning.
To fully understand the context of Shaft No.2, a zoning analysis was undertaken. With the majority of the urban context being zoned as industrial and residential, there are also small pockets of commercial zones. Shaft No.2, Wemmer Pan, Pioneer Park and the vacant land in front of the Johannesburg Flower Market do not have a zoning function allocated. This further proves that Shaft No. 2 is a site of terrain vague.

Industrial 1 under the zoning restrictions allows for residential, mixed, commercial and business functions to exist. This is a very important factor as in terms of the urban design proposals, as this allows for urban regeneration of the precinct to resonate with Sorkin’s urban principles (page 27) on a existing governmental regulations.
Fig 3.24: Government Zoning plan of Shaft No.2 context (GIS online maps).

Fig 3.25: Aerial of a macro scale, illustrating the existing zones (Google Earth 2013).
Shaft No2 unique position requires a general familiarization of basic site analysis. Basic site conditions form an initial design generator. Using natural site conditions is fundamental to design a site responsive intervention.
Fig 3.27 > Panoramic image indicating possible 1st development corridor in context
Fig 3.28 > Early concept sketch of intervention within the context of Shaft No.2 and surrounding urban fabric
Fig 3.29  Early sketch of Shaft No.2 context analysis
The micro analysis attempts to uncover or reveal Shaft No.2's inherent conditions and character, which can be missed if observed from a distance. These layers need to be understood, interpreted and made visible for the future constitution of this land, thus I argue a building modifies its environment and the environment modifies the building. This analysis is conducted through the concept of terroir, explained in Chapter 2.
Fig 3.31 > CAD Plan illustrating the sub terrain site conditions, traced from The General Underground Plan.

Note > There is an extensive web of mine tunnels under shaft No 2. The intention is to utilize some of these abandoned tunnels (Author 2013).
The Central Underground Plan shows the complexity of the underground tunnel network which exists below the mining belt. Indicated on this complex diagrams, shows 22 levels of horizontal mine tunnels, for the purpose of this thesis I have only redrawn the first and 2nd level (refer to previous image).
Shaft No.2

Fig 3.33: Zoomed portion of the existing Underground mine tunnel network (courtesy of Shango).
4.1 Photographic site study-

This study is concluded in order to establish a visual understanding of the natural and synthetic characteristics of Shaft No.2. The natural regeneration regions supreme in the tension between natural and synthetic and should be expressed to form a connection with the proposed architecture.

Fig 3.33 > CAD Site plan showing positions of camera views. nts
Fig 3.34> Photograph looking from Wemmer Pan Road into the site

Note > The existing concrete footings of Shaft no. 2 and brick wall surrounding the entrance to the shaft on the right hand side of the image.

Fig 3.35> Photograph looking North

Note > This part of the site has the most natural vegetation, due to the perennial stream which exists to the North of the site.

Fig 3.36> Existing natural vegetation on site
Fig 3.37: Photograph illustrating the visual connection between the site and the city (photograph by Leon Krige).

Note: The noise level associated to this part of the site is only 1 db.
Fig 3.38> Photograph illustrating the current mine dump removal and reprocessing directly adjacent to Shaft No.2
The only structure which exists on the site is the mine shaft and the concrete footings. Once, these concrete footings supported the steel headgear which was seen as iconic structures of the economic wealth that formed Johannesburg. Today the headgear has been removed leaving these concrete footings to exist in isolation within the context of the site.

These concrete footings visually relate to a history of mining and a reminder of the site condition before this landscape was re-scripted. I intend to leave them intact, incorporating them into the overall design of Shaft No.2. The vertical shaft and its depth underground present an opportunity to be used for geothermal power, this will be taken into consideration in terms of design technology.
Fig 3.40: Photograph illustrating the open vertical shaft at Shaft No 2
Fig 3.41: Sketch indicating Shaft No.2 and concrete footings.
Fig 3.42: Photograph of the existing concrete footings left at Shaft no.2.
Geological analysis-

Shaft No.2's unique position requires a general site analysis. Basic site condition forms an initial design generator. Using Natural site conditions is fundamental to design a site responsive intervention.
Currently the hydrological run offs and catchment areas happen on the lowest part of the site, which is the valley caused by the two mine dumps. Through the studying of the vegetation density on site, it becomes clear that the central valley currently acts as a natural accumulation point, as this is where the vegetation is most prominent and dense and supports a range of wild life (plants, insects, guinea-fowl, hare’s and a range of bird life).

SHAFT No 2

SITE HYDROLOGY
Shaft No.2 is located between two mine dumps, therefore hydrological activity influences a design of sustainability. Understand the water run off and catchment areas allows for a design which the water could be used in the design process. Since this water contains a certain level of toxicity (heavy metals), the water run off could be used for a geothermal plant, ensuring a energy source which doesn’t rely on the city grid.
Because Shaft No 2 lacks any scripted activity which forms part of Johannesburg’s city rhythm, the site is subjected to unique and personal experience. The site forces one to discover, creating their own route of discovery and observation. Through the discovery of the site, this route proved to be the most exhilarating, heightening the visual senses of the site and urban surroundings.
The topography of Shaft No.2 allows for multiple visual and sensory experiences, with different sight views changing from every angle, revealing different element of this surreal site. The unexpected site allows for emphasis on particular line of site, connecting the user with the site and the city.

Because of the location of Shaft No.2, the acoustic quality allows for a heightened sensory awareness. Sounds of the City get amplified as well dissipate. The senses are in constant flux responding to different elements as one moves through the site.
Interpretative analysis-
“To understand the potential of these mixtures, one has to create mechanisms that connect them to local sites and structures, after understanding these with rigorous fieldwork and observation” (Bunschoten 1998: 7).

In producing a final map of the forces inherent in the study area, all of the previous mapping exercises are overlayed to communicate the complex level of natural systems and networks which would have previously gone unseen. In this map the meaning of the individual lines is removed and de-contextualised. The final result is thus an expression of complex systems between the geological forces on site and sensory perceptions. It is a base for the evolution of the design, a unique, site specific reading, an ‘after image’ of a terrain vague.
In an attempt to enhance the experiential and physical intensity of the Shaft No.2, it is important to assess which points to intervene without disrupting the existing nature on this already disrupted terrain. The aim is to enhance the ecological status that exists on the site, the architectural intervention should provide infrastructure which provokes the sites potential in a new re-awakened space of ecology and landscape. These points are areas where an architectural element, a programmatic change or an urban reconfiguration can rewire the existing forces, redirecting or enhancing the network, creating a more dynamic, extended and more sustainable urban and site experience.
Fig 3.53: Site photograph with experiential mapping overlayed.
Site boundary analysis -

The eastern site boundary of Shaft No.2 is separated from the street front by a series of natural and man made barriers (mine dumps), concealing parts of the site, only allowing glimpses in certain places and at times revealing the entire site with no obstructions. These natural and man made barriers (mine dumps) vary across the eastern edge of the site, allowing access at one point.

This analysis is useful when designing the main entrance that allows for visual interaction from the street as well as defining the entrance to the site.

Fig 3.54> Site map showing site sections.
Fig 3.55: Site boundary sections

Boundary section 1
PUBLIC ROAD → PEDESTRIAN → MINE DUMP

Boundary section 2
PUBLIC ROAD → PEDESTRIAN

Boundary section 3
PUBLIC ROAD → PEDESTRIAN → NATURAL GROUND LEVEL

Boundary section 4
PUBLIC ROAD → PEDESTRIAN → NATURAL VEGETATION → MINE DUMP
CHAPTER

4

BRIEF AND PROGRAMME
This chapter concludes the content explored in the previous chapters and formulates a brief in the aim to re-script the third landscape through an architecture of the terrain vague. Programme overview, clients and role players are also identified and discussed.
1.1 Brief -

Through the theoretical discourse and the site and context analysis, a comprehension or understanding of Shaft No.2, its context and its condition *terrain vague* and third landscape became evident.

The NDP and the IDP together with theoretical studies are used to formulate a brief. The brief will be a response to the previous chapters in three scales of intervention, Macro urban, meso urban and architectural intervention.

Fig 4.1> Diagram showing the formulation of brief and focus area.
The Macro urban brief concentrates on connecting fragmented urban nodes into a systemic urban ecology. This would resonate with Sorkin’s principles (page 30).

The macro brief consists of:

- Creating systemic urban integration
- Sustainable urban regeneration.
- Formulating new and improved public transport and pedestrian routes.
- Increase sustainable mixed used development.
- Promote a hierarchy of green public spaces and open networks.

The Meso urban Brief intervenes in the immediate context of Shaft No.2. Focusing on the North south link Between the South and JHB city, essentially creating a new gateway into the city.

The meso brief consists of:

- Creating a green link from Farrady to Wemmer Pan.
- Upgrading and implementing pedestrianised links to public transport nodes (railway and bus/taxi).
- Upgrade of existing open space public facilities.
- Create a sustainable walkable landscape environment.

The architectural brief calls for a hybrid design solution where man, nature and architecture are merged to compile a building which functions as an instrumentive platform to focus primarily on land remediation, ecology and environment.

The architectural intervention brief is:

- Providing a facility for observation that will contribute to obtaining knowledge about current third landscapes and environmental sciences.
- Creating spatial awaking through sustainable architecture and re-script the third landscape.
- A facility to promote the understanding of environmental awareness and sustainability.
- Aims to contribute as a catalyst for land re-mediation landscape development.
- The architecture should be an instrument which visually and tectonically traces and records the effects on our environment,
- Increase natural ecology by providing infrastructure for natural ecology generation.
- Provide public and private facilities which integrate, allowing the public to be a part of the private with and disruption.
- Promote public participation and interaction.
- The architecture must incorporate nature, allowing for nature to amalgamate with the architecture, becoming a soft extension of landscape.
- Have sustainable technologies and services that render the structure self sufficient. These technologies must test new boundaries and be visible to the public and users, becoming part of the experience and interaction of the building.
The following architectural programme was concluded from the brief.

An Ecological Observatory and Landscape Park:
This facility will include the following:

-Ecohydrology laboratory:
The Ecohydrology laboratory will house all the needs of a small scale laboratory to rest and research ecohydrology, which is the study ecosystems which are in contact and develop in or near a body of water. This is an open space work and testing area, studies also extend into the fauna and flora floodscape.

-Botany laboratory:
The Botany lab will house all the needs of a small scale laboratory to test and research plants and phytoremediation in existing geological and environmental conditions. This study is hugely important for land remediation through landscape. This is an open space work and testing area, studies also extend into the landscape.

-Environmental sciences laboratory:
The Environmental science laboratory will house all the needs of a small scale laboratory to and research and record fluxuations of environmental and climatic conditions. This is an open space work area, with the architecture being an extension of technologies which trace and record natural forces acting against the site.

-Environmental administration and storage:
Offices will be provided for the laboratory technician and engineer, as well as visiting/teaching laboratory, administration facilities and staff room and equipment storage.

-Fauna and flora flood scape (wetland): The fauna and flora flood scape provides infrastructure for fauna and flora to inhabit the site, promoting natural remediation and ecological diversity.

-Sample collection, sorting and storage: This space will house test samples under constant temperature,

-Exhibition space for public interaction and participation: The exhibition area will house various exhibitions concerning environmental remediation, ecologies, and the environment. Display board, cases, natural open courtyards and terrariums will be exhibited, resulting in an interactive space of knowledge. The exhibition area also ads to the experience and discovery as one moves through the architecture.

-Recording and data storage: This space will house all data and informations gathered. This ark of knowledge will be placed on an open source network for open source sharing.

-Aeolian harp: The Aeolian harp doubles as a tracing and recoding device of wind speed and direction. These recordings are an important aspect in terms of the climatic science observatory. The recordings of the Aeolian harp are traced and stored and can be then be mapped over a period of time, indicating fluctuation within our environment.

-Eco walkways: The Eco walks are a set of routes which guide visitors and public through the building and into the landscape. The eco walk network aims to increase the experiential quality of Shaft No.2, including the public realm in the process of land remediation and environmental awareness. The eco routes will tie into the urban pedestrian links, creating a interconnected pedestrian system between the city and Shaft No.2.
Two major clients are identified in terms of project feasibility and relevance, namely Neon and Gauteng Government.

The first client is Neon. Neon, which stand for National Ecological Network, is currently looking to expand there network to a broader global context. The purpose of Neon is to enable understanding and forecasting of the impacts of climate change, land use change and invasive species on continental ecology, by providing infrastructure and consistent methodologies to support research and education. Shaft No. 2 and the precinct around it, is one of the many ideal places for Neon to expand to, thus aiding in the remediation of Shaft No.2, creating a new urban ecology which synthesizes man, nature and architecture.

The second client in terms of local funding would be the Gauteng Government. This project would highlight there environmental and sustainable commitment enforcing them as major role players and investors in the process of rehabilitating land for the development of public use. This is in light of NDP Vision 2030, which calls for a upgraded green environmental city projection discussed on page 21. The project would be funded in varying degrees by all three spheres of government:

Local government-
The City of Johannesburg, The Johannesburg Development Agency (JDA) and Johannesburg City Parks would be the primary funders.
Provincial government-
The Provincial Heritage Resources Authority Gauteng (PHRAG) would also have an interest as mining (and its broader societal impact) is intrinsically linked to the perceived cultural identity of Johannesburg.

National Government-
A collaborative push by the Department of Environmental Affairs and the National Heritage Council would give the project political and financial impetus needed to realise the project.

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**Fig 4.3**> Clients and role players

**Fig 4.4**> Government, client and public interrelationship.

**Fig 4.5**> Diagram showing government, client and public interaction.
Project timeline:

MACRO URBAN FRAMEWORK

MESO URBAN FRAMEWORK

ARCHITECTURE (THESIS)

Smart growth
Urban regeneration
Land remediation
Public transport connections and nodes
Systemic urban integration
Sustainable development
Public infrastructure

Urban Pedestrian link from Farraday to Shaft No. 2
Proposed green landscape park link to Wemmer Pan precinct.
Current mine dump removal and proposed land remediation for urban link.
Flower Market extension IDP proposal—Local Government.
Johannesburg Market 2 phase development.
Pedestrian connection to transport and urban nodes.

Proposed Ecological Observatories and ecological landscape park.
ARCHITECTURE
PHASE 1
COMPLETION

MESO URBAN FRAMEWORK

MACRO URBAN FRAMEWORK

Fig 4.6 Time-line
CHAPTER 5

URBAN
This chapter proposes a macro, meso and site urban framework. These frameworks are based on the brief, theoretical reach as well as the site and context mapping.
EXISTING FRAMEWORKS

1. Flower Market IDP 2 phase expansion
   (Integrated Master Plan for the Joburg Market 2012)

2. Fresh Produce integrated master plan
   (Integrated Master Plan for the Joburg Market 2012)

3. Pioneer Park, Wemmer pan upgrade
   - Master plan development
   - Economic development and surrounding areas
   - Upgrade park facilities
   - Reinstall the musical fountain
   - Security upgrade
   (Attractions 2013).

4. Faraday Inner City Park proposal.
   (2011)
   - Transport Interchange

5. Urban Green link, Faraday Park extension
   (2011)
   (Inner city parks 2011).

   - Retail
   - Commercial
   - Offices
Fig 5.1 > Constructed overlay of existing proposed frameworks (Google earth 2013).

- Public Facilities
- Residential
- Upgrade Transport system (The Maboneng Precinct 2013).

7. Sojo Trail 2005 (Soweto Johannesburg Development Project)
   - Tourist trail running from East to West
   - Trail runs from Pioneer Park, past the James Hall Transport museum, past Turffontein Race Course, through Gold Reef City and past the Apartheid Museum to finish at the Hector Pieterson Memorial Park.
The proposed macro framework aims to integrate existing proposed frameworks with the proposed frameworks. The aim is to link urban nodes on a macro scale to create an integrated urban system. The macro framework focuses its energies on connecting the South to the North, ultimately creating a new gateway into the city and promoting sustainable development on the city edge. Introducing a new layer to the existing transport network will allow accessibility and increase connection opportunities. The public pedestrian realm is also very important in creating and urban system. In response walkable connections between urban nodes is fundamental to a sustainable city which promotes public green connections and open public space.

This vision for the macro framework comments on Woods theory that states;

“The entire network of connected structures resonates individuality, and together in the civic space as an ensemble, a community, an urban knit. The whole is indeed greater than the sum of the parts…”

(Woods 1890: 5)
EXISTING URBAN REGENERATION AND FRAMEWORK NODES.

- Mixed use urban regeneration nodes.
- Transport upgrade.
- Land remediation.

PROPOSED MACRO SCALE URBAN REGENERATION OF EXISTING NODES.

- Existing transport nodes.
- Existing urban park and recreational nodes.
- Existing business development nodes.
Fig 5.3 > Illustration of overall urban framework

Red numbers indicate existing frameworks, and black indicates the proposed frameworks for the purpose of this dissertation.

Existing train route

Existing vehicular arterial, Wemmer Pan road.
Overall existing and proposed urban framework

1. **Existing Farraday inner city development proposal**

2. Proposed urban Pedestrian link from Farraday to Shaft No. 2


4. Pedestrian link from Village Deep train stop to Shaft No.2 and urban link.

5. Proposed Ecological Observatories and ecological landscape park.

6. **Existing green landscape park link to Wemmer Pan precinct.**

7. Current mine dump removal and proposed land remediation for urban link.

8. Pedestrian link from Booysens train stop to Wemmer Pan urban precinct.

9. **Existing Wemmer Pan precinct regeneration proposal-Johannesburg Parks.**
   - Park Regeneration
   - Revival of the musical Fountains
   - Upgrade security
   - Upgrade public amenities
   - Bring back annual boat races

10. **Existing Flower Market extension IDP proposal- Local Government.**

11. **Existing Johannesburg Market 2 phase development- NDP proposal- Local government.**

12. Pedestrian link from Kaserne train stop to Flower and Market precinct.

13. Proposed Decking of 5m sunken train tracks.

14. **Proposed multi-functional mixed use development.**

15. **Existing Prop visitor center at old Village main mining site.**

16. **Existing Maboneng Precinct regeneration master plan (2013)**

17. **Bus link Farraday and Shaft No.2 to Arts On Main**

18. **Link from Farraday to Mai Mai market**
Proposed Urban routes

With the development of the urban framework and the existing urban fabric, user routes where defined to potentially enhance the connectivity of the urban nodes through local and abroad users. Undertaking these routes would take the user on a journey of the existing but forgotten nodes, new proposed routes which come from the urban proposal, reactivating them in a larger urban network.

This comments on Sorkin's 12 Qualities (Page 30), namely; diverse, neighborly and complex.

The proposed urban routes would be, the historical route, educational route, ecological and landscape route and the ecological remediation route of Shaft No.2. The routes do not exist in isolation, but when overlayed create a network of interconnecting routes allowing for choice and options to change routes at any given point of the urban journey.

The aim of the urban framework and proposed journeys is to create a socially inclusive urban ecology, and also to promote eco tourism within Johannesburg.

The proposed routes have been overlayed to show the complete network of interconnecting routes (fig 4.12) and following each route mentioned will be isolated and explained in more detail (page 133).
A historical route has been proposed within the proposed North South urban link. This route would pass by the James Hall transport Museum, onto Wemmer Pan which was an old brick quarry, through Shaft No.2 and onto the village main mining site and Joubert Park, one of the oldest parks in Johannesburg.

Catering for a diverse user group is an important aspect with the proposed macro urban scheme. A proposed educational route would benefit a variety of scholars from all ages, educating them about environmental issues and ecological benefits and protection. The route aims to link a variety of existing urban nodes to create a diverse fun and educational outing.
Linking the existing urban nodes is proposed by an ecological public landscape. Integrating the landscape with the urban context is an important aspect to create a soft urban weave which currently doesn’t exist. The aim is to create a walkable environment through land remediation mediating the link between North and South.

On a more micro scale, an ecological landscape route has been proposed. This route aims to connect the users and pedestrians of Shaft No. with the architecture and site, but still link to the greater proposed urban framework and routes. This route would meander through the remediated landscape and the fauna and flora landscape, aiming to create awareness and appreciation of this previous site of terrain vague.
PHASE 1

Minimum public investment for maximum preservation of landscape

Conical North strip isolates most important landscape elements

Fig 5.9: Urban diagram showing North-South urban band.
2. Proposed urban Pedestrian link from Farraday to Shaft No.

3. Proposed Public view point of Johannesburg and new urban development.

4. Pedestrian link from Village Deep train stop to Shaft No.2 and urban link.

5. Proposed Ecological Observatories and ecological landscape park.

7. Current mine dump removal and proposed land remediation for urban link.

   - Park Regeneration
   - Revival of the musical Fountains
   - Upgrade security
   - Upgrade public amenities
   - Bring back annual boat race event

17. Add traffic lights to vehicular intersection
PHASE 2

Programmatic reservations

North/South: nature, open and public space

East/West: Mixed use development, agriculture, green connections.

Fig 5.11 > Urban diagram showing North-South and East-West urban bands

Note > The East-West band will redevelop the existing mine which is currently being re-mined.
1. Farraday inner city development proposal -

6. Proposed green landscape park link to Wemmer Pan precinct.

8. Pedestrian link from Booysens train stop to Wemmer Pan urban precinct.


12. Pedestrian link from Kaserne train stop to Flower and Market precinct.

13. Proposed Decking of 5m sunken train tracks.

Fig 5.12 > Illustration showing phase 2 of the intended urban framework.
PHASE 3

Densification

Fig 5.13 > Urban diagram showing North-South and East-West urban bands

Note > Development happens along the East-West urban band.
Fig 5.14 > Illustration showing phase 3 of the intended urban framework.

14. Proposed multi-functional mixed use development in current zoning industrial 1. This zoning allows for mixed, such as, commercial, residential, industrial and offices.
New York’s Central Park was the first urban landscaped park in the United States. The park’s construction began in 1857, the park’s location was chosen by the city and the park planners because its terrain was unsuitable for commercial building. The site for the new park offered rocky vistas, swamps, and the old city reservoir (Rosen 1992: 47).

These varied elements would be refined, enhanced, diminished, and eradicated to create a park in the style of European public grounds, with an uncorrupted countryside appearance.

Architectural structures were to be kept to a minimum—only four buildings existed in the original plans for the park and the design and building material of the bridges were chosen...
to assure that they were integrated as naturally as possible into their surrounding landscapes (Rosen 1992: 62).

Central Park relates to the size of the proposed urban macro urban framework presented on page 129. This precedent also comments on the geological nature of the Johannesburg mining belt and more specifically Shaft No.2 as it share similarities of urban and ground conditions which have been referred to as a third landscape.
Fig 5.17: Photograph of the great lawn (Javed Sultan) home page, Javed-Sultan blogspot, 2011.

Fig 5.18: Designer unknown, home page, Mappery website, 1994 (Map of Central park main routes)
Shaft No2.
Nelson Mandela Stadium
Ellis Park
Mai Mai Market
Farraday taxi rank and market
Arts on main
Nelson Mandela Stadium
Jeppiestown train stop
Ellis Park
Mai Mai Market
Farraday taxi rank and market
Fig 5.19 > Aerial Image of Johannesburg, 2013. Google Earth
Fig 5.20 > Designer unknown, home page, Mappery website, 1994 (Map of Central park)
Fig 5.21 > Size comparative of Central Park to Johannesburg and Shaft No. 2. Comparasime.
1 km 3.8 Km
The meso scale focuses on more specific urban interventions in relation to Shaft No.2. Urban connection and landscape are proposed.

Two important pedestrian links have been identified, the connection from Farraday taxi rank and Village Deep train stop. Both these nodes are within a walkable distance to Shaft No.2 and the urban landscape.

Green urban connection are also focused on, within the meso framework and extension of Shaft No.2 landscape becomes an open pedestrian landscape park, connecting to Wemmer Pan.

Public walk routes are also established, linking Shaft No.2 to the surrounding environment, with the future development of Shaft No.2 this routes would extend through the landscape ultimately linking the Flower Market and Wemmer pan to create an eco-landscape route.
2. Proposed urban Pedestrian link from Farraday taxi rank and market to Shaft No.2

3. Proposed Public view point of Johannesburg and new urban development.

4. Pedestrian link from Village Deep train stop to Shaft No.2 and urban link.

5. Proposed Ecological Observatories and ecological landscape park.

6. Proposed green landscape park link to Wemmer pan precinct.

7. Current mine dump removal and proposed land remediation for urban link.

17. Add traffic lights to vehicular intersection
Parc de la Villiette- Bernard Tschumi
Paris
Project size 125 acres

Parc de la Villiette was constructed on one of the last remaining large sites in Paris, a 125 acre expanse previously occupied by the central slaughterhouses and situated in the North East corner of the city, between the Metro stations Porte de Pantin and Porte de La Villette (Parc de la Villette 1998). Parc de la Villette is over one km long in one direction and 700m in the other.

La Villette appears as a multiple programmatic field, containing, in addition to the park, the large museum of science and industry, a city of music, a grande Halle for exhibitions, and rock concert hall (a leading establishment in the French cultural landscape. 2010).

Parc de la Villette was not meant to be a picturesque park reminiscent of centuries; it was more of an open expanse that was meant to be explored and discovered by those that
Fig 5.24 Designer unknown, home page, waymaking website, 2013 (Aerial photo of Parc de la Villette)
visited the site. Tschumi wanted the park to be a space for activity and intersection that would evoke a sense of freedom within a

As part of Tschumi’s overall goal to induce exploration, movement and interaction, he scattered 10 themed gardens throughout the large expansive site that people would stumble upon either quite literally or ambiguously. Each themed garden gives the visitors a chance to relax, meditate, and even play.

Of the 135 acres, 85 acres are dedicated to the green space which are categorized as surfaces. The large open green spaces give people space to interact, play, relax and gather.

Parc de la Villette is designed with three principles of organization which Tschumi classifies as points, lines, and surfaces. The 135 acre site is organized spatially through a grid of 35 points, or what Tschumi calls follies.

The folly grid is related to a larger co-ordinate structure, an orthogonal system of high density pedestrian movement that marks the site with a cross.

The North south passage or co-ordinates links the two Paris gates and subway stations of Porte de la Villette and Porte de Pantin while the East West co-ordinates joins Paris to its Western suburbs.

Tschumi’s lines are essentially the main demarcated movement paths across the park. Unlike the follies, the paths do not follow any organisational structure; rather they intersect and lead to various points of interest within the park and the surrounding urban area.

In the context of Johannesburg and Shaft No.2 Parc de le Villette is a reference to the meso urban framework, the main urban aim is to link the North to the South and the East West through an urban framework of open green spaces, urban routes and sustainable development by connecting existing urban nodes to a larger urban context as discussed on page 129-134.
These urban nodes resemble the follies in which Tschumi speaks about, although these urban nodes are fixed points in the urban fabric, by creating different urban routes this allows for them to be discovered within the proposed urban network, page 129. Each urban nodes gives the visitor a new experience, allowing for a chance relax, observe, play or learn.

Fig 5.26> Sketch showing intended North South and East West connections.
The framework for Shaft No.2 is aimed at the connection between public private, architecture and nature. The entire site needs to be a journey for visitors, allowing a visual connection with the private without the disruptions. Nature and architecture should respond to each other with an interventions and landscape that allows for this amalgamation. Using the site condition, the aim is encourage further remediation of the site, establishing a systemic site ecology, thus creating environmental awareness and public attraction.

With the architecture being a platform for knowledge and research, in turn the landscape should be a product of its research heightening the experience of the users. The site framework also aims at connection with the mesa and macro frameworks resonating with Woods theory on the connected whole (page 127).
1. Site Entrance from Wemmer pan road
2. Parking for visitors and staff
3. Bus stop
4. Main entrance
5. Exhibition area
6. Fauna and flora landscape
7. Proposed Ecological Observatories
8. Retention pond
9. Traffic lights
10. Phytoremediation landscaping

Note > Special attention has been given to public and private accessibility and circulation. The concept of the public being part of programme without direct contact or interference.
Plants used for Shaft No.2 framework

1. Vetiver grass
2. Gypsophila Sphaerocephala
3. Cogon grass
4. Bauhinia thonningii
5. Acacia polyacantha
6. Bauhinia thonningii

Fig 5.28 > Map indicating location of proposed plant species.
For the purpose of this dissertation, only three of the 6 plant species will be discussed below.

1. **VETIVER GRASS - GIANT KING GRASS (INDIGENOUS)**

   Vetiver grass due to its morphological and physiological characteristics, is highly tolerant to extreme soil conditions including heavy metal contamination, the deep root system aids in the prevention of soil erosion on steep slopes and rough terrains (Truong and Baker 1998: 66).

   Vetiver grass is also able to extract heavy metals from soil conditions and is very effective in dust prevention and the grass when in a mature state acts as a wind barrier.

2. **GYPSOPHILA SPHAEROCEPHALA**

3. **COGON GRASS**

4. **BERKHEYA CODDI**

5. **ACACIA POLYACANTHA (INDIGENOUS)**

   The use of Acacia polyacantha is because of the plants ability to grow in hostile environments and enhance soil fertility. This is very important with regards to land remediation and creating a productive socio ecological landscape.

6. **BAUHINIA THONNINGII (INDIGENOUS)**

   This tree species was chosen because of proven test that the Bauhinia thonningii is able to grow in toxic conditions and aid in soil remediation.
This section of the document will discuss the process of selecting and developing the activity which is inserted into this terrain. It also documents the design development of the site after a programme is introduced.
This dissertation is proposed as an investigation into the ability of architecture to create a place where the past, present and future may be negotiated. This negotiation is one between the multi-cultural, multi-ethnic citizens of Johannesburg. The negotiation is also purposed to be one between the scarred landscape, which is a result of mining, and the creation of an ecologically balanced terrain for continual future inhabitation. The goal is to manifest an architectural intervention that is responsive to the continual time cycle of Johannesburg as a context and to the conditions of the chosen site in particular.

This dissertation attempts to pioneer an architecture uniquely developed for the manipulation of the threshold between the archipelago’s of synthetic mine dumps and living conditions of this urban sprawl.
Fig 6.1 > Early conceptual sketch of site entrance.
Background-

Discourse on *terroir* and *terrain vague*

When applying the understanding concept of *terrain vague* and *terroir* to a site, the concept also starts to represent unacceptable socioeconomic deterioration. In approaching these sites of disorder, solutions have often been superficial in that they do not confront the root cause or the motions which formed the space. Thus the site itself is a metaphor for city, its past and present, (discussed in chapter 2).

On a larger scale, architecture and urban design is projected into these vacant spaces, applying some sort of logic which aims to assimilate these spaces into the productive logic of a city. Although the city of Johannesburg developed in an unorganized array of left over space 'uitvol grond', architecture acts as an organizational structure, a means through which transformation can be achieved.

Organizational transformation of space within a city can be explained by two systems, one propositional and the other, reactionary. Currently the site has a reactionary status, a tension between cause and effect and the natural systems, a reaction between man and nature. The natural systems have naturally started to reclaim this void in the urban fabric. Rem Koolhaas’ investigation of the relationship between architecture and urban voids offers a discourse in Imagining Nothingness, Koolhaas speculates that the grand gestures, the imposing logic - paper diagrams far removed from the sites they are intended for - applied by architects to urban space, originate from a fear of the void, a fear of nothingness, The nothingness present in the metropolitan void unsettles the stability of the urban solid.
I argue that the urban void is more important to the city’s urban fabric, imprecision of limits and discord are celebrated conditions. The site represents a counterpoint to the imposed order of over-inscribed urban narratives and the dominating influences of consumption on the city. Rem Koolhaas sums up the delicate interplay of architecture and urban void, he writes:

“Where there is nothing, anything is possible. Where there is architecture, nothing (else) is possible (1995:199).”

Thus the ‘nothing’ acts as a metaphor of this ‘non place’, a place which is not commanding influences of commerce and economic production. What exists here is the opportunity for spontaneity, for activity not accommodated for in the current urban structures of spatial consumption and order.

This opportunity of spontaneity allows for the potential for inhabiting space, for experiencing the city, in a new and different ways.
Theoretical premise-

“In memorable experiences of architecture, space, matter and time fuse into one singular dimension, into the basic substance of being, that penetrates our consciousness. We identify ourselves with this space, this place, this very moment, and these dimensions become ingredients of our very existence. Architecture is the art of reconciliation between us and the world, and this mediation takes place through the senses.” - Juhani Pallasmaa- The Eyes of the Skin: Architecture and the Senses, 2012.

This dissertation will aim to show how the architecture of a third landscape can be used as a means of negotiation, mediation, knowledge and ecological preservation.

The images to the right describe 4 concepts which have been applied throughout this dissertation.
Fig 6.6 > Kinetic Connections

Note > These are important qualities because the structures are kinetic instruments that measure the earth's dynamics. The structures absorb elements of earth's energies to actively dramatize invisible forces.

Fig 6.7 > Movement

Note > Structures built to connect with the world, they are instruments of this change, measuring both the life of the planet and the corresponding changes of those living within.
1.3 Site generators-

Fig 6.8 Early concept sketch showing development of building placement
Special focus was given to the natural stream which occurs to the north of the site, as a natural generator as well as defining the perimeter of where the natural ground meets the man made mine dump. Recognition was of the main vehicular arterial was also taken into consideration. By establishing these parameters, the extent of site for the purpose of this dissertation was defined.

Due to the North South vehicular arterial which runs past Shaft No.2, a decision was made to define a open buffer zone between the street and the placement of the building, this would allow for noise to dissipate as well as allow public and pedestrian circulation along the road front. This open buffer will form part of the entrance to the site and building.
In an attempt to increase natural regeneration at Shaft No.2, a decision was made to extend the parameter of the existing stream by creating a wetland which the stream would extend into. By doing this, an infrastructure for a natural ecology has been developed, as well as using the wetland as a process of removing any toxins which may exist.

The final generator of the site and building location was determined by the open mine shaft. The aim is to use the shaft and the acid mine water as part of a geothermal heat exchange system. This would be used to ensure a thermally sound and comfortable environment year round. Orientation of the building mass will face North, allowing for maximum solar gains on the North facade, and soft natural light on the south.
Site plan summary

As a collective summary of the site generators, an initial site plan was developed as a base for further interpretation and design investigation in a more technical and detailed manner.
Design process-
Fig 6.15 > Process model and design development.

architectural insertioan

Wemmer Pan road
Fig 6.18 > Final building layout sketch.

Fig 6.19 > Final building layout model.

Site entrance
Public space
Ecological Observatories
Wetland sample collection
Parking
Public interaction space
Ecological admin and offices
Ecological admin and offices

Wemmer Pan road

proposed hybrid architecture
Fig 6.20: Design sketches of architectural intervention and development.
Shaft No 2

Prop. Fauna and Flora Landscape

Proposed landscape remediation

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Fig 6.21 > Locality plans.
1. Fauna and Flora floodscape.
2. Ecological Observatories.
3. Shaft No.2
4. Public observation.
5. Sample sorting and collection.
1. Fauna and Flora flood-scape
2. Ecohydrology observatory
3. Botany observatory
4. Environmental Science observatory
5. Public Observatory observation deck
6. Guest laboratory
7. Admin and staff amenities
8. Exhibition and central space
9. Sample storage
10. Internal open courtyard
11. Ablutions
12. Sample collecting and sorting
13. Seed and sample storage vault
14. Open public space
15. New bus stop
16. Parking
17. Open public landscape
18. Public walkway
19. Public viewing platform
20. Eco walk into landscape
Fig 6.25 > Ground floor circulation plan rts.

- Proposed bus stop
- Pedestrian route
- Public circulation
- Private circulation

1. Fauna and Flora flood-scape
2. Ecohydrology observatory
3. Bontany observatory
4. Environmental Science observatory
5. Public Observatory observation deck
6. Guest laboratory
7. Admin and staff amenities
8. Exhibition and central space
9. Sample storage
10. Internal open courtyard
11. Ablutions
12. Sample collecting and sorting
13. Seed and sample storage vault
14. Open public space
15. New bus stop
16. Parking
17. Open public landscape
Fig 6.26 > Roof circulation plans.

- Public circulation
- Service circulation
Fig 6.27> Section A-A nts.

- Public and Private Entrance
- Open Courtyard
- Public walkway
- Green ramp

and central space
Fig 6.28> Section B-B nts.
2. Ecological Observatories.
3. Shaft No. 2
4. Public observation.
5. Sample sorting and collection.
The fauna and flora flood scape provides infrastructure for fauna and flora to inhabit the site, promoting natural remediation and ecological diversity. The flood scape is sunken to meet the stream level, thus the closest part of the flood scape to the stream is permanently has water flowing into the flood scape (see section on page 171). An ideal habitat for a wetland ecology is established.

The portion furthest away from the stream collects sand deposits from rain water run off and perennial stream level fluctuation. These deposits providing ideal conditions for fauna germination and photosynthesis. As the flood scape develops into a self sustaining environment, the attraction of fauna becomes more apparent.

Thus in time, a micro ecology develops at Shaft No.2, a catalyst for ecological remediation of the site.
Soil deposits from rain, wind, and natural erosion increase biodiversity. Water purification is facilitated by constructed infrastructure for fauna and flora. Existing stream and rainwater run off contribute to the natural process of remediation. Sunlight, a natural light source and heat, promotes the process of photosynthesis. Attract fauna species and micro ecosystems promote the natural remediation of the 3rd landscape. SUSTAINABLE ECOSYSTEM.

Fig 6.31 > Systemic diagram of Fauna and Flora
Fig 6.32 > Development sketch of flood-scape.
Fig 6.33 > Conceptual sketch of the flood-scape
2.2 Ecological Observatories

Fig 6.34 > Initial observatory plan
Fig 6.35 > Early concept sketch of Observatory form, orientation and the relationship to the fauna and flora landscape.
Fig 6.36 > Concept model for structural tectonics of observatory.

Note > The tectonics of the models aims to express and explore a structural system and materiality for the observatories.
Fig 6.37 > Sketch of observatories.
Fig 6.38 > Layout drawing observatories nts.
Fig 6.41 > Rendering of a Massing and form exercise of observatory.

Note > This rendering in no ways implies materiality. This rendering employs the same tactile quality of a cardboard massing model. Materiality will be explored and presented further on in the document.

Fig 6.40 > Rendering of a structure exercise of observatory.

Fig 6.39 > Rendering of a structure exercise of observatory.
Fig 6.42 > Technical section through observatory.nts.
Fig 6.43 > Rendering of West elevation shading device.
The public observation deck serves as part of the public circulation space, also incorporating an indoor display and terrarium tanks and a viewing pavilion. The west wall between private and public contains a series of window openings which ensures a visual translucency into the observatories, where scientists and students can work and be viewed from the confinement of the observation deck. This separation ensures the safety of the public without hindering the visual interaction between the public and private.

The east wall consists of a one way reflective polycarbonate panel. This design choice allows for the reflection of the work being carried out by scientists while inside the observation deck. This allows for a scene of interaction between private and public even when passing through the observation deck on route to the eco walkways.

From the outside, one is able to partly see into the observation deck because of the one way reflective material. A level of visual permeability occurs as well as reflecting the natural surroundings, this design element allows the visitor to experience the natural surrounds as well as having a glimpse of internal activities without physically being inside.

The aim is to create a series of experience through programme and architecture which strengthen the public experience of the site and building as a whole, rather than creating experiences of compartmentalized internal spaces.

The roof of the observation deck consists of
a lightweight structure. Clear polycarbonate sheeting and solar cells cast in resin make of the roofing compound, and shading is addressed by a retractable horizontal curtain system.

This system has a dual function, shading being the primary and most obvious, and secondly, due to the synthetic compound of the curtain strands, these strands expand and contract with humidity. By the expanding and contracting of the strands, one is able to measure the humidity in the air, which is recorded for environmental purposes.

These fluctuating strands and solar cell roof compound add up to a kaleidoscope of visual patterns which are caused by natural phenomena of the environment.

The array of light and shadows activate the space on a sensory level, indicating how the architecture responds to its climate in a natural way. This is in light to the opening quote by Pallasmaa (page i).
DETAIL 1

1. 6mm partially toughened glass.
2. Photovoltaic cells cast in 2mm clear resin.
3. Aluminium purlins.
4. Aluminium support for glass above.
5. IPE 200 steel I beam.
DETAIL 2

1. Recycled clear polycarbonate multi wall sheeting.
2. Pressed sheet aluminium cover profile.
3. One way film applied to laminated toughened glass.

Fig 6.47 > 3D of Complete roof and reflective wall component.
The Aeolian Harp was designed and structured around the Aeolian wind-belt harp concept, and the conversion of kinetic energy to sound energy. Operating as a public sensorial instrument, the Aeolian harp plays the music of the wind. Caused from the reverberation of the harp belts, the driving winds from the South West activate this public spectacle. As the belts are made from different materials and tensions, the Aeolian harp will never produce the same sensorial display of music, this constant difference aims to attract public viewers on a frequent bases, adding to the experience of Shaft No.2.

The Aeolian harp doubles as a tracing and recording device of wind speed and direction. These recordings are an important aspect in terms of the climatic science observatory. The recordings of the Aeolian harp are traced and stored and can be then be mapped over a period of time, indicating fluctuation within our environment.

Although the concept of an Aeolian harp is simple, the recording is done by sensors which exist on the belts, these record the amount of movement past a stationary point, as well as the vibrations which accour.
Fig 5.48 > Concept sketch of Aeolian harp and observatory.
Fig 6.49 > Concept model of the Aeolian harp technical components and structural integrity.

Fig 6.50 > Drawing study of Aeolian harp model.
Fig 6.51 > Concept model of the Aeolian harp.
Environmental considerations:

1. A wetland is created as an infrastructure for ecological development and remediation.

2. Use of Phyto Indicators in the wetland will indicate any toxins by changing color from green to blue.

3. A purification process of the existing stream is implemented to remove toxins and heavy metals which exist in the water.

4. The process called precipitation extracts the heavy metals by solidifying the metal extracts onto synthetic strands which hang from the observatories. Thus through this extraction process the solidified crystals grow up the strands creating and extra layer of solar protecting from the west sun.

5. Dual flush sanitation systems are installed.

6. A grey water strategy harvest the waste water from ablations and the seed washing troughs. This water is sent through a biofilter pit for secondary uses.

7. The series of ecological observatories are orientated north for maxim daylight illumination and solar energy gain through solar cells. The aim is to create a thermally comfortable working environment.

8. Sliding wall panels in the observatories allow for adjustable options for internal room conditions, optimizing the work space for temperature and internal specific conditions.

9. Geothermal heat exchange utilities the acid mine water within the shaft. This will convert the water to a high temperature which can be used for thermal insulation in floor slabs for summer and winter.
10. An interlocking louvered roof system allows for thermal control, light quality, ventilation and allow for rain water penetration which would prove invaluable in the botany and ecohydrology observatories.

11. Led lighting solution powered by the solar cell batteries are utilized for the lighting strategy, sufficient daylight illumination allows for lighting systems to be active only at night.

12. Material weather is taken into consideration, the natural process of decay on certain materials allows for the architecture to resemble a process of the natural world.

13. Site parking boundary consists of a natural constructed berm. The use of branches and debris constructed on a rock and grass base will blend into the environment as well as hide any trace of vehicles. Living plants will also be incorporated to absorb the air pollution from vehicles.
Fig 6.53 > Concept model expressing the weathering of material (initially).

Fig 6.54 > Concept model expressing the weathering of material (eventually).
Fig 6.55 > Concept diagram of proposed parking berm.

SYSTEMIC ENVIRONMENTAL SUMMARY

O²

CO²

O²

CO²

CO²
EXISTING SITE ECOLOGY

- Natural and man-made landscape
- Toxic soils and infected water
- Existing micro ecology
  - Fauna and flora

SHAFT No.2

- Tracing and recording of the third landscape
- Built infrastructure

INFRASTRUCTURE FOR ENVIRONMENTAL REMEDIATION

- Fauna and flora floodscapes
  - Increase biodiversity
  - Phytoremediation
  - Ecological landscape
  - Soil rehabilitation

WATER PURIFICATION

- Precipitation
  - Extraction of heavy metals from a water

ECOLOGICAL OBSERVATORIES

- Ecological uplifting through knowledge and active remediation

ECOHYDROLOGY

- Solar harvesting
  - Productive waste management
  - Grey water treatment
  - Compost silos

BUILT INFRASTRUCTURE

- Existing site ecology
Fig 6.56 > Systematic diagram showing the closed loop system of man and technology amalgamating.
The structural investigation of the proposed Ecological observatory comments and focuses on the theoretical premise of Gottfried Semper. He explores the tectonic relationship of architecture materiality. In his Die Vier Elemente der Baukunst he argues that architectural composition can be divided into two opposite material procedures: the stereomatic that relates to solidity, and the tectonic that defines dematerialisation (Semper 1995: 3).

There is also the theory which states that these inherent opposites in architectural materiality forms cosmological opposites of each other, where the stereomatic mass symbolizes earth, while the tectonic forms an analogy for the sky. This theory is in light of Kenneth Frampton (Frampton 1995: 45) who wrote Studies in Tectonic Culture.

As discussed in chapter 5, Shaft No.2 exists of a natural and synthetic man made landscape. With only the concrete footings and the vertical shaft left on site. The relation between earth and sky becomes the platform for architectural intervention, becoming a stereomatic and tectonic connector of the 2 opposites. The structure should aim to be an extension of the earth which dissipates into the sky.

It is within this theoretical premise that the relationship between the existing and proposed is tectonically explored and resolved in the context of Shaft No.2.
Fig 6.57 > Photograph of existing concrete footing with the context of Shaft no.2.
Fig 6.58 > Early sketch rendering of observatory in Fauna and Flora landscape.

Note > Special attention has been structural support. One single element is used as an a single extension from stereomatic mass.
3.2 Building materiality -

Fig 6.59 > View of Shaft No.2 stereotomic character of the existing site
The aesthetics existing of Shaft No.2 comprise of a simple Pallet. For the purpose of the dissertation its was not only important to make reference but also understand the composition of the existing material aesthetics and combination of Shaft No.2. In the development of the tectonics of Shaft No.2, new materials should compromise the unique state of the site, but rather enhance and compliment the qualities. It is also very important that the new materials express aging and a degree of weather to form a connection between new and old. Therefore the use of contemporary materials is specified to form analogies between the fabric of Shaft No.2, detailed and applied in a thoughtful process to promote weather. By implementing this technical concept, the new ecological observatory does not only aid in remediation of shaft No.2, but inherits physical qualities of the present, allowing nature to entwine with the architecture.
Models-
Fig 6.63: Architectural model
CONCLUSION

When amalgamating contrasting systems in a systematic way, a hybrid is developed. This hybrid is in constant cohesion with its physical context and nature. It is evident that this hybrid exists from a site of *terrain vague*, thus creating a socio-ecological platform for sustainable designs and urban environments that promote sustainable development. It is through this symbiosis that the hybrid architecture can act as a catalyst for re-scripting the third landscape. This is achieved through facilitating knowledge and applying it to a site of *terrain vague*.
APPENDIX

1

FINAL DESIGN
This section of the document includes the final drawings that were presented at the final exam. It reveals the architectural product and forms a conclusion to the hypothesis that was stated on page 20.
Plans-
LEGEND

1. Wemmer Pan Road
2. Rossettenville Road
3. Existing buildings
4. Pedestrian Walkway
5. Bus stop
6. Building Entrance
7. Public Landscape
8. Parking Area
9. Walkways into Landscape
10. Eco-Hydrology Observatory
11. Botany Observatory
12. Environmental Science Observatory
13. Exhibition Area
14. Sample collection and sorting
15. Sample Storage
16. Data and sample Vault
17. Public Observation Deck
LEGEND

1. Wemmer Pan Road
2. Pedestrian Walkway
3. Bus stop
4. Building Entrance
5. Public Landscape
6. Parking Area
7. Walkways into Landscape
8. Eco-Hydrology Observatory
9. Botany Observatory
10. Environmental Science Observatory
11. Exhibition Area
12. Sample collection and sorting
13. Sample Storage
14. Data and sample Vault
15. Public Observation Deck
Section A A-
Ecological Observatories

Phase 1 - Inception
Phase 2 - Remediation
Fauna and Flora

flood-scape-
“The fauna and flora flood scape provides infrastructure, promoting natural remediation and ecological diversity”.

Proposed Infrastructure For Natural Remediation

EXISTING ROCKS AND RUBBLE

EXTENSION OF EXISTING WATER BODY

EXISTING AT SHAFT No.2

EXISTING ROCKS AND RUBBLE

EXTENTION OF EXISTING WATER BODY

EXISTING WATER CONTAINS TOXINS

INCREASE EXISTING GRASS AND WATER PLANT SPECIES

ACACIA POLYACANTHA & BAUHINIA THONNINGII

GYPSOPHILA SPHEROCEREA

PHYTO - INDICATOR

VETIVER GRASS & WATER REEDS

PROPOSED PLANT SPECIES
Ecological Observatories-
"The tracing and recording of the landscape through ecological studies".

ECOLOGICAL OBSERVATORY

SKY

EARTH

FAUNA AND FLORA FLOOD-SCAPE

TECTONIC
The tectonic structure forms an analogy for the sky. The lightweight element extends from the stereomatic mass extending from the mediating platform. With consideration for the landscape and an understanding of terrain the tectonic analogy resonates with choice of materiality, site context and programme.

LIGHT WEIGHT STEEL FRAME STRUCTURE

SLAGMANT CEMENT AND TIMBER FLOOR SLAB

CONCRETE STRUCTURAL FOOTING

FAUNA AND FLORA WETLAND

STEREOMATIC MASS
The stereomatic mass symbolises earth. The concrete footing is an extension of the earth to which it meets the stereomatic platform from where the tectonic may extend into the sky.
Crystal Lattice

skin -
Extracting heavy metals through the scientific act of precipitation.
Aeolian Harp-
"Operating as a public sensorial instrument, the Aeolian harp plays the music of the wind while recording wind speed and direction".
Public Observation
deck-
Spatial awakening cannot exist in a permanent state a built structure.

“Serves as part the public circulation space, incorporating an indoor display and public viewing pavilion.”
Aerial View and Landscape Plan-
5. ACACIA POLYACANTHA (INDIGENOUS)

The use of Acacia polyacantha is because of the plant's ability to grow in hostile environments and enhance soil fertility. This is very important with regards to land remediation and creating a productive socio-ecological landscape.

6. BAUNHIA THONNINGII (INDIGENOUS)

This tree species was chosen because of proven test that the Bauhinia thonningii is able to grow in basic conditions and aid in soil remediation.
Final presentation photographs -
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