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## LANDSCAPE EXPERIENCE

AN ARCHETYPAL LANDSCAPE APPROACH TO WATER SPACES



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requirements for the degree  
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I further state that no part of my thesis has already been, or is currently being, submitted for any such degree, diploma or other qualification.

I further declare that this thesis is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

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Figure 1: Ruins on the Old Rosema & Klaver  
Brickworks Quarry. Photographed by Author (2013).



## PROJECT SUMMARY /

<b>Dissertation title /</b>	Landscape Experience: An Archetypal Landscape Approach to Water Spaces
<b>Framework title /</b>	Silent Industry
<b>Site description /</b>	Old Rosema & Klaver Brickworks Quarry, Monument Park, Pretoria, South Africa
<b>Client /</b>	City of Tshwane and Government Departments such as: <ul style="list-style-type: none"><li>- Department of Parks and Recreation</li><li>- Department of Environmental Affairs</li></ul>
<b>Users /</b>	Monument Park Community, as well as regional visitors
<b>Site location /</b>	Remainder of Erf 428-JR, Waterkloof
<b>Address /</b>	Skilpad Street, Monument Park, Pretoria, South Africa
<b>GPS Coordinates /</b>	25° 48' 21.97" S; 28° 14' 22.41" E
<b>Research Field /</b>	Post-Industrial (brownfield) landscapes & Environmental Potential

### Landscape Architectural

<b>Theoretical Premise /</b>	On an urban level, brownfield sites can aid in the densification of suburban areas within a decentralising city, where rehabilitation, natural elements, and alternative industries can create experience and finally produce identity within an environment of 'placelessness'.
<b>Approach /</b>	Re-generating Monument Park and its brownfield brick quarry into a designed experiential landscape.



Figure 2: Wetland planting, growing along the quarry water body. Photographed by Author (2013).

to my family



Figure 3: The edge of the quarry water body.  
Photographed by Author (2013).



## ABSTRACT

### SAMEVATTING

Aesthetics were the main passion of early century landscape architects. A focus on the concern with ecology followed, while the late twentieth century landscape architecture developed towards a concentration on restoration and recovery and so focussed more on redeployment than replacement (Campbell 2006).

Today, in the twenty-first century, mankind is overwhelmed with issues of global warming, exhausted natural resources, and disappearing ecologies. Landscape architects are focused on providing sustainable landscapes from which both humans and nature can benefit. Attempts to create parks or green spaces for people's enjoyment become joined movements to simultaneously restore ecosystems, produce food or energy, reclaiming damaged sites and designing these interventions to be entertaining and interesting to the surrounding communities. Furthermore, landscapes have become catalysts in assisting with urban densification and reducing urban sprawl in their attempts to be multi-functional, process- and environment- focused designs. At last a question remains: do these twenty-first century landscapes relate to the individual? Have these sustainable systems and processes become the new aesthetic? And do visitors to designed landscapes still have rich spatial experiences?

This dissertation explores the questions stated above. Part One focuses on the countering of urban sprawl through a process-focused landscape design response on an urban and framework level, while Part Two investigates if this new contemporary notion aids designers to create spatially aesthetic landscapes. A theoretical study and experiential conceptual development strategies are followed to aid in form-generation.

The design follows a hypothetical course that starts with process and system planning followed by spatial landscape explorations. This phenomenological investigation will be resolved up to a detailed sketch plan level.

*Estetika was 'n belangrike passie vir vroeë eeuse landskap argitektuur, waarna besorgdheid oor ekologie gevolg het. Die laat twintigste eeuse landskap argitektuur het meer klem begin plaas op restaurasie en herstel en het daarom meer gefokus op herontplooiing as vervanging (Campbell 2006).*

*Vandag, in die een-en-twintigste eeu, is die mensdom oorweldig met probleme van globale verwarming, uitgeputte hulpbronne, en die vermindering van ekologiese diversiteit. Landskapargitekthe fokus op die voorsiening van volhoubare landskappe waaruit mens en natuur voordeel trek. Pogings om parke en groen ruimtes te skep vir die mens se plesier het 'n gesamentlike beweging geword om terselfdertyd ekosisteme te herstel, voedsel en energie te produseer, beskadigde terreine te herwin en hierdie ingrypings te ontwerp om vermaaklik en interessant vir die omliggende gemeenskap te wees. Verder het landskappe katalisators van stedelike verdigting geword en die bekamping van stedelike uitbreiding deur hulle pogings om multi-funksionele, proses- en sisteem gedrewe ontwerpe te wees. Uiteindelik is die vraag: is daar 'n verbintenis tussen hierdie een-en-twintigste eeuse landskappe en die individu? Het hierdie volhoubare sisteme en prosesse die nuwe estetika geword? En het besoekers aan hierdie ontwerpte landskappe steeds ryk ruimtelike ervarings?*

*Hierdie verhandeling verken die bogenoemde vrae. Deel Een fokus op die stryd teen stedelike uitbreiding deur 'n proses gedrewe landskap ontwerp reaksie, op 'n stedelike en*

raamwerk vlak. Deel Twee ondersoek die moontlikheid dat die nuwe eietydse neiging hulp verleen aan ontwerpers om ruimtelik-estetiese landskappe te ontwerp. 'n Teoretiese studie en ervaringsleer konseptuele ontwikkeling strategieë word gevolg om die vorm-generering aan te help. Die ontwerp volg 'n hipotetiese rigting wat begin met proses en sisteem beplanning en word vervolgd deur 'n ruimtelike landskap verkenning. Hierdie fenomenologiese ondersoek word opgelos tot 'n gedetailleerde sketsplan vlak.



Figure 4: Flowering plant species on site.  
Photographed by Author (2013).

## DEFINITION OF TERMS

### Post-industrial landscape

The definition by Loures (2012:4) will be used stating that a post-industrial site refers to a “landscape resultant from a thoughtful and systemic activity of man in the natural or agricultural landscape with the aim of developing industrial activities” and of which these activities are no longer active.

### Phenomenology

Phenomenology refers to an approach that concentrates on the study of consciousness and the objects of direct experience (Vroom 2006:250).

### *Genius loci*

*Genius loci* are understood as places that are a location which convey a special sense of physical identity or physical coherence. Physical characteristics influences place but with it so does culture. It is within the interactions between human awareness and suitable physical location that place attains its distinctive meaning (Berleant 2003:43).

### Archetypal landscape actions

Catherine Dee’s (2001:41) explanation of an archetype is as follows:

*“Archetypes can be described as similar forms or physical arrangements of human environments which have been repeated or copied over long periods of time and continue to perform the same types of actions. They are considered to be universal.”*

Therefore, for the purpose of this dissertation, archetypal landscapes can be defined as environments or landscapes that are universal to

us as humans; for instance, a jetty protruding over a vast water body serving as an easy access point to the water. When the author refers to archetypal actions she defines it as the universal actions that would take place when people use these spaces; for instance, the desire to run across the jetty and jump into the deep pool of water or the pleasure of sitting on the edge with ones feet hanging in the water. Carl Jung explains this concept perfectly when stating that archetypes are the components of the collective unconscious and they serve to organise, inform, and direct human thought and thus behaviour. See Chapter 6 for a more detailed explanation (Jung 1981).

### Eidetic operations

*Eidetic* refers to “a mental conception that may be picturable but may equally be acoustic, tactile, cognitive, or intuitive” (Corner 1999:153). When referring to eidetic operations, it can be described as an activity or specific idea-forming technique applied to mapping (analysis) of a site in order to imagine or project new landscapes through alternative measures.

### Landscape experience

For the purpose of this dissertation, the concept of landscape experience should be understood as the “*aesthetic satisfaction, experienced in the contemplation of landscape, stem[ming] from the spontaneous perception of landscape features...[such as] their shapes, colours, spatial arrangements and other visible attributes*” (Appleton 1975:69). Jay Appleton uses this definition when explaining the concept of *habitat theory* (further discussed in Chapter 6), and why people have certain ‘connections’ to landscapes.

CONTENTS		003	65	Future eidetic	96
		FRAMEWORK PROPOSAL		Thought on applied eidetic operations	98
ABSTRACT	ix	INTRODUCTION	68	CONCLUDING THOUGHTS ON THEORETICAL RESEARCH AND APPLICATION	99
DEFINITION OF TERMS	xi	RESPONSE	69		
LIST OF FIGURES	xiv	Urban	69		
PROLOGUE	xvii	Industry & Heritage	70		
PROLOGUE DESCRIPTION	xxi	Ecology	71	005	101
		Final Framework Proposal	72	EMERGING GENIUS LOCI	
		Location of individual design areas	73		
PART I	25			INTRODUCTION	104
COUNTERING URBAN SPRAWL WITH OPERATIVE LANDSCAPES		PART 2	75	DESIGN INFORMANTS	104
		QUESTIONING OPERATIVE LANDSCAPES AS THE NEW AESTHETIC		LANDSCAPE FABRIC	105
001	27			CONCLUSION	109
INTRODUCTION				006	111
		004	77	ARCHETYPAL LANDSCAPES	
URBAN SPRAWL	30	PROCESS VERSUS PICTURE		INTRODUCTION	114
CONTEMPORARY OBJECTIVES FOR URBAN SPRAWL	30			AESTHETIC SATISFACTION	114
PROBLEM STATEMENT	32	INTRODUCTION	80	PROVIDING FOR THE	116
THESIS STATEMENT	32	PROBLEM STATEMENT	80	DEVELOPMENT OF 'LEARNED' MECHANISMS BY REDUCING HAZARDS	
CLIENT & USER IDENTIFICATION	32	THESIS STATEMENT	80	ARCHETYPAL LANDSCAPE	116
URBAN SPRAWL WITHIN SOUTH AFRICA	32	RESEARCH & DESIGN METHODOLOGY	81	ACTIONS	
SITE SELECTION	36	RESEARCH OBJECTIVES	81	INVESTIGATING ARCHETYPAL	117
CONCLUSION	41	Current experience on Rosema & Klaver Brickworks Quarry	82	ACTIONS TO LAND-WATER- TRANSITIONS	
		Identified places on site with specific characters	83	PROGRAMME	119
002	43	ROMANTICISM	84	FOCUS AREA SELECTION	119
ANALYSIS		LANDSCAPES AS PICTURE VERSUS IMAGE	87	SWIMMING AS RECREATIONAL ACTIVITY	119
INTRODUCTION	47	CREATING EIDETIC IMAGES	90	FOCUS AREA ANALYSIS	121
MACRO SCALE	48	APPLYING EIDETIC	92	DESIGN DEVELOPMENT	125
MESO SCALE	52	OPERATIONS		FINAL SKETCH PLAN DESIGN	132
MICRO SCALE	53	Past eidetic	92	DETAILED SKETCH PLAN	133
MAIN ISSUES IDENTIFIED & POSSIBLE OBJECTIVES	62	Present eidetic	94	LIGHTING PLAN	134

SECTION OF SKETCH PLAN	135
ATMOSPHERIC PERSPECTIVES	136
CONCLUSION	139
007	133
TECHNICAL INVESTIGATION	
INTRODUCTION	136
PHENOMENOLOGICAL APPROACH	136
RETAINING WALLS	140
REHABILITATION STRATEGY	143
STRUCTURE OF THE BIO-FILTER	144
FLOATING WETLANDS & PEDESTRIAN ACCESSIBILITY	147
ABLUTIONS FACILITIES	149
008	161
CONCLUSION	161
BIBLIOGRAPHY	167
<i>BEDANKINGS</i>	<i>171</i>
APPENDIX A	173
APPENDIX B	179
APPENDIX C	187

## LIST OF FIGURES

### PART I: FRONT

Figure 1: Ruins on the Old Rosema & Klaver Brickworks Quarry. Photographed by Author (2013).  
 Figure 2: Wetland planting, growing along the quarry's water body. Photographed by Author (2013).  
 Figure 3: The edge of the quarry water body. Photographed by Author (2013).  
 Figure 4: Flowering plant species on site. Photographed by Author (2013).

### Chapter 1

Figure 5: View of quarry water body from southern terraces. Photographed by Author (2013).  
 Figure 6: Urban sprawl, Los Angeles, California (Berger 2006:23).  
 Figure 7: Gated communities, Houston, Texas (Berger 2006:31).  
 Figure 8: Aerial view of Fresh Kills Park, by James Comer/Field Operations. An example of an operative landscape (Czerniak *et al.* 2007:117).  
 Figure 9: City development of Pretoria, and its cultural demarcated areas (Van der Waal Archives, 2013).  
 Figure 10: Pretoria's form due to contextual aspects (Jordaan 1989:26).  
 Figure 11: Growth of Pretoria (TOSF vol.1 2005:20).  
 Figure 12: Speculative sprawl indicated through gated communities found in Pretoria (Author, 2013).  
 Figure 13a: Open space in Pretoria (Di Monte 2011:41).  
 Figure 13b: Wastelands in Pretoria (Di Monte 2011:46).  
 Figure 14: Location of Monument Park, in relation to Pretoria CBD (Author, 2013).  
 Figure 15: The original landform before any excavations started (Rosema & Era Archives, 2013).  
 Figure 16: The original layout of the Old Rosema & Klaver Brickworks quarry (Rosema & Era Archives, 2013).  
 Figure 17: Roelf Rosema (left) and Dirk Klaver (right) (Rosema Era Archives, 2013).  
 Figure 18: Excavation of clay on site (Rosema Era Archives, 2013).  
 Figure 19: Workers loading bricks at the Rosema &

Klaver Brickworks (Rosema Era Archives, 2013).  
 Figure 20: View of Rosema & Klaver Brickworks (Rosema Era Archives, 2013).  
 Figure 21: Wire cut brick making machine bought in 1951 (Rosema Era Archives, 2013).  
 Figure 22: Mr. C.M.T. Chaplin (Rosema Era Archives, 2013).  
 Figure 23: Developers advertising proposed developments for the Rosema quarry site. Photographed by Author (2013).  
 Figure 24: Main entrance gate to site closed. Photographed by Author (2013).  
 Figure 25: Fish caught on site by fisherman (Bassing 2013).  
 Figure 26: Canoeing on site by fisherman (Bassing 2013).

### Chapter 2

Figure 27: Panoramic view of Rosema & Era Brickworks in Silverton, Pretoria. A near replica of the Old Rosema & Klaver Brickworks quarry in Monument Park. Photographed by Elita van Graan (2013).  
 Figure 28: Pretoria's development over time and the distribution of industry (Van der Merwe, 2013).  
 Figure 29: Transportation infrastructure within Pretoria (Van Graan, 2013).  
 Figure 30: Areas surrounding Monument Park and the Rosema site that are currently green open space or designated green space for conservation, such as Groenkloof (North west) and Rietvlei (South) Nature Reserves (Van Graan, 2013).  
 Figure 31: Land uses surrounding Monument Park and the Rosema quarry site (Van Graan, 2013)  
 Figure 32: RSDF proposal for Monument Park by the city of Tshwane (Van der Merwe, 2013).  
 Figure 33: The Old Rosema & Klaver Brickworks Quarry, situated in Monument Park (Author, 2013).  
 Figure 34: Context surrounding the Old Rosema & Klaver Brickworks Quarry (Author, 2013).  
 Figure 35: Original building locations (light orange) and existing ruins (dark orange) (Author, 2013).  
 Figure 35a: Building remains left on site. Photographed by Author (2013).  
 Figure 35b: Remaining columns of what once formed

the 'droogoonde'. Photographed by Ingmar Büchner (2013).  
 Figure 35c: Ruins within the dense vegetation. Photographed by Ingmar Büchner (2013).  
 Figure 35d: The remains of the water tower. Photographed by Ingmar Büchner (2013).  
 Figure 36: Movement patterns on site (Author, 2013).  
 Figure 36a: Walkway visible from terrace. Photographed by Author (2013).  
 Figure 36b: Walkway on second terrace. Photographed by Author (2013).  
 Figure 36c: Walkway over bare shale area. Photographed by Author (2013).  
 Figure 36d: Vehicular road built with bricks. Photographed by Author (2013).  
 Figure 36e: Main vehicular access road to site. Photographed by Author (2013).  
 Figure 37: Location of viewpoints on site (Author, 2013).  
 Figure 37a: View from northern terrace. Photographed by Author (2013).  
 Figure 37b: View from south eastern terrace. Photographed by Author (2013).  
 Figure 37c: View from the Rosema & Klaver Brickworks quarry site of the Voortrekker Monument. Photographed by Ingmar Büchner (2013).  
 Figure 38: Existing geology on site (Author, 2013).  
 Figure 38a: Groundwater situated in dolomite layer (Blue) with shale layer located on top of it (Orange) (Dippenaar, 2013).  
 Figure 38b,c,d: Various areas across the site indicating shale soil conditions. Photographed by Author (2013).  
 Figure 39: Vegetation types and specific exotic plant species located on site (Author, 2013).  
 Figure 39a-7: Various invasive plant species identified on site. Photographed by Author (2013).  
 Figure 40: Direction of drainage on site and possible storm water management strategy above (Author, 2013).  
 Figure 41: Indication of warm and cold slopes on site creating different microclimates (Author, 2013).  
 Figure 42: Diagrams indicating main issues identified, as well as possible objectives or vision countering the main issues (Groupwork, 2013).

## Chapter 3

Figure 43: View of ruins. Photographed by Ingmar Büchner (2013).  
 Figure 44: Response to RSDF (Van der Merwe, 2013).  
 Figure 45: The proposal of de-centralised colonies of industries throughout the city (Van Graan, 2013).  
 Figure 46: Proposed storm water strategy (Author, 2013).  
 Figure 47: Final Framework Proposal, in plan (Author, 2013).  
 Figure 48: Location of individual design areas (Author, 2013).

## PART 2:

### Chapter 4

Figure 49: Ruins between the tall grasses. Photographed by Author (2013).  
 Figure 50: Current landscape experience as identified by the Author (Author, 2103).  
 Figure 51: Identified places on site with specific characters (Author, 2103).  
 Figure 52a: Plan of Stowe, 1739 (Hunt 1992:78).  
 Figure 52b: Stowe: the Temple of British Worthies (Hunt 1992:80).  
 Figure 52c: Stowe: the Temple of Ancient Virtue (Hunt 1992 :80).  
 Figure 53: Diagram illustrating comparison between the beautiful, the sublime, and the picturesque (Author 2013).  
 Figure 54: Claude Lorrain, Landscape with Apollo, the Muses, and River God (Hunt 1992:129).  
 Figure 55: Francios Vivares, engraving of a waterfall in Bolton Park, Yorkshire, 1753 (Hunt 1992: 131).  
 Figure 56: *Landskip* (Dee 2001:10).  
 Figure 57: *Landschaft* (Dee 2001:16).  
 Figure 58: W.J.T Mitchell's distinction between picture & image (Corner 1999a:160-161). Diagram by Author (2013).  
 Figure 59a & 59b: Eidetic Operations (Corner 1999:248).  
 Figure 60: Past eidetic operations (Author, 2013).  
 Figure 61: Present eidetic operations (Author, 2013).  
 Figure 62: Future eidetic operations (Author, 2013).  
 Figure 63: Diagrams illustrating eidetic operations

(Author, 2013).

Figure 64: Diagram illustrating main eidetic operations; movement, textures, and defined spaces (Author, 2013).

### Chapter 5

Figure 65: Panoramic view of water body from northern terraces. Photographed by Author (2013).  
 Figure 66: Initial intuitive master plan design (Author, 2013).  
 Figure 67: Drawing illustrating author's design development of master plan (Author, 2013).  
 Figure 68: Proposed master plan design (Author, 2013).

### Chapter 6

Figure 69: View from western edge of water body. Photographed by Author (2013)  
 Figures 70a-p: Visual exploration. List of references provided in bibliography.  
 Figure 71: Land-water connection (Author 2013).  
 Figure 72: Appropriate focus area location (Author 2013).  
 Figure 73: Sun angle study (Author, 2013).  
 Figure 74: Design Development of focus area (Author, 2013).  
 Figure 75: Proposed swimming area design, not to scale (Author, 2013).  
 Figure 76: Section a-a, not to scale (Author, 2013).  
 Figure 77: Section b-b, not to scale (Author, 2013).  
 Figure 78: Section c-c, not to scale (Author, 2013).  
 Figure 79: Ablution facilities, design development, not to scale (Author, 2013).  
 Figure 80: Bio-filter and floating wetland detail exploration, not to scale (Author, 2013).  
 Figure 81: Final sketch plan, not to scale (Author, 2013).  
 Figure 82: Detailed sketch plan, not to scale (Author, 2013).  
 Figure 83: Lighting plan for sketch plan area, not to scale (Author, 2013).  
 Figure 84: Section A-A, not to scale (Author, 2013).  
 Figure 85: Perspective from the floating wetlands towards the beach area, not to scale (Author, 2013).  
 Figure 86: Perspective of visitors walking down the terrace towards the swim area, not to scale (Author, 2013).

## Chapter 7

Figure 87: Panoramic view from south eastern terrace. Photographed by Author (2013).  
 Figures 88a-m: Photographs of ERA Brickworks in Eersterust. Photographed by Ingmar Büchner (2013).  
 Figures 89a-m: Photographs of historical remains and current status on site. Photographed by Author (2013).  
 Figures 90: SVcb 10 Gauteng Shale Mountain Bushveld: Typical semi-open bushveld on rocky slope with a variety of woody species, including *Cussonia spicata*, *Euclea crispa* and *Dombeya rotundifolia* in Groenkloof Nature Reserve, Pretoria. The tall grass in the foreground is *Hyparrhenia dregeana* (Mucina & Rutherford 2006:467).  
 Figures 91a-n: Planting strategy for Terramesh retaining wall (PlantzAfrica 2013).  
 Figures 91: Water spaces and bio-filter location and sizes (Author, 2013).  
 Figures 92a-k: Planting strategy for bio-filter structure (PlantzAfrica 2013).  
 Figures 93: Illustration of floating wetland system and the matrix structure (Landscape SA 2009: 32).  
 Figures 94a-c: Hillcrest Municipal Swimming Pool in Hillcrest, Pretoria. Photographed by Author (2013).  
 Figures 95a & b: Zoomed in view of ablution facilities, changing stalls, and showers. Indicating female, male, and unisex toilets (Author, 2013).  
 Figures 96: Section BB, through pedestrian bridge, bio-filter, and diving platform. Not to scale. (Author, 2013).  
 Figures 97: Section CC, through the beach area, walkway, bio-filter and life guard tower, tuck shop and deeper swim area. Not to scale. (Author, 2013).  
 Figures 98: Detailed section through children's swim area, walkway, and bio-filter. Not to scale. (Author, 2013).  
 Figures 99: Detail through water outflow from submersible pump into swim area. Not to scale. (Author, 2013).  
 Figures 100: Detail of steps into swim area. Not to scale. (Author, 2013).  
 Figures 101: Detail of bio-filter structure and access into water. Not to scale. (Author, 2013).

## PROLOGUE



She remembers the fear she felt of entering an unknown place. A place renowned for being dangerous, filled with unfamiliar faces and strange languages. When nothing can be seen from the outside a curiosity gives one the courage to enter anyway.

*It was quiet.*

With time, ease took the place of fear and exploration became the next adventure. Trees formed clusters of dark green colours and remains of buildings protruded from the dense vegetation. Hard concrete strips formed patterns between the red yellow soil and light green grass. Memories of spaces and people reflect in the surfaces and remaining columns.

*Further, in the back, a depth was felt.*

There is water. Lush, green grass, cut short, meats a light blue shade. It was unexpected, as if a treasure was found. The water became a presence. Here, silence got a new meaning. Time did not exist. It felt as if she stood on the edge of nothing and everything at once. In the distance the edges of the water were defined by land, forming steep cliffs. Someone lived there in the distance, up high.

*She left the water and headed south.*

Bricks, neatly laid side by side, created a red road between the yellow tall grasses, leading her on. As the earth raised the grass disappeared and single trees circled a vast opening. There was nothing else. Just the openness was felt.

*She went home.*

These specific moments stays with her now. Mere glimpses. Unidentified feelings towards a place. It seems foolish, but that day in those moments a voice was heard, one that spoke to her soul and remains a mystery.

## PROLOGUE DESCRIPTION

*The author recalls her experience on an old quarry site in Monument Park, in the east of Pretoria. Here she felt hesitant to enter the site, a place that seemed dangerous and unwanted by the community. Her experience was anything but. She felt connected to specific places within the landscape and during her journey through the landscape a sublime emotion was present. The emotion uncomfortably lured her through veld areas, ruins, dense forest vegetation and finally towards a treasure. A vast water body laid before her, encircled by steep cliffs.*

*When she left this place certain memories stayed with her. These memories create various emotions within her whenever she recalls her first visit to the place. She wonders why she feels so connected to this place now and what inspired her initial connection to specific landscape features.*

*Part One and Part Two should be read as a whole. Each part classifies different elements focused on during the design process. Part One describes a framework response towards an urban issue, where Part Two explains a phenomenological design approach towards the master plan and the focus area, and finally investigates how such an approach can be achieved throughout technical resolution and re-establishment strategies in order to achieve specific landscape experiences.*



## PART I

Countering urban sprawl with operative  
landscapes

001

INTRODUCTION  
The Real World Problem



Figure 5: View of quarry water body from southern terraces.  
Photographed by Author (2013).

## BACKGROUND TO PROBLEM

### 1.1 URBAN SPRAWL

During recent years the term “urban sprawl” has been used to describe a complex pattern of rapid expansion of metropolitan areas consisting of land use, transportation, social and economic development (Frumkin 2002:201). Due to the extension of cities into rural areas, large expanses of land are established as low-density zones. This result in zones where land uses such as housing, offices, public space, retail stores, recreational facilities and industry are separated from each other and should, therefore, in response be connected through extensive roads. Most suburban dwellers thus require the use of a car to buy something as simple as the daily newspaper, bread, or milk, while living in areas of homogeneous architectural and recreational characteristics (ibid).

Cities are extending into rural areas causing industrial zones, previously demarcated on the outskirts of the city (Landman 2010:9), to become a part of the neighbourhoods mostly consisting of low density housing. As industries close down due to depleted resources or being unwelcome within these neighbourhoods, vacant plots are left behind. An urban pressure exists from the city’s administration and stakeholders’ will to urbanise these zones (Loures 2012:1) with proposed shopping centres or housing strategies, such as the popular gated communities.

### 1.2 CONTEMPORARY OBJECTIVES FOR URBAN SPRAWL

How urban sprawl caused rapid changes in human development and environmental systems in the 21<sup>st</sup> century, it is clear that current urban form reveals inadequacies in its modern planning

methods. Postmodern urbanism made an effort to address issues on modern planning methods, but failed in manipulating form with its nostalgic character, instead of attending to current uncertainties. It is therefore argued that a need exists for operative landscapes to serve in human and ecological needs, and that providing cities with simply aesthetic landscapes are no longer sufficient (Obara 2013:1,3).

An urgency currently exists, according to Julia Czerniak, for landscape architects to address the “conceptualisation of design and planning for urban landscapes that draw from an understanding of landscape’s disciplinarity (history of ideas), functions (ecologies and economies), formal and spatial attributes (natural and cultural), and processes (temporal) impacting many concerns” (in Obara 2013:7). Operative Landscapes can therefore be the name for this vision that Czerniak proposes for urban landscapes, summarising that it is an active, working, and multi-functional landscape.

Current projects with a focus in landscape urbanism, a term coined by Charles Waldheim in 1997 (Obara 2013:4), have shown an understanding of operative systems, a bridging of cross-disciplines, a commitment to long-term investment, a multiplicity of scale in focus, and comprehensive documentation and monitoring of ecological, hydrological, and social processes. For this reinvention of landscape architecture into a choreography of disciplines and topographies and a broad synthesis, it is important that before the process of design can start, inevitably the design of process must occur (Obara 2013:1,3,7).





Figure 6: Urban sprawl, Los Angeles, California (Berger 2006:23).



Figure 7: Gated communities, Houston, Texas (Berger 2006:31).



Figure 8: Aerial view of Fresh Kills Park, by James Corner/Field Operations. An example of an operative landscape (Czerniak *et al.* 2007:117).

### 1.3 PROBLEM STATEMENT I

Due to urban sprawl, post-industrial landscapes are under pressure for redevelopment. Urbanising these zones usually results in gated communities, causing separation within neighbourhoods, lack of urban densification, and a decrease in available communal open space and healthy ecologies.

### 1.4 THESIS STATEMENT I

By focussing on landscape, in relationship with ecological, hydrological, and social processes as departure points, one can ensure a final designed landscape resulting in recreation for citizens within outdoor environments. A post-industrial landscape can be re-generated into a sustainable operative landscape without taking away open space, nor compensating for housing, or forgetting the history of the site.

### 1.5 CLIENT & USER IDENTIFICATION

The development of an urban node on a post-industrial site, currently under pressure for redevelopment, is aimed at the surrounding community and regional visitors, providing them with easily accessible resources, recreation and open space for a more sustainable lifestyle. Such a regenerative development will focus on ecology and recreation, and will be a joined scheme between:

City of Tshwane and Government Departments such as:

- Department of Parks and Recreation
- Department of Environmental Affairs

### 1.6 RESEARCH METHODOLOGY

A combination of several research methods will be used throughout this dissertation:

#### For Part I:

- A descriptive survey method will be used in order to investigate and observe the site and its surroundings through photographs,
- An analytical survey will be conducted during the site analysis and will include mapping and data analysis,
- A historical method will include an investigation of the history and heritage of the site's cultural, natural, and industrial history. This method will be conducted through photographic information.

### 1.7 URBAN SPRAWL WITHIN SOUTH AFRICA

Urban sprawl, as described by Frumkin (2002:201), is apparent in South Africa and its major cities. The history of South African government and its city planning has contributed to urban layout issues experienced today.

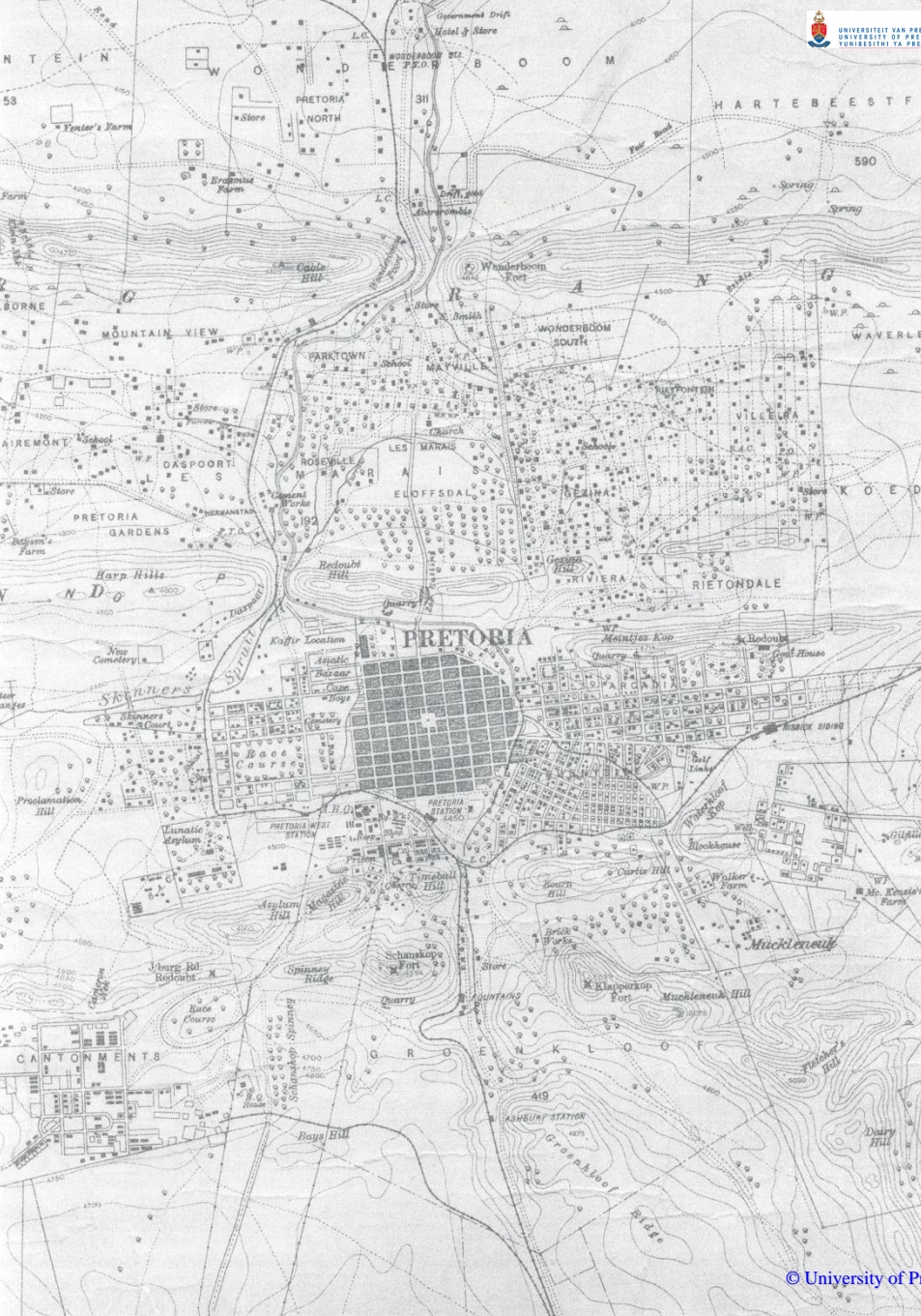
#### 1.7.1 How South African cities were characterised:

During the post-1960's, a period known as the Apartheid, South African cities, including Pretoria, could be identified by their layout due to involuntary removals of 'incorrectly' situated black people, newly formed homelands and deliberate retribalisation that caused large scale socio-spatial engineering (Landman 2010:9). Assisting in the construction of the Apartheid city, the planners in South Africa successfully made use of modern

town planning ideas (Dewar & Uitenbogaart, 1991). African populations were concentrated on the edges of the city, disconnected from the well-developed suburbs through the use of buffer strips which usually consisted out of green belts, industrial zoned areas and rapid transport routes (Landman 2010:9).

Landman (2010:9) explains how spatial features resulted due to the above mentioned development strategies and how they characterised South African cities during the early nineties. One of the spatial features is known as 'low-density sprawl', establish in three processes, and determined the pattern of growth in cities. These three processes are as follows (ibid):

- **Speculative sprawl:** involves prosperous people looking to privatise their amenities and so become the target group for developers. These well-established people specifically targeted places of beauty to build their privatised 'escapes';
- **Fragmentation:** a cellular development pattern became visible within cities due to development occurring in relatively discrete pockets or cells, caused by separation frequently instigated by freeways or buffers of open space;
- **Separation:** refers to the separation of land uses, income groups, and races to the greatest extent possible. The philosophy of urban management focused mainly on the separation of places of work and residences to such an extent that the dominant urban land-use pattern can be described as a series of



relatively homogeneous ‘blobs’ of various uses connected by rapid transport routes. This resulted in great numbers of poor people settled on the peripheries of the city, increasingly disconnected from urban opportunities.

Speculative sprawl specifically refers to the gated communities, or better known as estates. These ‘communities’ ensure peaceful lifestyles within safe environments, but result in spaces excluding surrounding communities with high walls or fences and privatising parts of cities (Blakley & Snyder 1998:22). The speculative sprawl could also contribute to the other two processes of fragmentation and separation. Separation is caused by gated communities developed for well-established citizens where gates indicate a barrier of status (Tucker 1998:24), contributing to separation between income groups and races as described above by Landman (2010:9).

South African cities are characterised by their historical past and the effects of city planning during years of urban growth. One example of such a city within South Africa is the capital city, Pretoria.

Figure 9: City development of Pretoria, and its cultural demarcated areas (Van der Waal Archives, 2013).

### 1.7.1.1 The origin of Pretoria:

The origin or place making of the city of Pretoria was influenced by universal, cultural and contextual aspects (Jordaan 1989:26). The city form is a result of an interpretation of a classical landscape, where landscape features such as the surrounding mountains, rivers, valleys, fountains and 'poorte' were taken in consideration for the initial city layout (ibid).

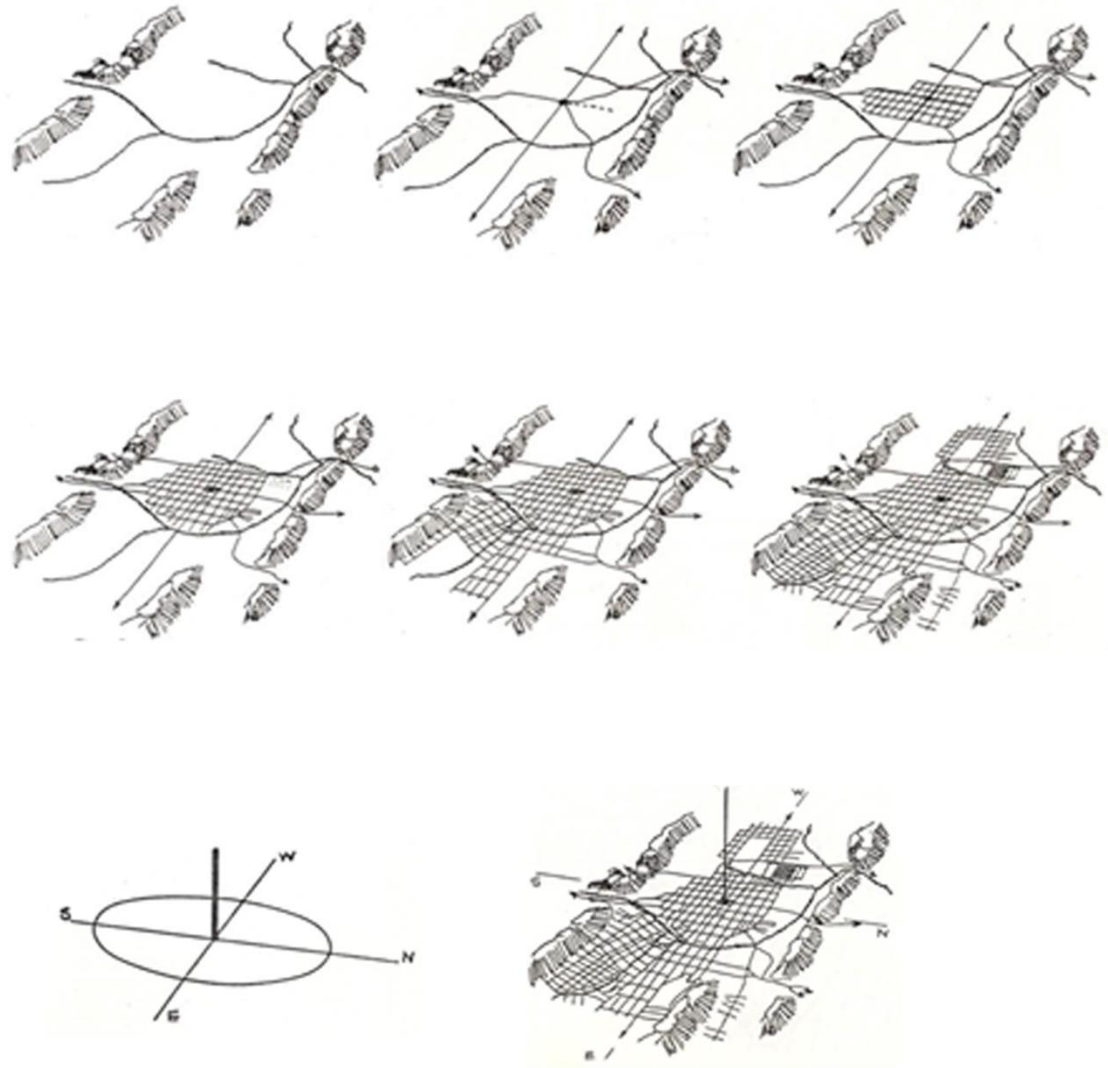


Figure 10: Pretoria's form due to contextual aspects (Jordaan 1989:26).

1.6.1.3 Urban growth in Pretoria:

GROWTH OF PRETORIA 1900-1939



GROWTH OF PRETORIA 1900-1959



GROWTH OF PRETORIA 1900-1999



Figure 11: Growth of Pretoria (TOSF vol.1 2005:20).

1.6.1.4 *Speculative sprawl* within Pretoria:

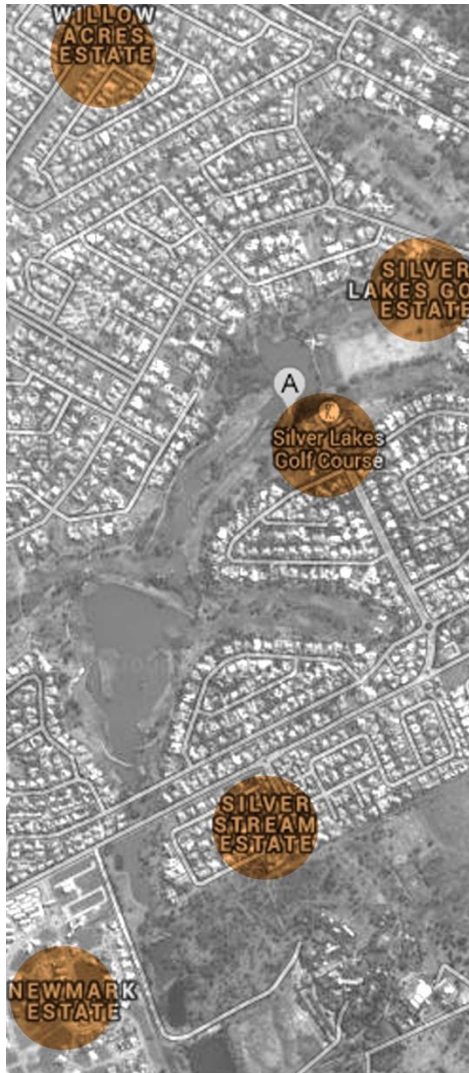


Figure 12: Speculative sprawl indicated through gated communities found in Pretoria (Author, 2013).

These figures indicate how Pretoria developed over the years and also show various open spaces now found within built-up areas (visible in Figure 11). Several of these open spaces are 'untouched' landscapes while others have been utilised in some way before they were abandoned. These spaces are known as 'wasted places,' defined as abandoned or contaminated landscapes by Alan Berger (2006:14).

## 1.8 SITE SELECTION

Wasted places (abandoned or contaminated sites (ibid)) exist within Pretoria (Di Monte 2011:42-46). Several of these landscapes are post-industrial sites. In order to select a site to further investigate as an urban densification proposal in collaboration with ecology, recreation and further phenomenological design possibilities, a set of criteria was selected. The current site should fall under the classification of 'post-industrial' as set out in the definition of terms. This post-industrial site will have to be situated within a low-density housing neighbourhood and be under pressure for redevelopment. Another criterion is that the post-industrial site should be surrounded by a neighbourhood that came into existence due to the processes explained by Landman (2010:9) as speculative sprawl, fragmentation and separation.

### 1.8.1.1 Identified neighbourhoods characterised by *speculative sprawl*:

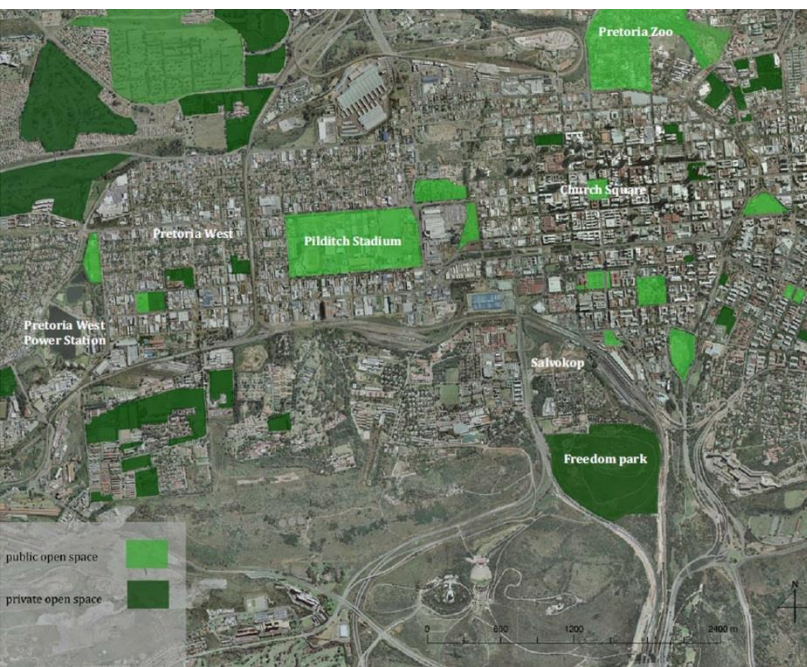
Waterkloof Ridge, Waterkloof, and Monument Park are suburbs within Pretoria resembling this process. These suburbs are home to wealthy families and at one time provided scenic views over the city. Unfortunately, due to urban sprawl, open spaces surrounding these neighbourhoods are also now covered in housing. Some neighbourhoods even contain industrial areas once only found on the outskirts of the urban edges (Landman 2010:9). Some of these industrial areas have become neglected as industries closed down over the years, leaving large vacant, underused plots, within low-density residential areas, as can be found within Monument Park.

Monument Park is, therefore, an example of a neighbourhood that originated due to its scenic location, distinguished from the rest of the city

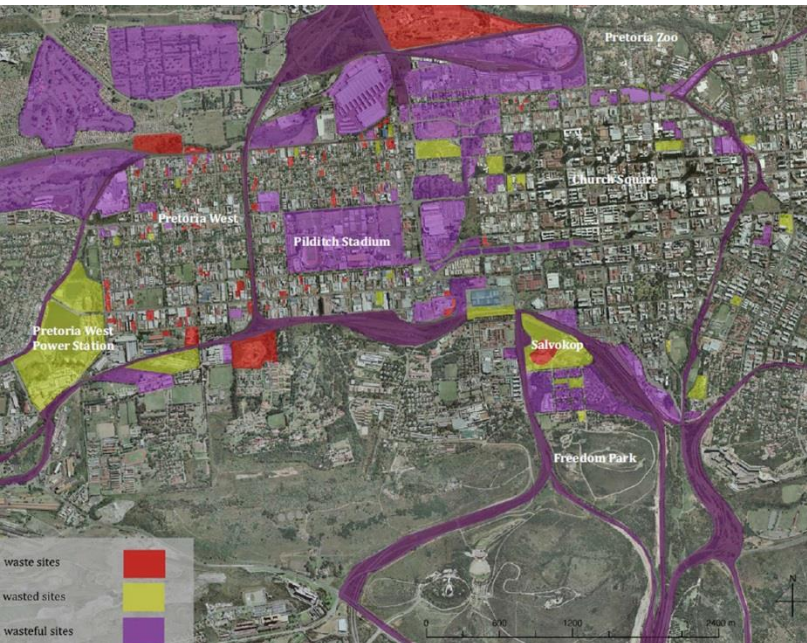
and its citizens by class, income, and location. This occurrence resembles fragmentation as well, because it functioned as a cellular development operating as a discreet pocket separated by landscape elements, such as the ridge north of Monument Park, separating Pretoria CBD and the more wealthy and exclusive neighbourhoods to the south. Due to urban sprawl, these neighbourhoods gradually became surrounded by low-density housing and developed further to the south past the industrial zones. Industries closed down over the years, leaving vacant plots within this neighbourhood.

Loures (2012:1) explains how different tendencies can exist around abandoned industrial landscapes like these. In this scenario, pressure exists from the city's administration and stakeholders' will to urbanize these zones, as stated previously, while there is an increasing public consciousness of the importance to protect industrial heritage, as well.

The neglected industrial spaces once formed part of the city's economy and created opportunities for employment. It is widely acknowledged that cities are cultural entities that contain depictions from the past, via the present, to the future, running through the entire cultural evolution of the "city as object", and that the history of the contemporary city was influenced by the increase of different visions, different urban models and mainly by significant changes in consumption and production patterns (Loures 2012:1). The "globalisation" of industry had a profound effect on industrial areas all over the world (as well as in South Africa's capital city, Pretoria), contributing to the presence of several derelict and underused post-industrial landscapes.



a



These landscapes decrease the development potential and quality of life, and became economically disadvantaged, environmentally degraded, and socially troubled through industrial contamination. It is clear that reclamation projects should enable the redefinition of these landscapes, possibly through community-based, interdisciplinary action that integrates multi-functional long term solutions based on cultural, social, economic and ecological objectives (Loures 2012:1-2).

Neglected landscapes, such as these post-industrial landscapes, are therefore under pressure for redevelopment because of the issue they become within neighbourhoods. Unfortunately, the vision for redevelopment is currently mostly focussed on more housing or the favoured gated communities, which cause additional separation within communities and contributes to further low-density sprawl. The aim should therefore be as Loures (2012:1-2) explains above; towards multi-functional landscapes with long term goals built on social, economic, cultural and ecological objectives.

Figure 13a: Open space in Pretoria (Di Monte 2011:41).  
Figure 13b: Wastelands in Pretoria (Di Monte 2011:46).

### 1.8.1.2 Monument Park's post-industrial landscape:

Monument Park is situated south east of Pretoria CBD (Central Business District), and is located on a ridge area providing beautiful views of the surrounding neighbourhood and nearby CBD. A large vacant plot of approximately 50 hectares is situated in the middle of the neighbourhood that was once a brickworks belonging to a company named Rosema & Klaver (edms) Bpk..

### 1.8.1.3 The history of Rosema & Klaver Brickworks Quarry and how Monument Park originated:

Today this piece of land forms part of the Monument Park neighbourhood located next to the Waterkloof and Waterkloof Ridge areas. These three neighbourhoods are situated on the eastern side of Pretoria and are known as suburbs rich in history and beauty. The original Waterkloof farm started back in the 19<sup>th</sup> century and later on these suburbs were known as the most desired, high class residential areas in South Africa (SATSA 2011). During the Apartheid regime the Afrikaner elite built their homes here where magnificent views overlooking the City Centre and the Union Buildings were present (ibid)

A newspaper article from the archives of the current Rosema Era Company in Monument Park explains how Roelf Rosema and Dirk Klaver travelled from the Netherlands and arrived in South Africa during 1935. Both men's fathers were builders in Groningen, Friesland (Frisia), and after a short period of working for others, the two sons formed a partnership and established their own construction business in Pretoria.

A few years later they started producing their own bricks and named their company Rosema & Klaver (edms) Bpk. They bought part of the farm, Waterkloof, near Pretoria, and officially started their own brickworks in 1942. During World War 2, Roelf and Dirk joined the Netherlands Army and served their country until the end of the war. After their return to South Africa, they continued working in construction and reinstated their brickworks (Rosema Era Archives, 2013).

During 1951 they bought their first wire cut brick-making machine which improved production significantly. A kiln, able to operate 24 hours a day, was built in 1958 and in 1960 a second kiln was constructed. During April 1964 their monthly brick-production rate exceeded the 5,000,000-mark and continued increasing during the following year to a total of 60,000,000 bricks produced by 30 June 1965 (Rosema Era Archives, 2013).

Roelf Rosema was interested in the technical aspects of the brickworks while Dirk Klaver attended to the administrative and financial aspects of the business. Later on a third director joined the company, Mr. C. M. T. Chaplin, a chartered accountant, in order to assist in the management of the fast growing business (Rosema Era Archives, 2013).

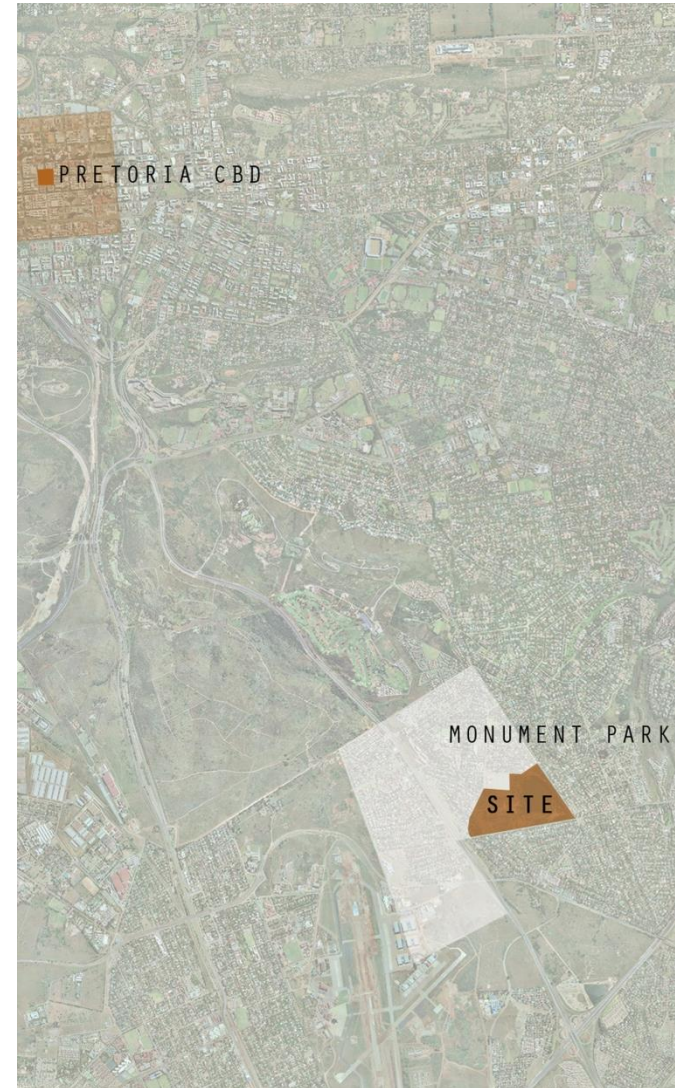


Figure 14: Location of Monument Park, in relation to Pretoria CBD (Author, 2013).



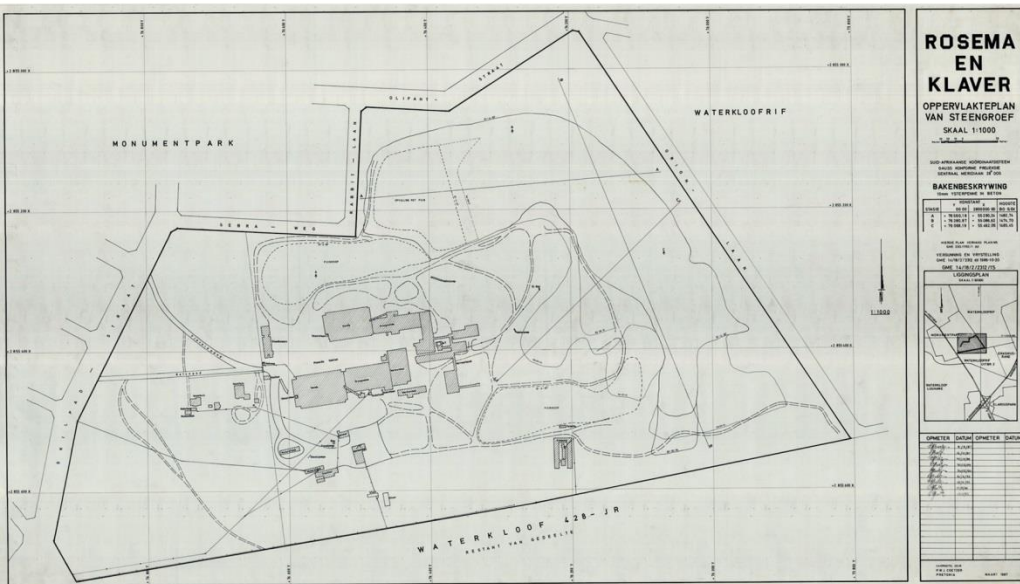
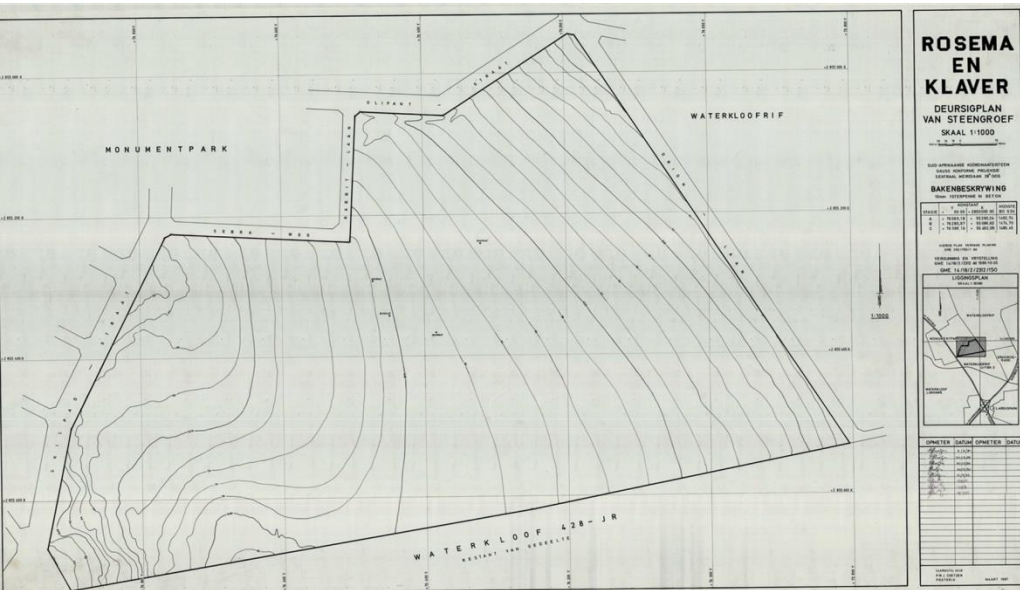


Figure 15: The original landform before any excavations started (Rosema & Era Archives, 2013).

Figure 16: The original layout of the Old Rosema & Klaver Brickworks quarry (Rosema & Era Archives, 2013).



17

Figure 17: Roelf Rosema (left) and Dirk Klaver (right) (Rosema Era Archives, 2013).

Figure 18: Excavation of clay on site (Rosema Era Archives, 2013).

Figure 19: Workers loading bricks at the Rosema & Klaver Brickworks (Rosema Era Archives, 2013).

Figure 20: View of Rosema & Klaver Brickworks (Rosema Era Archives, 2013).

Figure 21: Wire cut brick making machine bought in 1951 (Rosema Era Archives, 2013).

Figure 22: Mr. C.M.T. Chaplin (Rosema Era Archives, 2013).



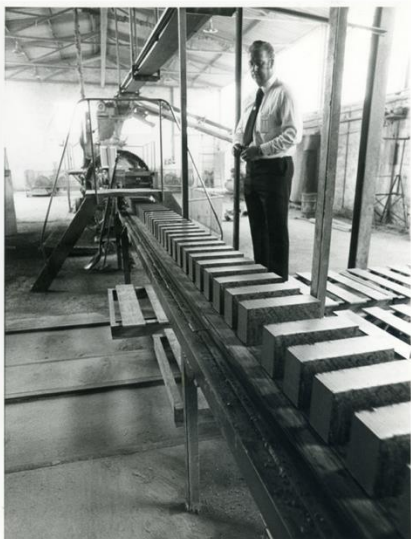
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Figure 23: Developers advertising proposed developments for the Rosema quarry site. Photograph by Author (2013).



Figure 24: Main entrance gate to site closed. Photograph by Author (2013).



Figure 25: Fish caught on site by fisherman (Bassing 2013).



Figure 26: Canoeing on site by fisherman (Bassing 2013).



**1.8.1.4 Current context and situation on site:**  
The brickworks continued production up to 1993 when a law suit from the surrounding neighbourhood convinced the company to shut down their Monument Park quarry (Rosema Era Archives, 2013).

When activity in the quarry stopped and groundwater was no longer pumped out to ease in excavation, the quarry started to fill up with fresh water. Exotic plant species established themselves over most of the exposed soil. Numerous estate developments have been proposed for the site (see Figure 5). Though the site is fenced off, it is known to be unsafe by the local neighbourhood due to a few vagrants living around the edges of the quarry.

Though a stigma exists around the safety of the quarry, still a few adventurous fishermen visit the site frequently and have been known to not be disappointed. The current site provides habitats for numerous fish, bird and plant species as well as other aquatic animals. Unfortunately, an increasing population of Black Wattle trees (*Acacia mearnsii*) are taking over the majority of the site, aiding in keeping its quiet and peaceful atmosphere but also causing damage to the soil structure and overall biodiversity of the area (Joubert 2001:70).

**In conclusion,** the Old Rosema & Klaver Brickworks Quarry is found to be a site that fulfils to the requirements stated in section 1.7. This post-industrial site, rich in history, represents a landscape that has endured extreme changes to its physical nature. In order to understand the true current, physical status of the site, a thorough context and site analysis is required.



002

## ANALYSIS

Old Rosema & Klaver Brickworks  
Quarry

Figure 27: Panoramic view of Rosema & Era Brickworks in Silverton, Pretoria. A near replica of the Old Rosema & Klaver Brickworks quarry in Monument Park.  
Photographed by Elita van Graan (2013).



## 2.1 INTRODUCTION

A group, from the Department of Architecture at the University of Pretoria, consisting of three architecture students (Elita van Graan, Tinus van der Merwe, and Ingmar Büchner) and one landscape architecture student (Author) collaborated on completing a context and site analysis of the Monument Park area, and, finally, a detailed analysis of the Rosema & Klaver Brckworks quarry. This information will be required in designing the joined framework proposal further explained in Chapter 003. The following site analysis has been divided into urban, social, and ecological aspects, of which the urban aspects have been categorised into macro-, meso-, and micro scales. Main identified issues and objectives will conclude the chapter.

## 2.2.1 URBAN ASPECTS

### 2.2.2 MACRO SCALE:

#### 2.2.1.1 Industrial heritage:

1900 - 1904



1908 - 1910



1930 - 1934



1939 - 1940





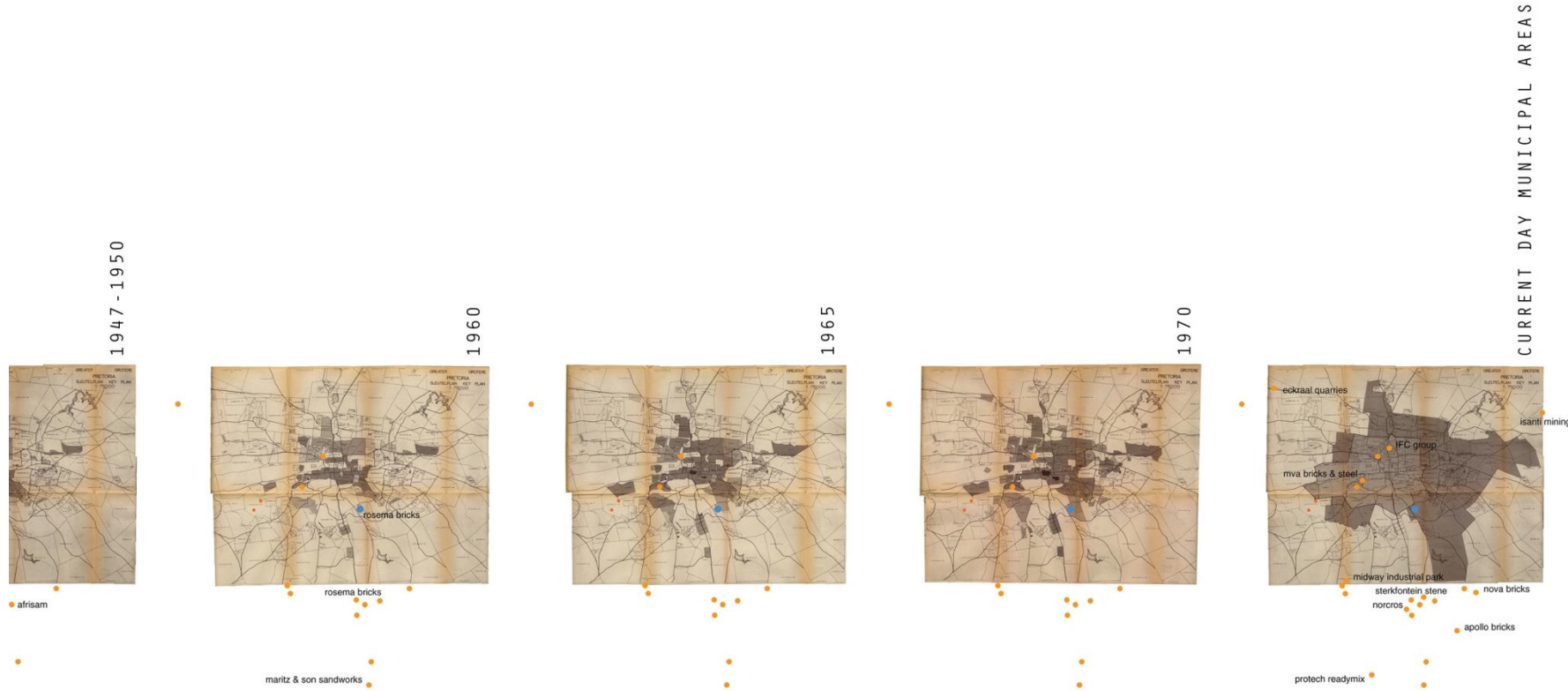
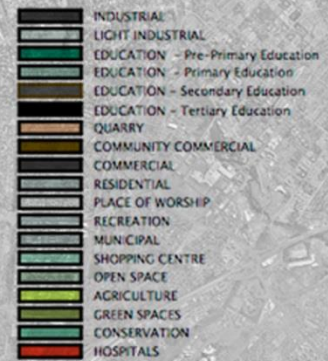
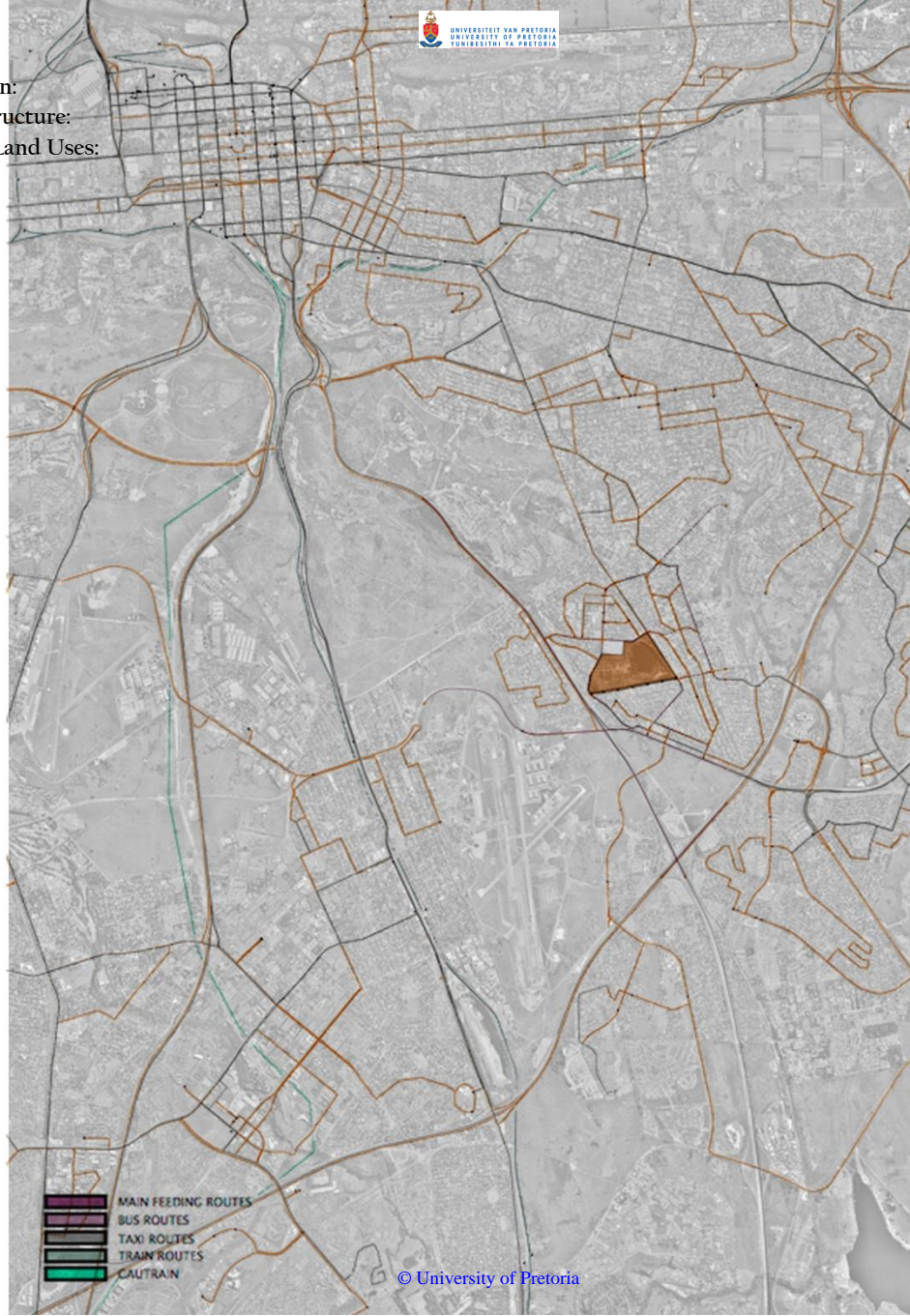
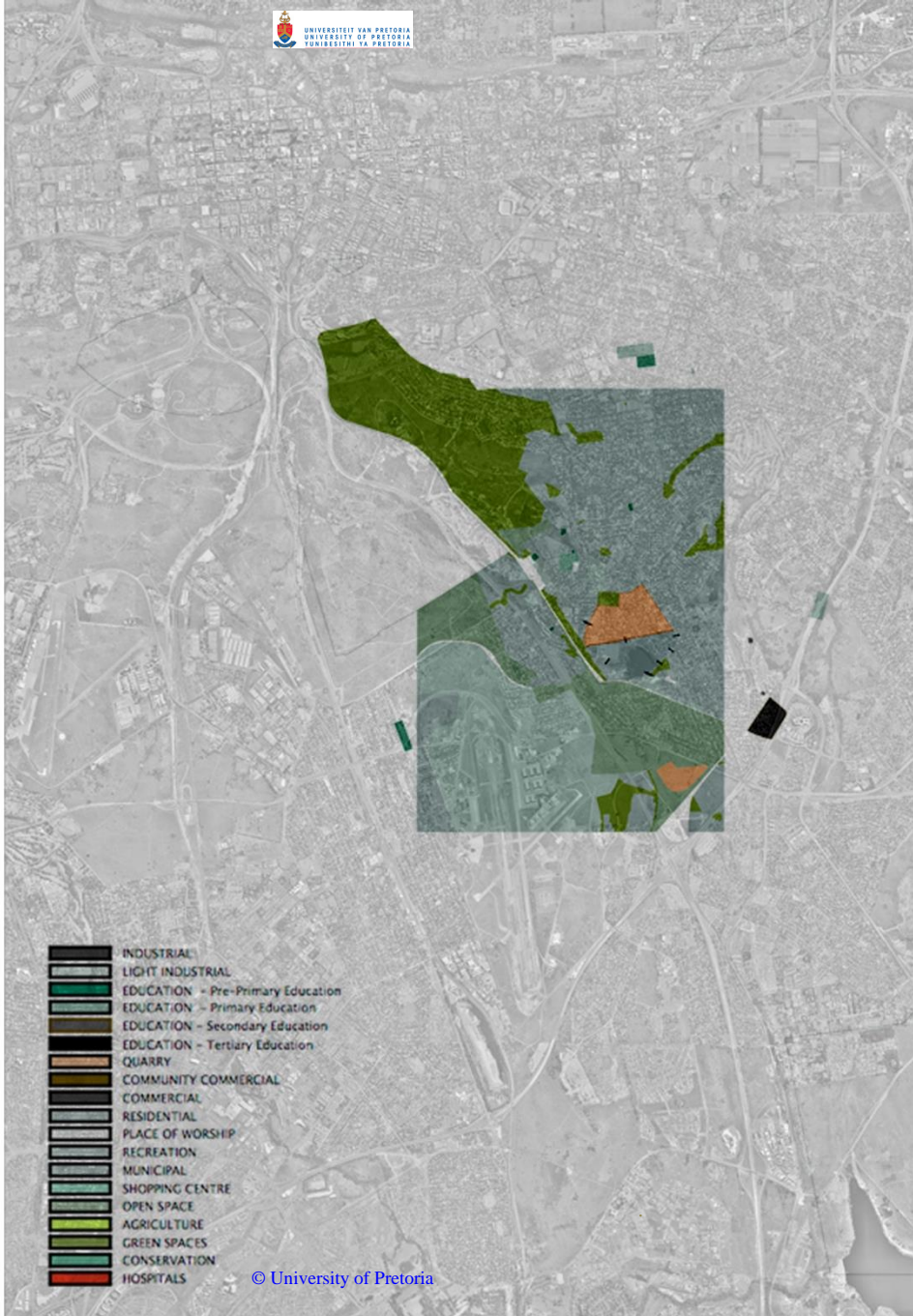


Figure 28: Pretoria's development over time and the distribution of industry (Van der Merwe, 2013).

- 2.2.1.1
- 2.2.1.2
- 2.2.1.3

Transportation:  
Green Infrastructure:  
Surrounding Land Uses:



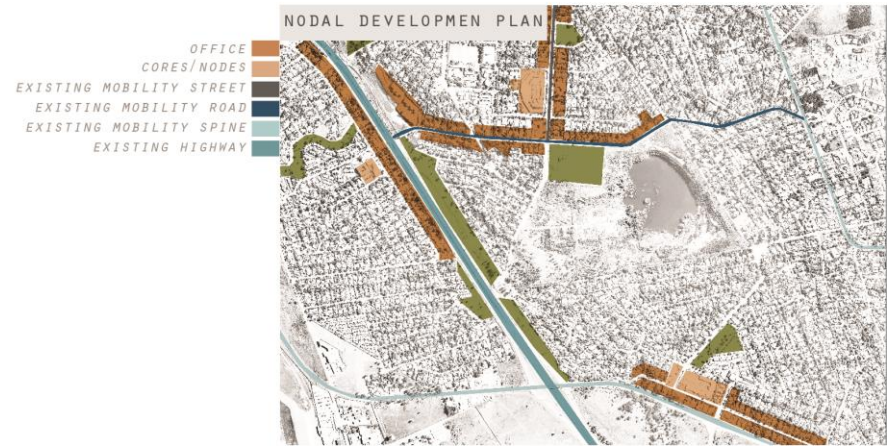
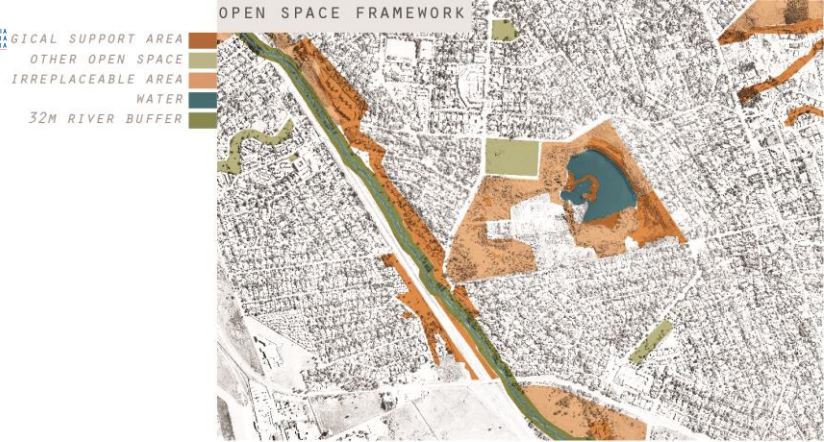


- INDUSTRIAL
- LIGHT INDUSTRIAL
- EDUCATION - Pre-Primary Education
- EDUCATION - Primary Education
- EDUCATION - Secondary Education
- EDUCATION - Tertiary Education
- QUARRY
- COMMUNITY COMMERCIAL
- COMMERCIAL
- RESIDENTIAL
- PLACE OF WORSHIP
- RECREATION
- MUNICIPAL
- SHOPPING CENTRE
- OPEN SPACE
- AGRICULTURE
- GREEN SPACES
- CONSERVATION
- HOSPITALS

Figure 29:  
Transportation infrastructure within Pretoria (Van Graan, 2013).

Figure 30:  
Areas surrounding Monument Park and the Rosema site that are currently green open space or designated green space for conservation, such as Groenkloof (North west) and Rietvlei (South) Nature Reserves (Van Graan, 2013).

Figure 31:  
Land uses surrounding Monument Park and the Rosema quarry site (Van Graan, 2013)



## 2.2.2 MESO SCALE

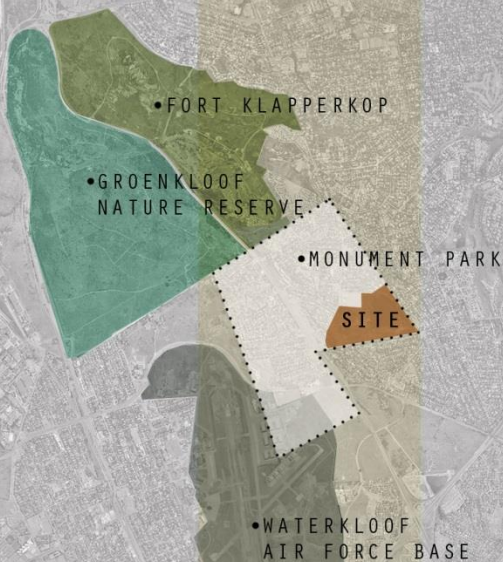
This section provides a brief description of another framework proposal for the Monument Park area. A more detailed explanation is provided in the accompanied booklet, *Silent Industry: Productive Park as Alternative Typology*.

### 2.2.2.1 RSDF PROPOSAL FOR MONUMENT PARK BY CITY OF TSHWANE:

The Regional Spatial Development Framework for the city of Tshwane proposes the following three main visions for the quarry site in Monument Park. For the purpose of this dissertation the three visions will be communicated visually, and detailed explanations are provided in the accompanied booklet, referred to above.

Figure 32: RSDF proposal for Monument Park by the city of Tshwane (Van der Merwe, 2013).

## 2.2.3 MICRO SCALE



### 2.2.3.1 Introduction to Rosema & Klaver Brickworks Quarry:

The Old Rosema & Klaver Brickworks Quarry site is situated in the south-eastern corner of the Monument Park neighbourhood. Significant places nearby are the Groenkloof Nature Reserve (located northwest of Monument Park), Waterkloof Air Force Base (located to the west of the neighbourhood), and Fort Klapperkop (located north of the neighbourhood).

Figure 33: .The Old Rosema & Klaver Brickworks Quarry, situated in Monument Park (Author, 2013).

## 2.3 SOCIAL ASPECTS

### 2.3.1 Context and current on-site activities:

The Rosema & Klaver Brickworks Quarry is currently edged by streets on three sides, Skilpad Road to the west, Elephant Road to the north, and Orion Avenue to the east. The site's southern edge is sided with housing and a gated community. The entire plot is vacant except for the north western corner which is currently occupied by six tennis courts and a clubhouse.

Most surrounding land uses are low-density housing, while the land uses edging the site on the north western corner are more retail-focussed. Skilpad Road and Elephant Road are busy streets due to the commercial and office buildings and activities.

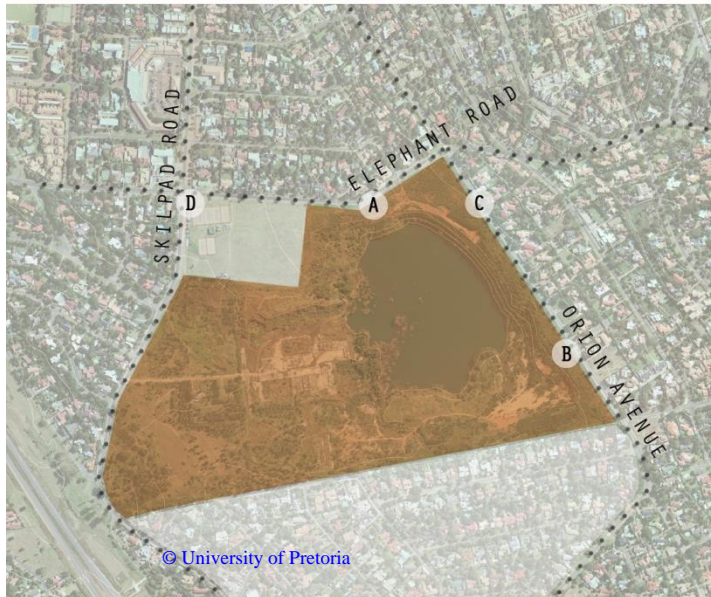
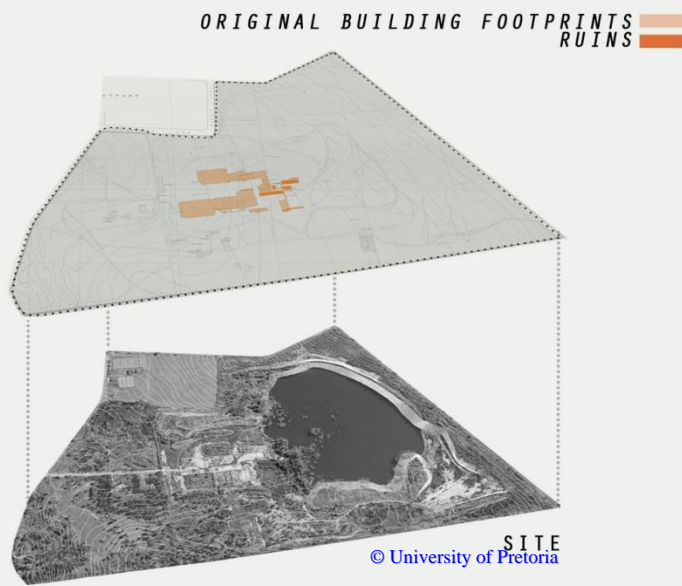


Figure 34: Context surrounding the Old Rosema & Klaver Brickworks Quarry (Author, 2013).



### 2.3.2 Historical remains:

Most of the Rosema & Klaver Brickwork's buildings were situated in the middle of the site, with the quarry located to the east of the buildings. The main buildings, wherein the manufacturing processes took place, were orientated to be north-facing. A few other smaller buildings, housing facilities, workshops, and shops are mostly situated in the southern part of the site. Today only the original slabs of the buildings still remain, as well as a few columns from the main buildings and most of the water tower.

Figure 35: Original building locations (light orange) and existing ruins (dark orange) (Author, 2013).

Figure 35a: Building remains left on site. Photographed by Author (2013).

Figure 35b: Remaining columns of what once formed the 'droogoonde'. Photographed by Ingmar Büchner (2013).

Figure 35c: Ruins within the dense vegetation. Photographed by Ingmar Büchner (2013).

Figure 35d: The remains of the water tower. Photographed by Ingmar Büchner (2013).

Figure 35e: The remains of the water tower. Photographed by Ingmar Büchner (2013).

### 2.3.3 Movement patterns:

Currently, movement patterns on site are influenced by the surrounding context, the site's fence creating a boundary with various access points, as well as a few of the remaining roads on site and the existing ruins. These existing movement routes are created by pedestrians only and formed by users in site. The users are illegal vagrants living on site in self-constructed shelters. The vagrants are living in some of the ruins and on the edges of the water and on some of the terraces located on the eastern edge of the water body. Mostly, the remaining roads, originally used by the trucks transporting materials to and from the quarry, are used by the pedestrians due to them being more open with less dense vegetation. Otherwise informal walkways have been formed for quick access to and from the site. A main access route still exists on site and is located on the western side of the site and runs from west to east, connecting the vehicular road (Skilpad Road) with the main gate to the site.

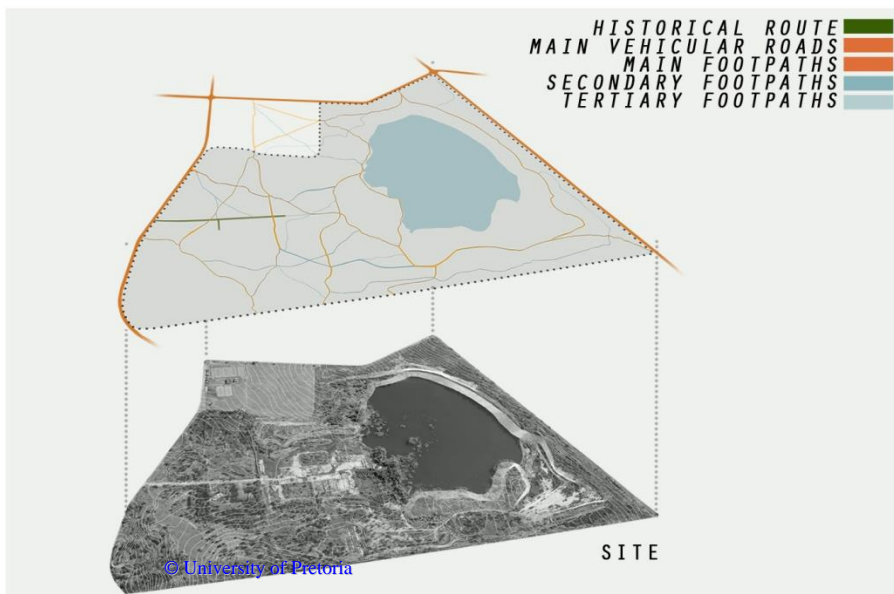
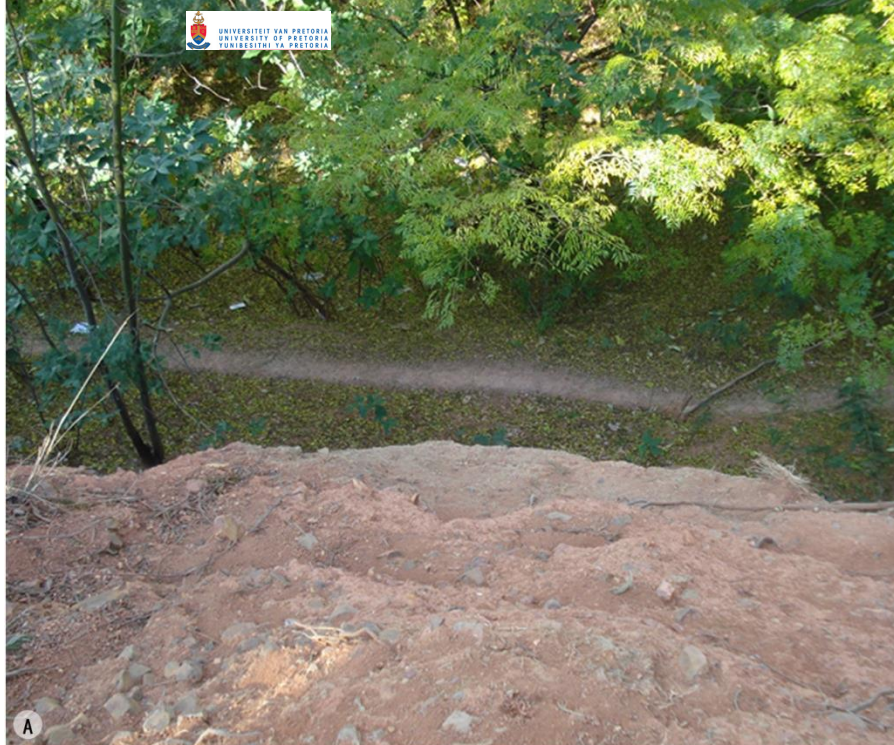


Figure 36: Movement patterns on site (Author, 2013).

Figure 36a: Walkway visible from terrace.

Photographed by Author (2013).

Figure 36b: Walkway on second terrace.

Photographed by Author (2013).

Figure 36c: Walkway over bare shale area.

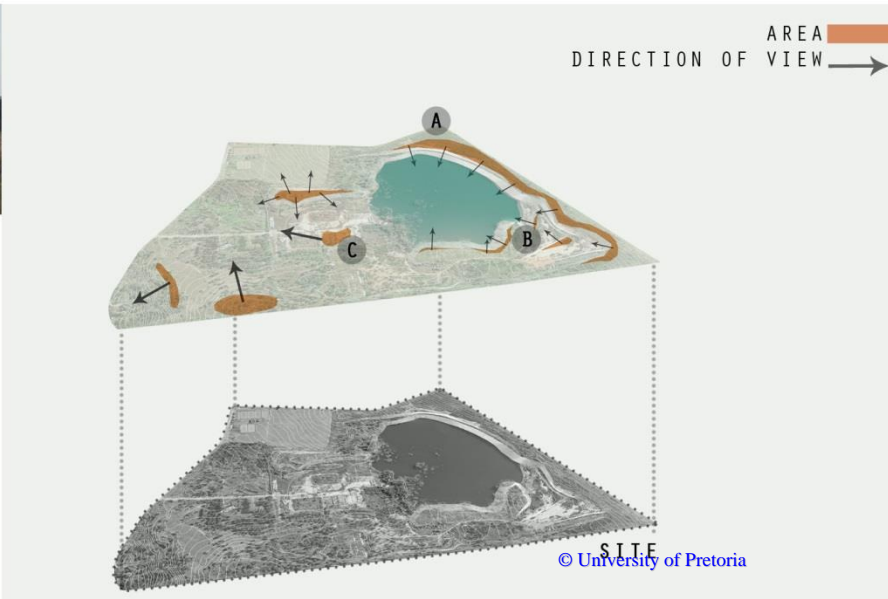
Photographed by Author (2013).

Figure 36d: Vehicular road built with bricks.

Photographed by Author (2013).

Figure 36e: Main vehicular access road to site. Photographed by Author (2013).





### 2.3.4 Viewpoints:

Due to the site's location in an area known for its admiration for views over the city of Pretoria, the site also provides such opportunities. Not only do the 'new' site conditions create a desire to explore the site and view the terraces and water body from various locations, but the site also provides a view of the Voortrekker Monument in the distance and the surrounding neighbourhood. When standing in the centre of the site surrounded by the ruins of the previous brick making industry, one will see the monument when looking in a north western direction. The Voortrekker Monument is a prominent cultural and architectural landmark in Pretoria. Designed by Gerard Moerdijk, this monument displays a post-colonial vigour in the drive for self-expression by the descendants of white settlers and was the envisioned centenary celebration of the *Groot Trek* of the Afrikaner culture in South Africa (Hardwick *et al.* 2007).

Figure 37: Location of viewpoints on site (Author, 2013).

Figure 37a: View from northern terrace. Photographed by Author (2013).

Figure 37b: View from south eastern terrace. Photographed by Author (2013).

Figure 37c: View from the Rosema & Klaver Brickworks quarry site of the Voortrekker Monument. Photographed by Ingmar Buchner (2013).

## 2.4 ECOLOGICAL ASPECTS

### 2.4.1 Geological analysis:

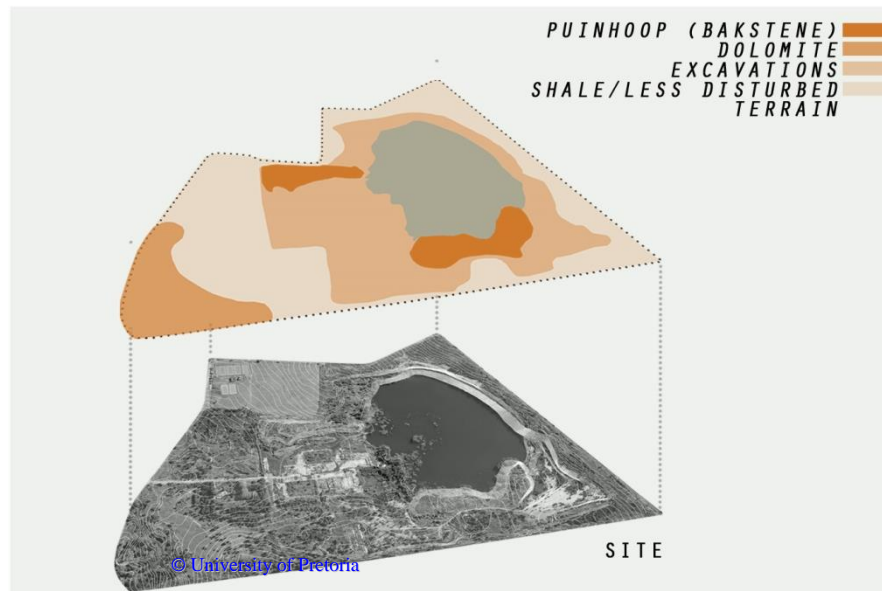
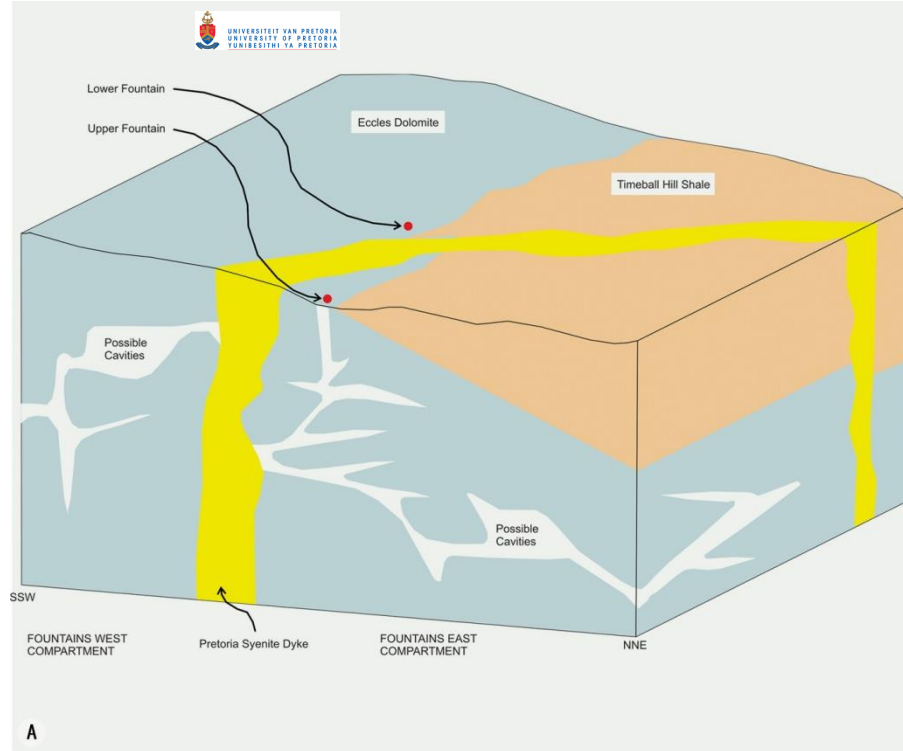
Geological information, provided by Seaton Thomson and Associates (2003), was consulted in order to identify the specific conditions on site. The site consists of shale with the exception of the south western corner of the site, which consists out of dolomite (Seaton Thomson and Associates 2003:22). No development of this corner of the site is therefore recommended (Marneveck 2000:13). Two main 'puinhoep', heaps of soil and bricks, are located to the north and south of the water body. These 'puinhoep' were formed during excavation of the shale, through unwanted and waste material from the quarrying process, and are currently vegetated with mostly exotic plant species.

The area that has been quarried is currently filled with fresh water. When interviewed on 23 April 2013, Mr. Matthys Dippenaar, a hydrogeologist at the University of Pretoria, confirmed that the water level is constant and will not fluctuate except when surface runoff flows into it. This occurred due to the quarrying process, where groundwater from the lower dolomite layer filled the opening formed within the shale layer located on top of the dolomite (see illustration provided by Matthys Dippenaar).

Figure 38: Existing geology on site (Author, 2013).

Figure 38a: Groundwater situated in dolomite layer (Blue) with shale layer located on top of it (Orange) (Dippenaar, 2013).

Figure 38b,c,d: Various areas across the site indicating shale soil conditions. Photographed by Author (2013).





A



B



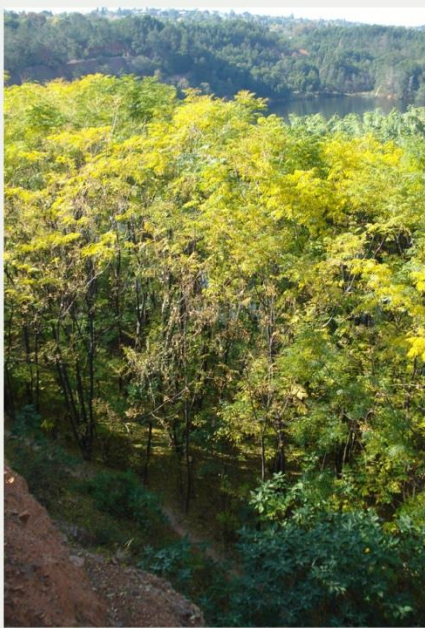
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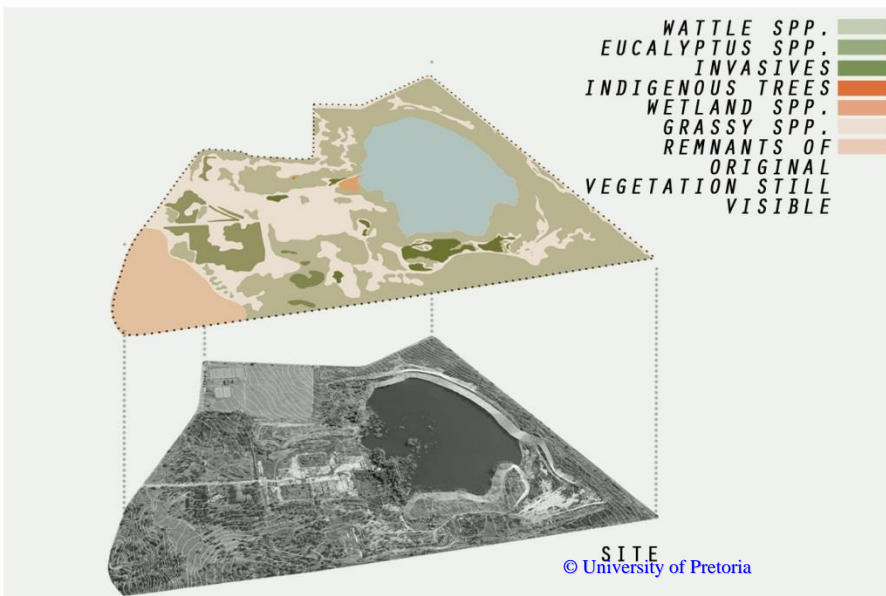
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E



F



## 2.4.2 Vegetation analysis:

Due to the destructive nature of the quarrying process, the site has undergone extreme damage. Over the past few years, nature started to take over and re-established on site. Unfortunately, the majority of the vegetation on site is invasive alien species, of which the dominant species are the *Acacia mearnsii* (Black Wattle).

Current invasive species on site were identified and listed (in Appendix A) in the ecological survey done by Wetland Consulting Services (Marneweck 2000:7). The author identified the original vegetation of the site, which may have occurred before the quarrying started. Mr. Jason Sampson, curator at the Manie van der Schijff Botanical Garden at the University of Pretoria, was interviewed on 30 July 2013 by the author in order to determine the possible original vegetation types of the site. Due to the site's geological characteristics, consisting of shale and dolomite, the site's vegetation will differ on areas of a specific soil type. It has been identified that the vegetation type of the area consisting of shale is SVcb 10 Gauteng Shale Mountain Bushveld (Mucina & Rutherford 2006:466-467) (in Appendix B), whereas the area with dolomite has been identified as the vegetation type known as Gh 15 Carletonville Dolomite Grassland (Mucina & Rutherford 2006:388) (in Appendix C). These specific veld types will therefore act as precedents for plant communities that would be the most appropriate to use for re-establishing on site (further discussed in Chapter 7). Establishing the veld type, will provide a greater biodiversity and support a greater variety of not only bird but also insect and animal species in the future.

Figure 39: Vegetation types and specific exotic plant species located on site (Author, 2013).

Figure 39a-7: Various invasive plant species identified on site. Photographed by Author (2013).

### 2.4.3 Hydrology analysis:

As excavation of the clay on site was stopped, the excavated area started to fill up with groundwater from the underlying dolomite layer as explained in the Geological Analysis. Currently the water depth of the north western corner of the water body is 16 metres deep, which is the deepest point in the water body.

The overall drainage on site occurs towards the western edge (Skilpad Road) due to the site's current overall slope. During storms, rain falling on the eastern edge of the site flows down the terraces and into the water body. Due to the dense coverage of *Acacia mearnsii* (Black Wattle) and their effect on any other ground coverage, the Black Wattles are almost the only species keeping the soil intact. With no grass or shrub species to cover the greater extent of soil surfaces, a lot of the fertile topsoil has already washed away. Thus, during rainstorms a lot of debris flows into the water body. In the central part of the site, most drainage occurs in a western direction and then towards a north western direction where storm water enters the local storm water channels on street level in Skilpad Road and drains towards the Apies River, located west of the site and neighbourhood, and east of the R21 highway. When the water body overflows during rainstorms, the overflow flows along the central 'puinhoop' in a western direction and enters the storm water channel at street level as described above.

On the site's south western corner (with mostly indigenous species and dolomite soil character) a change in slope direction occurs and thus drainage follows a south western direction. This

area's storm water enters the Apies River along the R21 highway.

Various opportunities do exist on site to capture storm water runoff in order to create detention ponds to ensure keeping as much storm water on site, to increase infiltration, and to create wetland scenarios which promote a variety of habitats for plant, insect, bird and animal life.

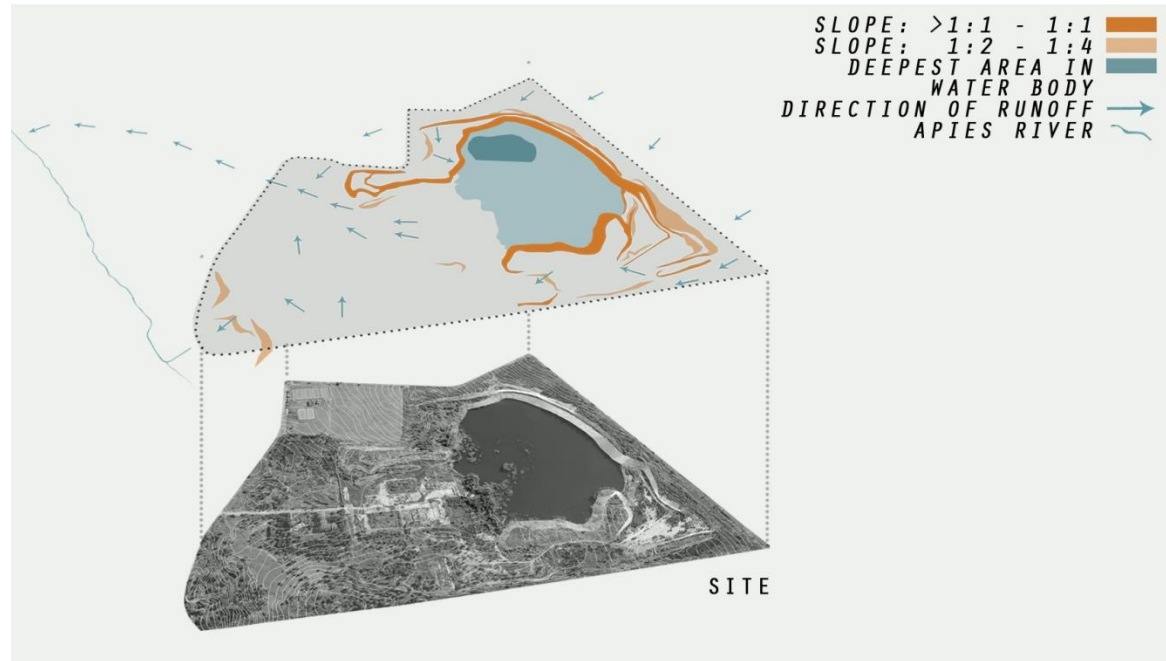


Figure 40: Direction of drainage on site and possible storm water management strategy above (Author, 2013).

#### 2.4.4 Micro climates:

During 1993, the quarrying of clay (shale) was stopped by the Rosema & Klaver Company (Rosema Era Archives, 2013). Buildings were demolished and the piece of land was abandoned. No rehabilitation of any sort took place. Due to the immense excavations that took place over time and the method of excavations various terraces with different orientations were created. These terraces - together with the two 'puinhope' located on the north western and southern edge of the water body or excavated hole - create a variety of slopes and gradients. Due to these micro climates created by north and south facing slopes and changes in gradient, different plant species will flourish on specific locations ideal for their unique requirements or adaptability.

With this realisation, it will be important to incorporate these site conditions with specific plant choices during the process of re-establishing specific plant communities.

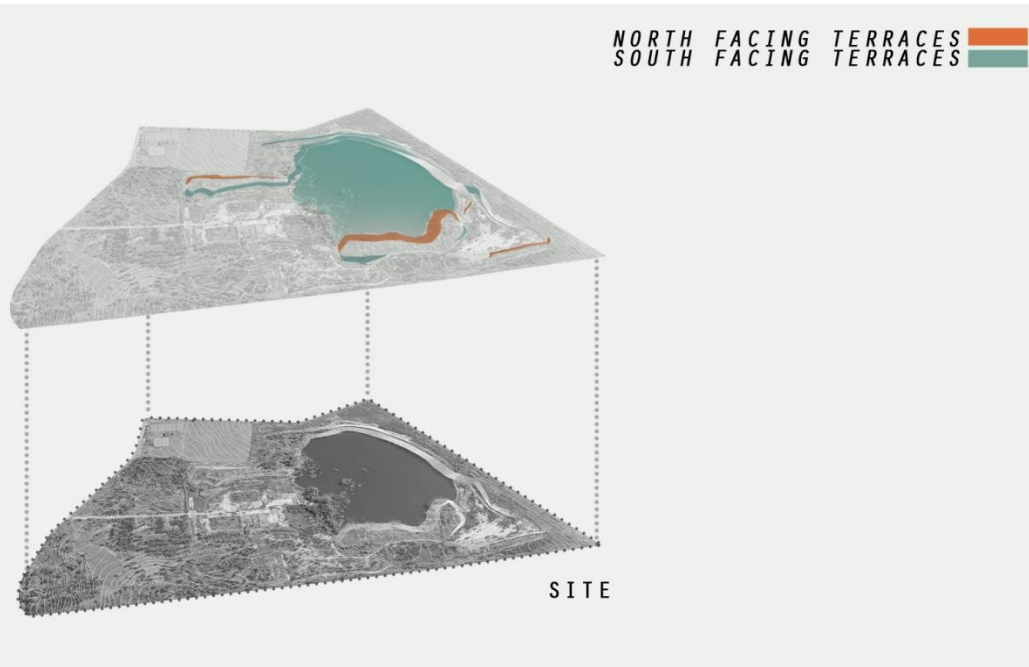


Figure 41: Indication of warm and cold slopes on site creating different microclimates (Author, 2013).

## 2.5 MAIN ISSUES IDENTIFIED AND POSSIBLE OBJECTIVES

### 2.5.2 Main Issues Identified:

#### Encroachment:

A current strategy is proposed for the site to be redeveloped into a residential estate. Within this strategy the potential to incorporate or protect the historical narrative is not taken into consideration. If this proposal is implemented the homogenous nature of the suburb (low-density housing) will spill over and cover the entire site.

#### Centralisation of power & industry:

Current industries within the city are mostly owned by singular organisations, and the models of these industries are focused on singular resources and processes. These industries are expected to provide for the entire local society, resulting in the scale of extraction of resources and overall production to be immense.

#### No acknowledgement of industrial heritage & consequences:

Development schemes for the terrain and its surrounding neighbourhood do not recognise the previous activities on the site or how these activities contributed to our current culture and consumption. We live in a different time and therefore require different approaches and solutions.

#### Conditions not optimal for bio-diversity:

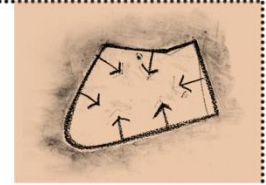
Due to the current soil conditions on site (clay), only a certain amount of species grow on the site. Also, due to the exotic plants species (*Acacia mearnsii*) planted by the previous owners, the

majority of the site has been taken over by this species. These occurrences have an effect on the biodiversity of flora on the site which has an effect on the diversity of fauna as well. The diversity in use and activity is therefore not enabled by the current state of the terrain.

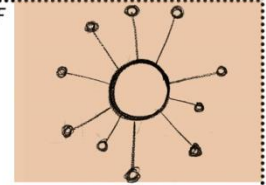
#### Alienation of community & terrain:

The surrounding community is currently turning its back on the site. Visibility into the site is limited and the residents of Monument Park see the site as a risk due to it providing shelter for presumable criminals in the area. Also, the ownership is still in dispute, and constructive action is therefore prohibited. These issues result in the site being disconnected from its surroundings and community, both physically and mentally.

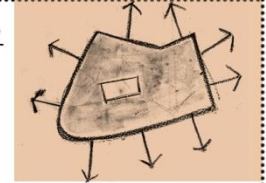
#### #1 ENCROACHMENT



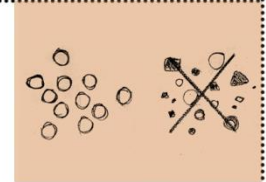
#### #2 CENTRALISATION OF POWER & INDUSTRY



#### #3 NO ACKNOWLEDGEMENT OF INDUSTRIAL HERITAGE & CONSEQUENCES



#### #4 CONDITIONS NOT OPTIMAL FOR BIO-DIVERSITY



#### #5 ALIENATION OF COMMUNITY & TERRAIN

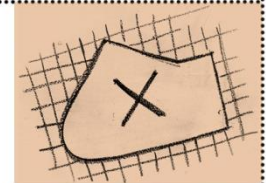
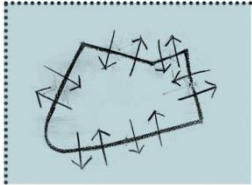
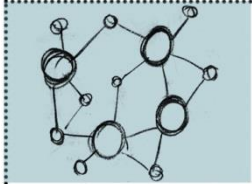


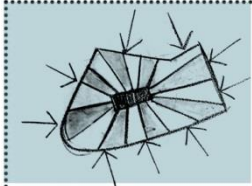
Figure 42: Diagrams indicating main issues identified, as well as possible objectives or vision countering the main issues (Groupwork, 2013).



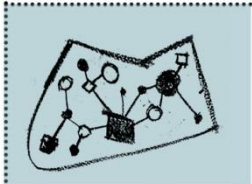
#1 ESTABLISHMENT OF AMENITY RICH IN USE



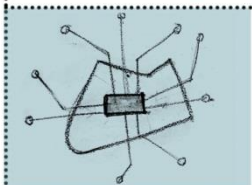
#2 DE-CENTRALISATION OF INDUSTRY



#3 ACKNOWLEDGEMENT/CELEBRATION OF INDUSTRIAL HERITAGE



#4 INTRODUCE NEW INDUSTRY CONNECTED TO LIVING SYSTEMS



#5 INTERVENTIONS ENABLE INTEGRATED RELATIONSHIPS

### 2.5.3 Objectives for Rosema & Klaver Brickworks Quarry and neighbourhood:

#### Establishment of amenity rich in use:

The aim is that new interventions will establish the site as an amenity for the local community, by providing needed facilities and goods. The new interventions will also aim to create a place that is specific to its history and context, with a primary function as a place for recreation.

#### De-centralisation of industry:

The proposed programmes on site will aim to make use, within respected limits, of the available resources on site, while putting back more than taking out. These interventions will take place on a small-scale production model, while the decentralisation of power will also be addressed, as a variety of businesses in the area will be invited to contribute to the function of the programs. Inputs from the local community will also be established. The proposal will aim to integrate these collective programmes (which form part of a component) into a larger urban network of similar developments.

#### Acknowledgment/Celebration of industrial heritage:

The new schemes are expected to integrate the site history and existing ruins into the design of the new buildings and landscape. An informant for the new processes is the past activities that occurred on the site, which will be reinterpreted into functions that offer a regenerative transformation of the site and the health of the surrounding community.

#### Introduce new industry connected to living systems:

New processes will acknowledge the lack of biodiversity and attempt to establish a richer variety of both fauna and flora. Systems and processes will be based on the enablement and support of these new eco-systems.

#### Interventions enable integrated relationships:

Interventions are envisioned to make use of the inputs from the surrounding community, and in return provide for its possible needs. Micro-processes within the surrounding area can be enabled, supported, and linked by processes on site by means of a concrete and interactive approach. This aim will establish connections with the site and its surrounding community.





003

**SILENT INDUSTRY**  
Framework Proposal



Figure 43: View of ruins. Photographed by Ingmar Buchner (2013).

### 3.1 INTRODUCTION

The framework (designed as a shared proposal by the author and the three architecture students named in Chapter 2) will aim to provide a context within which each student can respond to current and proposed conditions, in order to generate an appropriate design for the site. A vision for the framework will be provided in order to form a general concept for the four students to adhere to, and to generate guidelines for individual designs. Current proposed frameworks for the site and its surrounding context were questioned, from which a new proposed Monument Park Framework will be provided as a result of consulting the mentioned objectives in Chapter 2 (Section 2.5). For the purpose of this dissertation, only a brief description of the framework proposal, in response to the analysis explained in Chapter 2, will be given. A more detailed explanation is provided in the accompanied booklet, *Silent Industry: Productive Park as Alternative Typology*. The main objectives have been divided into three categories, namely, urban, industry and heritage, and ecology.



Figure 44: Response to RSDF (Van der Merwe, 2013).

## 3.2 RESPONSE

### 3.2.1 Urban:

Most of the zoning for the routes as proposed will be accepted, except for that of Skilpad Road. This will be rezoned as an 'activity spine', using the description given in the document (RSDF 2013: 54). This route is extended southward to link with the other commercial node, and looped to ensure efficient traffic flow.

Together with this, as an extension of the same strategy, the parts zoned as office-use in the RSDF will be rezoned to mixed-use, with a density of 6-8 storeys. The proposed highway off-ramp will be removed.

The description of 'suburban densification zone' is one that the framework group accepts. The 'linear zones', however, have been relocated to more relevant parts of the fabric, that being along the length of the newly proposed 'activity spine', and other places where the character of the route requires a higher density. Specificity to the linear zones, a density will be proposed of four storeys, as influx of residents and businesses in the area will need to be accommodated. An additional residential density is added to ensure that important views (the one from the site to the Voortrekker Monument particularly) are not obstructed.

The open land running along the river will be demarcated as Ecological/ Recreational Support Artery, which links the old quarry site to the Groenkloof Conservation area. The site itself consequently becomes an Ecological/ Recreational Organ.

### 3.2.2 Industry & heritage:

Within the proposed framework both the history of industry and the current opportunities for ecology are found to have importance in terms of heritage. The Intention is to remedy the whole disturbed ecology, which exist as a result of Industry. The conditions are currently not optimal for biodiversity thus the intention is to recreate a sustainable collection of natural and urban ecosystems within the operative landscape.

Furthermore, an aim is to de-centralise colonies of industry throughout the city in order to rescript the current model centralised industries, to include eco-systemic thinking and principles.

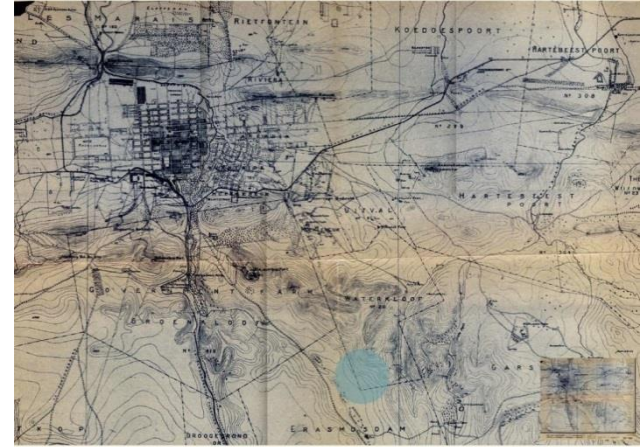
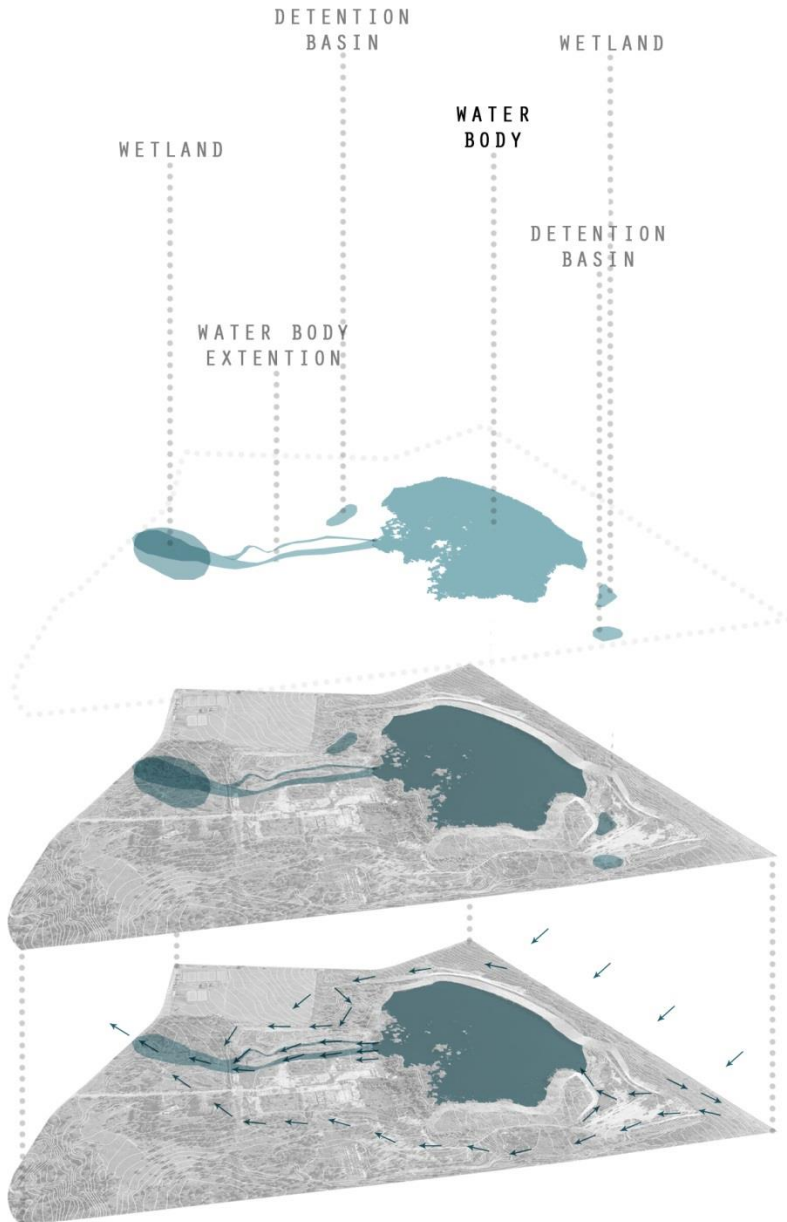


Figure 45: The proposal of de-centralised colonies of industries throughout the city (Van Graan, 2013).



### 3.2.3 Ecology:

The main aim in terms of ecology is to increase biodiversity. This aim will be achieved mainly through the re-establishment of specified indigenous and site specific vegetation types, and additional maintenance on site. The maintenance will primarily include the systemic eradication of invasive plant species. Furthermore, rain water runoff on site will be directed to be stored temporarily in detention ponds of which the overflow will flow into a wetland, situated on the western edge of the site. These detention ponds will decrease the amount of water entering the existing storm water system on road level and increase ground water recharge. Detention ponds or wetland areas will aid in increasing biodiversity due to the increase in habitat it provides.

Figure 46: Proposed storm water strategy (Author, 2013).



### 3.3 Final Framework Proposal:



Figure 47: Final Framework Proposal, in plan (Author, 2013).

3.4 Location of individual design areas:

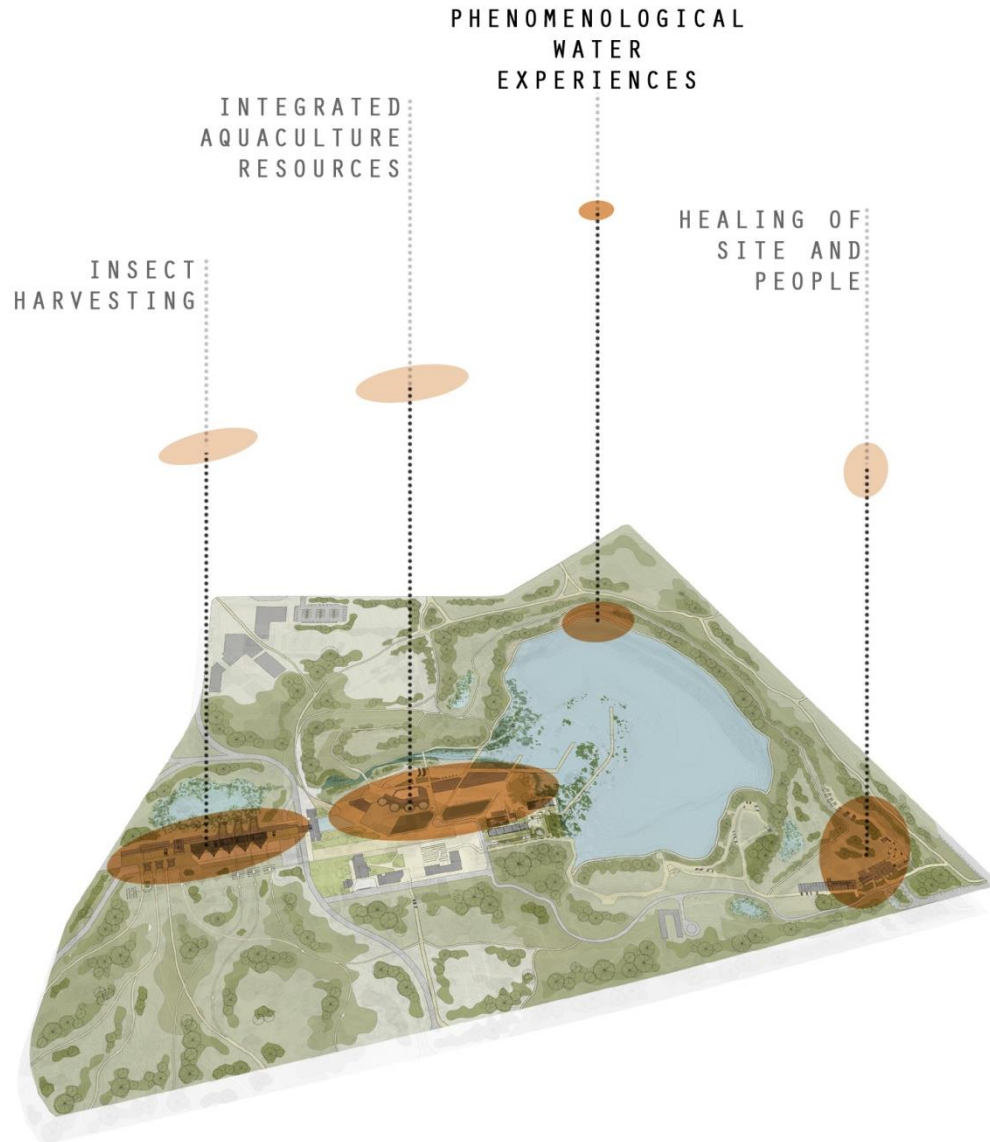


Figure 48: Location of individual design areas (Author, 2013).





## PART 2

Questioning operative landscapes as the  
new aesthetic

004

PROCESS VERSUS PICTURE  
Theoretical Investigation

Figure 49: Ruins between the tall grasses.  
Photographed by Author (2013).



## 4.1 INTRODUCTION

Bryan Obara (2013:10) states that landscapes are currently developed through large-scale engineered systems aiming to complement natural systems. This statement is evident in the proposed framework explained in Chapter 3. A system-focused framework has been developed where industry and ecology function side-by-side to provide a sustainable landscape for the surrounding community of Monument Park, with the possibility to have a regional influence as well. Here, a neglected post-industrial landscape will be re-programmed to provide visitors with a recreational experience of a different kind. Sustainable industries will be accessible to the community to interact with, understand, and learn of processes and interchanges that occur on site, not only between the three proposed industries, but also between industry and ecology, or rather architecture and landscape. With the proposal to re-establish indigenous vegetation on site, as well as walkways and bicycle routes, visitors have the opportunity to explore the site and are made aware of the continuing changes in the landscape from exotic to indigenous vegetation. In such a way, the processes in architecture and landscape, and the interchanges between the two, become the recreational aspect to the visitor. People's interest in and curiosity to learn about the systems creates an activity of leisure and education. The framework resembles an operative landscape, as described by Obara (2013:1,3) in Chapter 1: one designed to be process- and system-focused from the start with no initial thought to aesthetic quality.

Arguments exist that a current focus around environment and its ecological processes within

landscape has become significant, instead of the Romantic era aesthetic thought centred on a so-called plastic beauty, an era when awe and a picturesque sense of nature thrived (Espanol-Echaniz 2010:44,50):

*“The enjoyment of plastic features of landscape should never ignore the reality of culture patterns and biodiversity which lie underneath our impressive aesthetic experience. By doing so, the aesthetic experience should direct people to be aware of functions, mechanisms and relationships involved and never in the opposite sense. Approaching nature aesthetic should make people sensitive to the degree to which human action has affected the vitality of natural systems. Landscape should not be seen as a faded static picture of reality but as a mirror of ourselves, our acts and responsibilities through perception of human action in our environment.”*

It is therefore argued that ecological processes and systems within landscape, and our awareness and recognition of them, are the new aesthetic experience within our urban environments. People should be aware of their effect on their surrounding landscape and the environment as a whole. When we visit, landscapes systems should remind us to obtain more sustainable and environmentally friendly lifestyles, and this experience should be the new aesthetic. With the current approach to re-use and re-claim, vacant land within the city is suitable for regeneration to decrease urban sprawl through urban densification (as explained in Part 1). Vacant land, in this case post-industrial landscapes, become process-focused designed landscapes when regenerated. With the Rosema & Klaver Brickworks quarry, a similar approach was taken

in the framework proposal. In response to Espanol-Echaniz's statement, one wonders if the mere implementation of systems and mimicking of natural processes is enough to create an aesthetic experience to the daily user of or visitor to a landscape. Is this the reason why Obara (2013:1,3) states that aesthetic landscapes are no longer a requirement and the implementation of operative landscapes should be our only focus? It is questionable what influences spatial characteristics and form in designing these landscapes.

This approach to twenty-first century landscape design makes sense to landscape architects and environmentalists who have a responsibility towards the well-being of the environment in order to provide a more sustainable future for all, but does this mean that past principles of landscape architectural design have been replaced? Will this measure of design through ecological processes and systems truly ensure a rich aesthetic experience to the individual? Does the implementation of ecological processes and systems add spatial quality to a landscape design?

## 4.2 PROBLEM STATEMENT 2

Can a regenerated post-industrial (brown field) site, proposed to be an operative landscape, be designed to have spatial characteristics that create strong landscape experiences?

## 4.3 THESIS STATEMENT 2

By considering how man's experience of landscape has been influenced, and how man relates to landscape, the author will aim to approach design from a phenomenological point of view. The aim will be to investigate whether

the individual can have an aesthetic landscape experience when the systems and processes of an operative landscape are represented through an archetypal approach towards landscape.

#### **4.4 RESEARCH & DESIGN METHODOLOGY**

The design methodology of Part 2 will focus on applying theoretical research to conceptual design development. The author will follow a spatial and experiential (phenomenological) approach, of which the findings will be applied to a master plan, as well as a sketch plan and detail design level.

##### **RESEARCH OBJECTIVES:**

- Determine the current experience of the site.
- Consider, through theoretical research, how man's experience of landscapes has been influenced.
- Consider applying theory to conceptual design development methodology.
- Specify how strong landscape experiences can be created within a process-focussed framework proposal.
- Investigate whether specific conceptual design ideas can be applied on a sketch plan and detailed technical level.



#### 4.5.2 Identified places on site with specific characters:

Following the phenomenological approach towards the current site experience, the author chose to place specific terminology on the experiences that she identified, in order to form a theoretical backdrop to her investigation. Definitions were taken from Meto J. Vroom's book, *Lexicon of Garden and Landscape Architecture*, which describe the identified places within the landscape on an academic level. A total of six definitions were relevant:

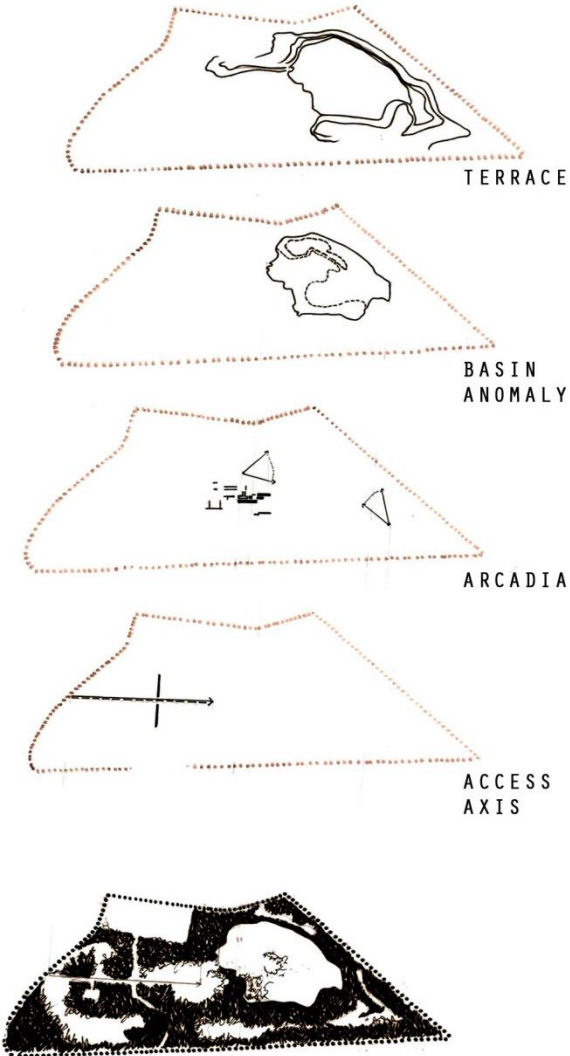


Figure 51: Identified places on site with specific characters (Author, 2103).

- **Axis** (Vroom 2006:61,68):
  - May also relate to: vista or symmetry,
  - a line connecting two points and can also serve as a sightline, when used in the context of towns or parks.
- **Access** (Vroom 2006:20):
  - a way or means of approaching,
  - accessibility (within a geographical sense) implies movement, flow, connection, or arrival at a place or destination.
- **Arcadia** (Vroom 2006:48-49)
  - Relate to pastoral-, poetic-, romantic-, suburban-, or utopian elements
  - Refers to a scene or region of simple pleasure and quiet,
  - "A special form of arcadia became popular in 18th and 19th-century England when picturesque parks and gardens were laid out either amid fertile agrarian land, or in a more natural

setting featuring spectacular geological phenomenon (Vroom 2006:49)."

- **Basin** (Vroom 2006:108):
  - Relate to the terms barrage, source, stream, or sustainable,
  - A partly enclosed or entirely enclosed water area.
- **Anomaly** (Vroom 2006:45-46):
  - Refer to a contrast,
  - A deviation from what is expected or usual,
  - When referring to an anomaly within a landscape it is an 'alien object' which does not fit within its context. This 'alien object' can be experienced as surprising, interesting, or disturbing.
- **Terrace** (Vroom 2006:322):
  - A raised embankment with the top levelled,
  - One of a series of banks or ridges formed in a slope,
  - Introduced by Humphry Repton (1752-1818) as a transitional zone between a house and its garden.

These identified characteristics represent not only form but also atmosphere. Several of these characteristics were prominent elements within the Romantic era (Vroom 2006:49,322). In order to fully understand the current landscape experience determined by the Author's personal response, she found it relevant to investigate the Romantic era since it might clarify why she had a certain response to the landscape.



## 4.6 ROMANTICISM

Due to Medieval tales of gallantry and adventure written in the Roman languages (French, Spanish, Italian, Portuguese, and Romanian), the term *Romantic* was born. Romantic literature shared a lingering nostalgia for the past, similar to the English writers of 'Gothic' poems and novels. Works with milieus and settings indicating the passage of time (damaged sculptures and ruined buildings) conveyed a Romantic aesthetic of "long ago" and "far away" (Adams 2007:721).

Jacques Rousseau (a French philosopher) declared the call of "back to nature" by challenging the idea of so-called civilized life with his concept of the 'noble savage' whose integrity was achieved by banishing society and communing with nature (Adams 2007). This notion of 'back to nature' became a popular escape mechanism for city dwellers that fantasised of an idyllic country life that they could not, or would not, live. Edmund Burke, on the other hand, suggested a powerful aesthetic force, known as the sublime. This concept can be explained as the awesome aspects of nature that exceed the limits of beauty and proposed a territory for the arts to explore. Burke's views on the sublime demonstrated the uncertain character of the Romantic aesthetic. He believed that the passions and the irrational exert a powerful, awesome force on people, which he states explains the subjective reaction to art. His aesthetic system refers to the "irrational" an "attraction to fear, pain, ugliness, loss, hatred, and death (all of which comprise the notion of the sublime) on the one hand, and to beauty, pleasure, joy, and love on the other" (Adams 2007:721,737).

The Romantic Era speaks of a time where people lived under difficult circumstances and longed for escape. They wanted the freedom to make their own choices, to take refuge in peaceful sanctuaries in faraway places, or to be adventurous and see the world. It resembles a time with possibilities and, at the same time, nostalgia.

The European landscape improvement movement was ruled by European theorists and practitioners during the eighteenth century. Factors such as increased industrialisation and urbanisation, improvement in travel, the effects of the Scientific Revolution, and the decrease on religion formed the background to unparalleled change. Aristocratic and bourgeois youths learnt about Italian paintings and classical statuary during visits to Europe on the Grand Tour, so they came in contact with larger, wilder, and more asymmetrical landscapes than they were normally used to. Landscape became an art form, to such an extent that whole expanses of countryside were altered to fit contemporary theories of how landscapes are supposed to look (Porteous 1996:61).

Theorists decided that they could divide landscapes into three general categories: the beautiful, the sublime, and the picturesque (Porteous 1996:61). The 'beautiful' within the landscape resulted from Persian, Greek, and Biblical sources and was comprised mainly out of the tamed agricultural landscape and pastoral, garden, orchard, or arable characteristics. The notion of the sublime reached its peak during the early nineteenth century Romantic Movement,

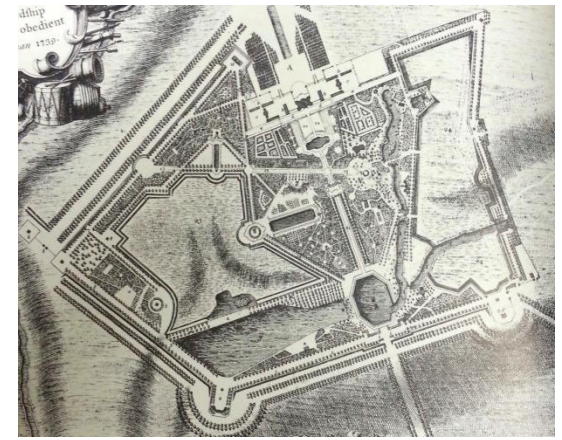


Figure 52a: Plan of Stowe, 1739 (Hunt 1992:78).

Figure 52b: Stowe: the Temple of British Wrthies (Hunt 1992:80).

Figure 52c: Stowe: the Temple of Ancient Virtue (Hunt 1992 :80).



Figure 53: Diagram illustrating comparison between the beautiful, the sublime, and the picturesque (Author 2013).



Figure 54: Claude Lorrain, Landscape with Apollo, the Muses, and River God (Hunt 1992:129).



Figure 55: Francis Vivares, engraving of a waterfall in Bolton Park, Yorkshire, 1753 (Hunt 1992: 131).

mainly in the poetry of Byron and Turner's paintings. Salvator Rosa's paintings dramatised elements such as mountains, waterfalls, deserts, precipices, crags, and rough seas. At first only a minority appreciated the notion of the sublime landscape, but gradually the sublime's somewhat medieval horror and fear made place for awe, and so during the late eighteenth century wilderness and mountains became regarded as aesthetically pleasing. The picturesque is focussed on form rather than function (Porteous 1996:63).

The picturesque could be classified as ranging between the remarkable vastness of the sublime and the exaggerated smooth and gentle tameness of the beautiful. Several criteria were set up by theorists of the picturesque notion in order to judge a landscape or a painting, of which included: 'intricacy', 'roughness', 'abruptness', 'sudden variation', 'surprise', and 'mystery' (Porteous 1998:64).

Many of these criteria (stated above) later became variables of importance in townscape planning, landscape assessment, and psychological experiments in the twentieth century (Porteous 1996:64). Today many of these elements are visible within suburbia, in the form of scenic viewpoints or even calendars, holiday photographs, and picture postcards. In the end, the picturesque movement was outstanding in the development of environmental aesthetics specifically due to its concern with nature in its raw form. For the first time nature was observed as the equivalent of a painting and was admired for that, rather than for its ability to provoke emotions. People were drawn outside their parks and gardens to experience nature and the countryside, and so

exercised the sight, in order for people to form 'the habit of feeling through the eyes' (Porteous 1996:66).

It is clear that the characteristics of the picturesque are similar to the characteristics that the Author identified on site. When Porteous explains that the picturesque can be explained as a combination of the beautiful and the sublime and how people developed a 'habit of feeling through the eyes' (1996:66), it is clear how the view of a landscape, or what is better described as the picture of the landscape, created emotion within the viewers. The form and spatiality of the landscapes influenced the experience of the viewer and, finally, their emotions or thoughts. The specific criteria that the picturesque had to adhere to could be seen as a technique to attract viewers or visitors to particular landscapes. Viewers or visitors all had similar responses to the designed landscapes due to their collective milieu.

Porteous states above that these principles (or criterion) have been applied in landscape design and even city planning for decades to follow, resulting in the fact that our surrounding outdoor environments may still reflect traces of this theoretical notion.

## 4.6 LANDSCAPES AS PICTURE VERSUS IMAGE



Figure 56: *Landskip* (Dee 2001:10).



Figure 57: *Landschaft* (Dee 2001:16).

James Corner argues against the notion where the Picturesque still has an influence on today's landscape designs and aesthetic. He states that due to the fact that landscape is shaped through picture, contemporary landscape architects reason that the visual and formal alone should be considered a priority (Corner 1999a:153). These ideas pose limitations on the full eidetic scope of landscape creativity. Corner's definition of the word 'eidetic', within this context, can be explained as "a mental conception that may be picturable but may equally be acoustic, tactile, cognitive, or intuitive" (Corner 1999a:158).

The author understands 'eidetic' as something that is thought about (mental conception), therefore it is cognitive, and can be translated into real life or communicated as a picture (*picturable*), a piece of music or a sound (*acoustic*), a physical element (*tactile*), or something perceptible (*cognitive*) or from one's own opinion or emotions (*intuitive*).

Corner (1999a:153) states that "landscape and image are inseparable" and "without image there is no such thing as landscape, only unmediated environment". This distinction between the two words (landscape and image) originates from the Old English term *landskip*, meaning "landscape as contrivance, primarily visual and sometimes also iconic or significant" (Corner 1999: 158), as well as an Old German term *landschaft* that doesn't refer to the scenery but rather to the "environment of a working community, a setting comprising dwellings, pastures, meadows, and fields" and also

"the inhabitants of the place and their obligations to one another and to the land" (Corner 1999: 154). This means that the term, *landschaft* is related to the German *gemeinschaft*, meaning community. The scenery of *landschaft* therefore may be seen as picturable but the term's deeper, existential characteristics circle more socially cognitive, *eidetic* processes (Corner 1999a:154).

*Landskip* = primarily visual  
= landscape  
= picture

*Landschaft* = working community within a landscape setting  
= image  
= eidetic

W.J.T. Mitchell describes the differences between picture and image in order to clarify what Corner means with *eidetic* image. This description will be explained through the following diagram also indicating the different types of images (Corner 1999:160-161):

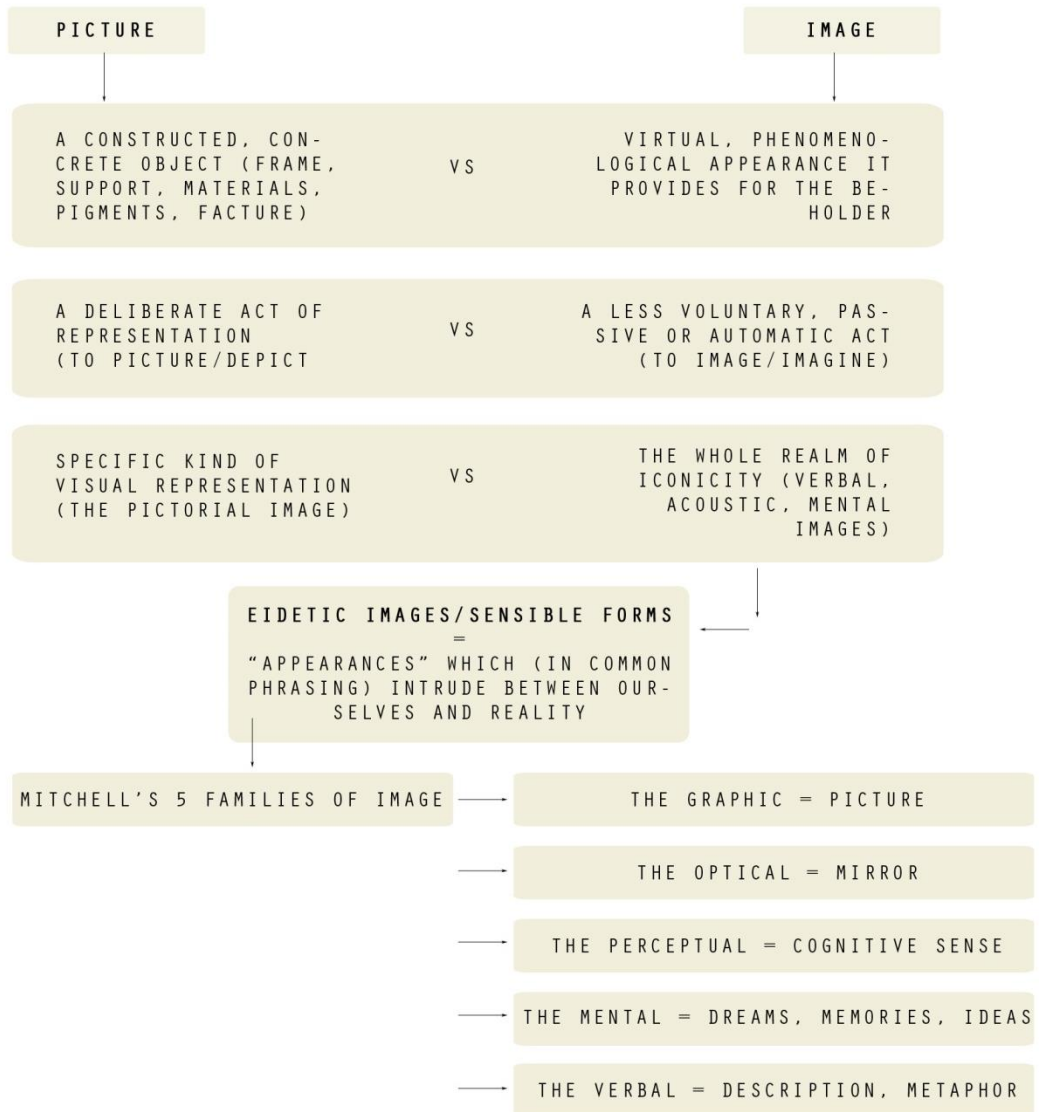


Figure 58: W.J.T Mitchell's distinction between picture & image (Corner 1999a:160-161). Diagram by Author (2013).

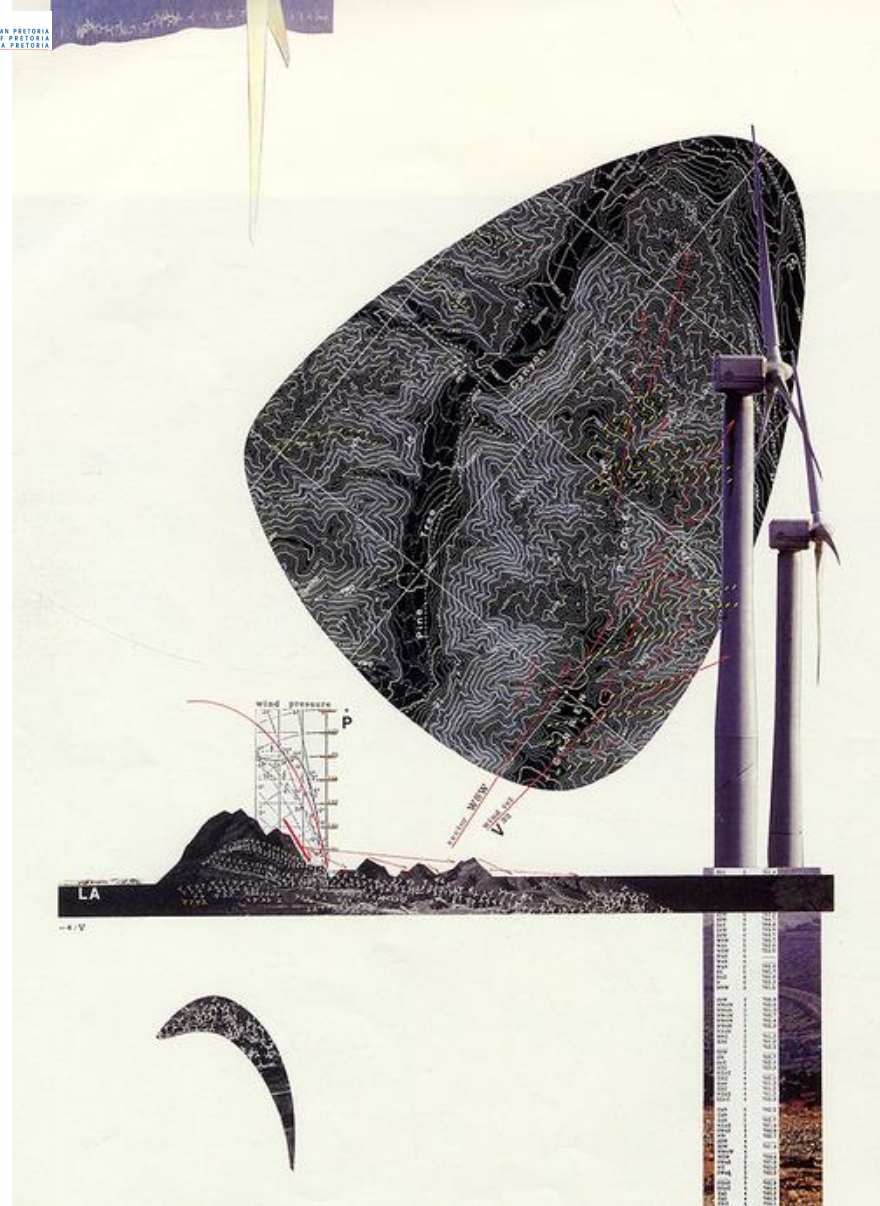
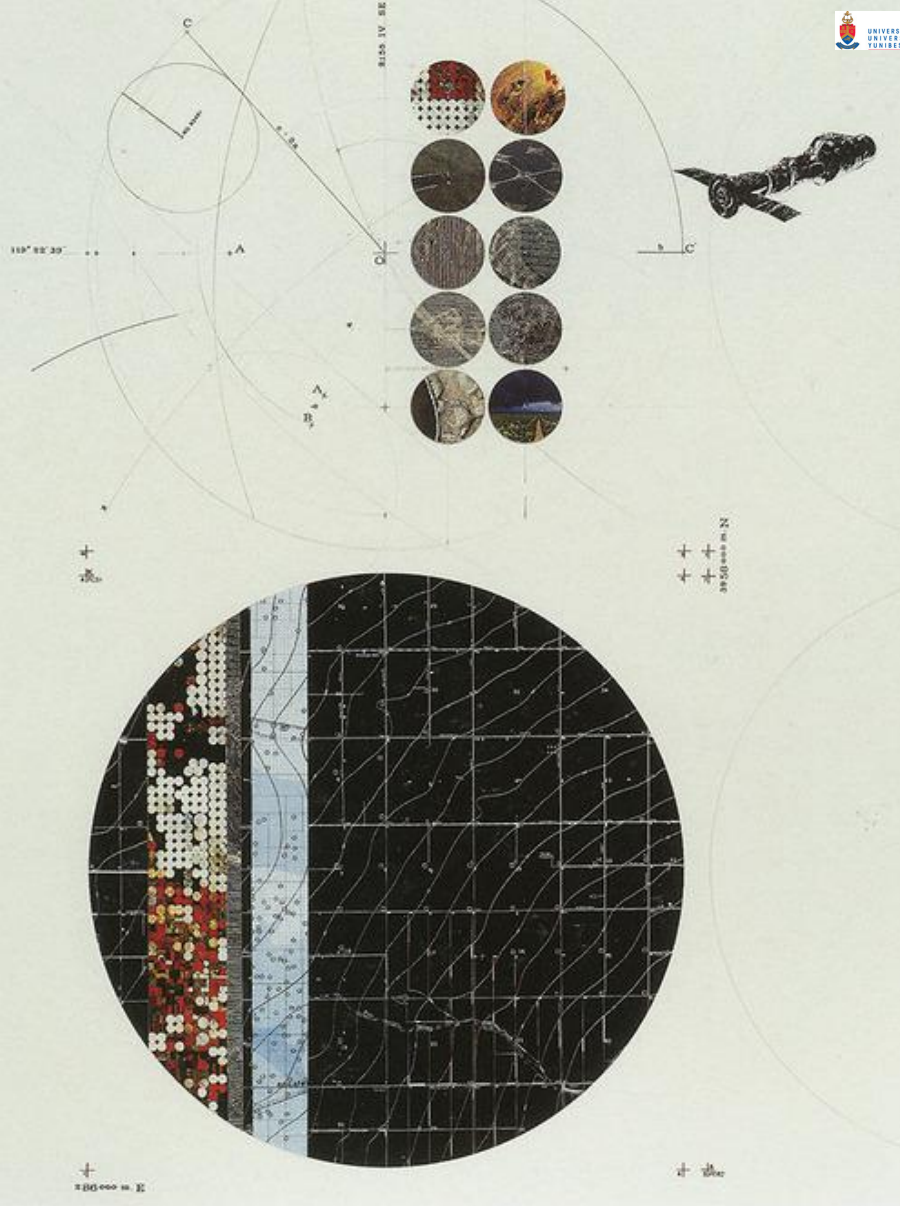


Figure 59a & 59b: Eidetic Operations (Comer 1999:248).

People should experience landscape through habit or use, according to Corner (1999:156), and no longer through vision or contemplation alone, and so their eidetic image of place should be a notion of significance. Corner's critique of the notion of the picturesque is that landscape is being viewed as an object and the action of separating the subject from its complex realities of participating in the world are overlooked. The 'scene' [picture] displaces the viewer, keeping them safe and uninvolved, transporting them back in time, and effectively decontextualizing them from the reality. This situation creates amusement and pleasure, causing the public to not find landscape's picturesque beauty as a problem at all. The viewer is allowed to temporarily forget, escape from the present-day, and the result is a personal withdrawal and nostalgia for the presence of the past, both of which are embedded in an aestheticised landscape experience, rather than a productive, useful, or engaging landscape experience (Corner 1999a:156).

James Corner (1999a:159) raises a question: "...given the obvious limits of landscape as representation [as picture]...is it possible to realign the landscape architectural project toward the productive and participatory phenomena of the everyday, working landscape [image]?" This question refers to a suggestion of return neither to an agricultural way of life nor to functionalist practices but rather to stress experiential relationships of input, engagement, and use over time. The emphasis here changes from object appearances to processes of establishment, dynamics of use, and the poetics of becoming (Corner 1999a:159).

Corner therefore also agrees with the notions discussed in Part 1, where our current focus should be towards an operative landscape with a focus on processes rather than a focus on the 'picture' we are trying to create for the user's aestheticised landscape experience. The processes, and relationships of engagement, input and use over time should become evident to the user and develop into the new aesthetic.

An alternative proposal is made by Corner to apply the notion of image in a different direction. Theorists and historians focus on the idea or object, but designers are more interested in the creativity and the doing in order to give form to things never before conceptualised. Corner's proposal therefore is that designers should not be as much concerned with the kinds of images they create but rather with the kinds of imaging activities that should be developed and advanced (Corner 1999a:160).

Imaging in this context is understood as the development of idea and is essential to the conception and practice of landscape. In *landskip*, the making of a picture contributes to and makes what is to be pictured, whereas in *landschaft* the formation of synesthetic, cognitive images forge a shared sense of place and relationship developed through *work* (Corner 1999a:161). *Eidetic operations* therefore refer to the precise idea-forming techniques for imagining and projecting new landscapes. It suggests a need to study, enhance, and create forms of representative technique that might produce more interactive landscapes than the still-life vignettes of many contemporary landscapes. Eidetic images are essential stimuli to creativity and creation, and though they do not

represent the reality of an idea, they can perhaps initiate its possibility (Corner 1999a:162,163).

Corner therefore rejects the notion and application of picturesque principles but proposes that the notion of creating pictures should rather be applied during designers' process of conceptual development and design generation.

#### 4.8 CREATING EIDETIC IMAGES

James Corner's idea of eidetic images or operations (activities) can be achieved through the action of mapping. He explains how mapping should be viewed in a different light and seen as acts that release potentials, differentiate worlds, and enhance experiences. Mapping should be applied as a productive and liberating instrument within the design and planning arts, and, specifically within the context of today's landscape and urbanism, he encourages designers and planners to creatively approach mapping in order to produce greater value in intervening in spatial and social processes. This notion functions as an instrument within design since we live in a world where it is becoming increasingly challenging to both *imagine* and *create* anything outside of the norm (Corner 1999b:213-214).

The act of mapping in design and planning has been seen, throughout the twentieth century, as a quantitative and analytical survey of the existing conditions before a new project was proposed, and so it was and is assumed that the map will objectively identify and emphasize the terms around which a planning project should be developed, evaluated and built. This tendency evolved around the fact that maps are viewed in

terms of what they represent instead of what they can do (Corner 1999b:215-216).

As designers and planners, we tend to associate the creative part of the design process with an 'act' that follows the part where all the relevant maps have been made. This is why Corner proposes that a critical experimentation with new and unconventional forms of mapping is necessary due to it being underdeveloped and significantly inhibited. As Corner, we should be less interested in maps as finished artefacts and rather view mapping as a creative activity (Corner 1999b:216-217).

In order to execute mapping operations (creative mapping activities) one should understand what the scheme consists of:

- *Fields*: referring to continuous surfaces, schematically the analogical equivalent to the actual ground, or the graphic system within which the extracts will later be organised (Corner 1999b:229),
- *Extracts*: elements identified within a given milieu and drawn onto the graphic field (Corner 1999b:230),
- *Plotting*: the connecting or 'drawing out' of new and concealed relationships identified between the different extracts within the field (Corner 1999b:230).

Therefore, a mapping operation or eidetic operation can be characterised as a picture showing how specific elements (*extracts*) have been identified within a map (*field*) as well as how and where there may be possible relationships or connections (*plottings*) between them.



## 4.9 APPLYING EIDETIC OPERATIONS AS ALTERNATIVE MAPPING OF ROSEMA & KLAVER BRICKWORKS QUARRY

### 4.9.1 Intuitive response to Monument Park:

As an experiment prior to conceptual development and design response, the author decided to apply James Corner's proposal of eidetic operations to the proposed site in Monument Park. The author decided to do separate eidetic operations for the sites' past, present, and possible future view.

#### 4.9.1.1 Past eidetic:

The past eidetic operation incorporated the sites original state before any construction or excavation started. It includes various stages throughout the site's development during the past few decades. Focus was placed on the manufacturing process and equipment, the atmosphere that the buildings and materials created, and the people involved.

Figure 60: Past eidetic operations (Author, 2013).



#### 4.9.1.2 Present eidetic:

Elements such as the location of the site within the context of Pretoria, the textures and materials found on site, the understanding of specific sections through the terrain, as well as the current status and activities on site are represented in the present eidetic operations.

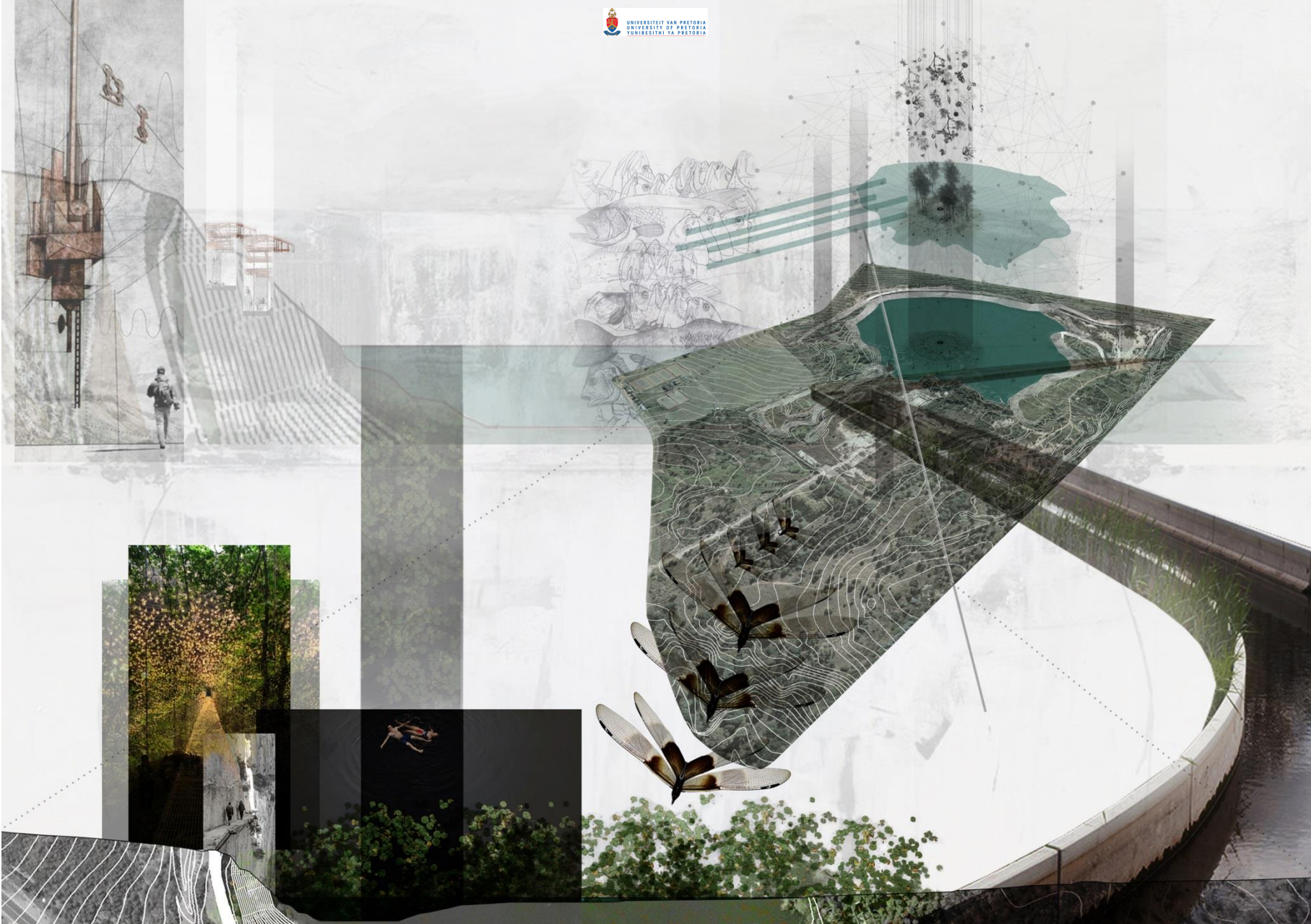
Figure 61: Present eidetic operations (Author, 2013).



#### 4.9.1.3 Future eidetic:

A 'vision' for the site is an appropriate word to explain the future eidetic operation. This representation proposes an atmosphere for the final designed intervention and incorporates elements of new proposed industries, as well as ecological characteristics, for the purpose of creating a unique recreational experience where the sites' *genius* of place is manifested.

Figure 62: Future eidetic operations (Author, 2013).



#### 4.9.2 Thought on applied eidetic operations:

The following assumptions were made from each eidetic image created, and diagrams were provided to translate conclusions to form generation:

- *Past eidetic:*

A prominent notion identified from this image is the prominent role that *movement* played in the process of excavating clay and finally producing bricks, as well as the idea of material that undergoes *change* in structure and form.

- *Present eidetic:*

The role that *ecology* plays on site, currently, becomes evident within this image. Vegetation re-established on a damaged site that still show signs of its past through rich and diverse *textures* and *ruins* throughout the terrain. Iconic *landscape features* (cliffs, a lake, an open field, or woods) within this post-industrial landscape are noticeable due to the past processes that occurred on site.

- *Future eidetic:*

Within this image an impression exist of specific defined spaces that create detailed and exact experiences, rich in textures, fauna and flora and a specific presence of water.

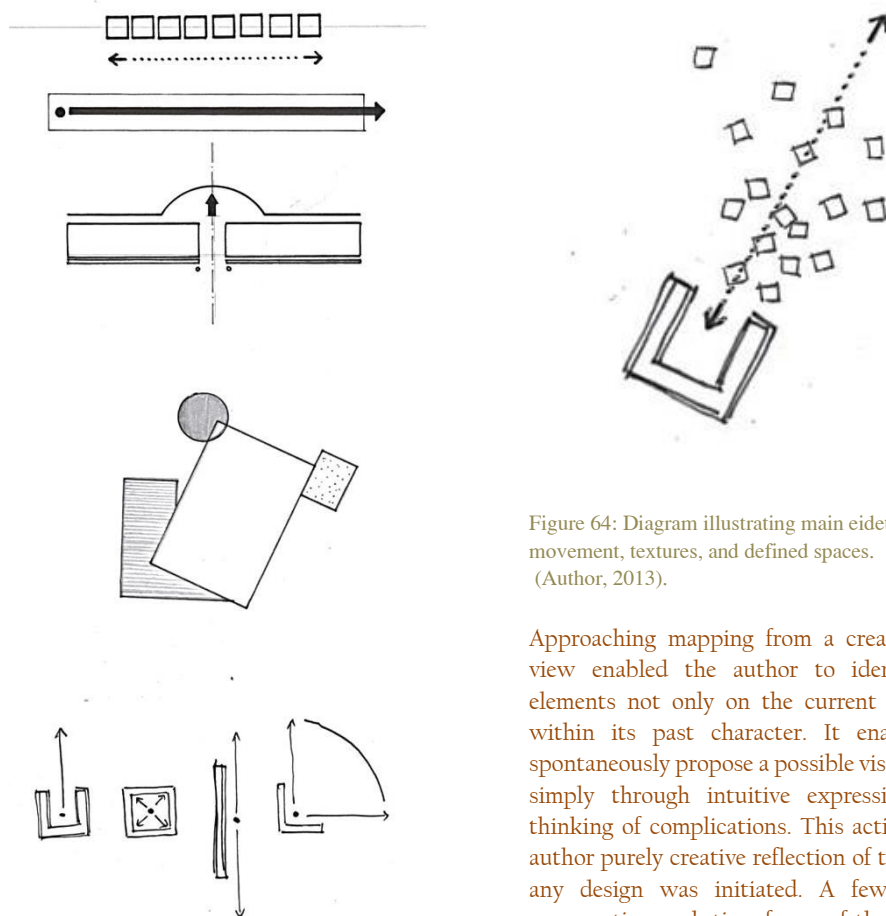


Figure 63: Diagrams illustrating eidetic operations (Author, 2013).

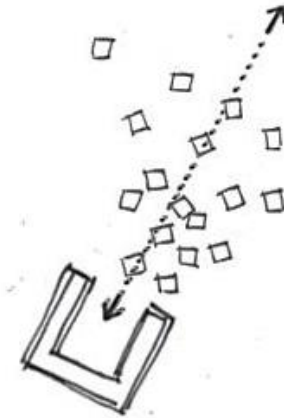


Figure 64: Diagram illustrating main eidetic operations; movement, textures, and defined spaces. (Author, 2013).

Approaching mapping from a creative point of view enabled the author to identify specific elements not only on the current site but also within its past character. It enabled her to spontaneously propose a possible vision of the site simply through intuitive expressions without thinking of complications. This activity gave the author purely creative reflection of the site before any design was initiated. A few main ideas representing each time frame of the site has also come forth: movement/change, textures/ecology, specific space identities and the unmistakable presence of water on site.

#### 4.10 CONCLUDING THOUGHTS ON THEORETICAL RESEARCH AND APPLICATION

With this completed theoretical investigation and practical application of theoretical notions, the author identified that specific characters of the site have been highlighted.

Within the initial thoughts about the first visit to the terrain, it is clear that the author had specific emotional experiences when viewing certain landscape features. Due to dense and wood-like vegetation, she experienced emotions of uncertainty but at the same time curiosity. The discovery of water had a specific effect on her and created a longing to leave the safety of the edge of the land and fully experience the water. Patterns, textures, materials, and ruins created an atmosphere of a presence of the past events that occurred on site.

By identifying specific characters within the landscape it became prominent how these elements reflect the importance of the spatiality and form of the land in relation to the atmosphere or experience that these landscape features create. These characteristics should be conserved and enhanced.

Finally, the eidetic operations identified main ideas that reflect how one can now think of the site in a cognitive (*image* or *eidetic*) manner instead of only focussing on the mere 'picture'.

These elements identified through applied theory, create an encompassing idea of the *genius loci* of the site. *Genius loci* is understood as a place that is a location which conveys a special sense of physical

identity or physical coherence. Physical characteristics influence place but with it so does culture. It is within the interactions between human awareness and suitable physical location that place attains its distinctive meaning (Berleant 2003:43). Isis Brook states why it is important to identify and incorporate *genius loci* when approaching design development (Thompson 2003:68):

1. She recognises the usefulness of talking about *genius loci* if it assists us in defending places that are culturally or ecologically valued against destructive forms of development,
2. As a rhetorical device *genius loci* can have practical value when arguing for sensitive approaches towards planning, design, and construction.

It is therefore important to consult the genius of the place in order to fully understand the "potential natural perfection of a site and to assist its emergence, where necessary, by discreet intervention" (Moore et al. 1993:1).

The above statements clarify that the Old Rosema & Klaver Brickworks quarry truly has specific and important elements and landscape features that cannot be ignored when the design development starts. These characteristics reflect the true current atmosphere on site and can be made more prominent when taken in consideration. With the framework proposal, none of these elements have been incorporated or emphasised. The main focus was to set in place the most successful systems, processes and interchanges for the most sustainable outcome.

The author will therefore approach the design development on master plan scale through the application of picturesque design ideas, a combination between the *Beautiful* and the *Sublime* as stated in 4.6. The main aim of the master plan development will be to assist the emergence of the *genius loci* of the Old Rosema & Klaver Brickworks quarry landscape through discreet intervention (as suggested by Moore 1993:1).





005

EMERGING *GENIUS LOCI*  
Master Plan Design Development

Figure 65: Panoramic view of water body from northern terraces.  
Photographed by Author (2013).



## 5.1 INTRODUCTION

For the emergence of the *genius loci* of the quarried landscape to be possible, the author decided to synthesise the theoretic views discussed in Chapter 4. These notions guided the author to realise the importance of *genius loci* and highlighted the elements that contributed to her initial experience of the site and the impression this experience had on her. These elements will be used as conceptual design informants to apply to the design development of the master plan in order to assist in emphasising the landscape characters, features, or atmospheres so that future visitors or users of this landscape can experience the true *genius* of place.

The main conceptual design informants will consist of:

- The six main landscape characteristics identified by the author:
  - Axis
  - Access
  - Arcadia
  - Basin
  - Anomaly
  - Terrace

These characteristics were identified within the landscape and represent the landscape as a whole as well as individual spatial characteristics found on site. The author will aim to emphasise these characteristics or atmospheres within the spaces. This aim will be achieved by using informants listed below.

- The Picturesque (a combination of the *Beautiful* and the *Sublime*):

A strong idea within this theory revolves around a focus on landscape *form* rather than function. This results in a focus on visual experience. Another factor is the notion of the *sublime*, where this visual experience (the *Beautiful*) creates emotional response. Therefore, the final experience of the landscape should result in the landscape form or features creating *intricacy*, *roughness*, *abruptness*, *sudden variation*, *surprise*, or *mystery*, so that the viewer is in awe.

- Eidetic operations:  
Through the application of this notion the author identified four main elements to highlight during design process:

- Movement/change
- Textures/ecology
- Spatial identity
- Water

These characteristics can be summarised as the following approach: a hierarchy in spatial identities should be created within the landscape through the use of various textures and vegetation in order to create an experience of change as one moves through the landscape towards the water. The water or water body should therefore be the climax - the treasure discovered.

In conclusion, the experience on master plan level should be one where landform (experienced visually) creates a sublime atmosphere as the individual moves through the landscape, experiencing various characterised spaces on the

journey towards discovering the water body and its dramatic edges.

## 5.2 DESIGN INFORMANTS

The three elements summarised above will be used as the informants to the conceptual design approach of the master plan, but will need to be translated to form. For this purpose, Catherine Dee's book, *Form and Fabric in Landscape Architecture*, was consulted due to the fact that she focussed on creating specific landscape experiences through a visual approach towards design, similar to what the author wants to achieve. This approach can be defined as *morphological* (Dee 2001:1). A morphological approach can be divided into two categories known as 'fabric' and 'form'. *Fabric* is the "integrated spatial structure of whole landscapes" (ibis), and refers to the context of the design as well. *Form*, on the other hand, refers to "the components or parts that make up this fabric" (ibis). Furthermore, this morphological approach consists of seven parts: *landscape fabric*, *spaces*, *paths*, *edges*, *foci*, *thresholds*, and *detail*.

These seven parts will be applied during the design development as follows: the seven parts will briefly be explained and then applied to the design of the master plan through planning and spatial definition.

### 5.2.1 LANDSCAPE FABRIC

Landscape fabric can be defined as an overview of the broader landscape and the landscape processes and systems (Dee 2001:3). Three main qualities are desirable within landscape fabric, such as *robustness* (when landscapes support diverse uses simultaneously (Dee 2001:16)),

*mystery* (the quality of an environment to encourage the user to discover more about the place; to engage with it (Dee 2001:17)) and *diversity* (the complexity and richness of elements within a place (ibid)).

#### 5.2.1.1 SPACES:

The part focussing on spaces explores the designing of the enclosure and definition of areas within a landscape for human activities (Dee 2001:3).

#### 5.2.1.2 PATHS:

The section on parts emphasise environments for pedestrians and explores the designing of linear places of movement within a landscape (ibid).

#### 5.2.1.3 EDGES:

Edges focus on exploring linear places of transition, where one space, or landscape part, becomes another. Edges have integrative and social functions and are thus considered as primary structural components within a landscape (ibid).

#### 5.2.1.4 FOCI:

'Foci' refer to a visual distinction and are the contrasting, differentiated or isolated places or forms within a landscape, and may possess social, cultural, practical or orientation functions (ibid).

#### 5.2.1.5 THRESHOLDS:

Thresholds have similar to edges, transitional and integrative functions, but differ from edges due to its 'focused' rather than linear spatial form. They are distinct small spaces or forms in the landscape (ibid).

#### 5.2.1.6 DETAIL:

This element focuses on the 'close-up', the 'tactile', or 'immediate scale' of landscapes. The sensory potential of vegetation, structures, rock, earth, and water are focused on as design elements on this intimate scale (ibid).

### 5.3 PLANNING AND SPATIAL DESIGN DEVELOPMENT OF THE MASTER PLAN:

The master plan has been developed with the consideration of the three main conceptual influences discussed in 5.1, as well as the various parts provided by Catherine Dee (5.2). The Landscape fabric will therefore be formed by means of designing spaces, paths, edges, foci, thresholds, and finally detail. These parts will aim to be robust, diverse, and mysterious to create a sustainable design focussing on creating a subliminal landscape experience.



Figure 66: Initial intuitive master plan design (Author, 2013).

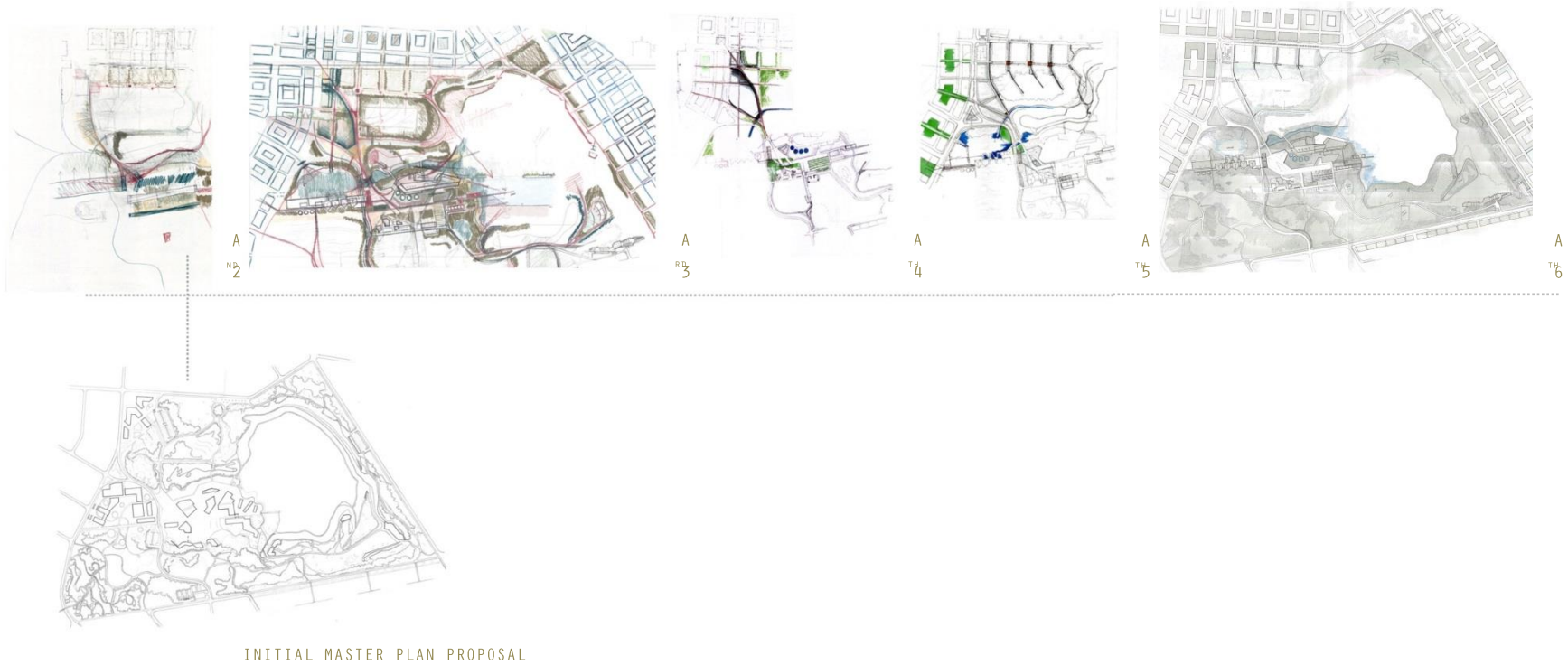


Figure 67: Drawing illustrating author's design development of master plan (Author, 2013).

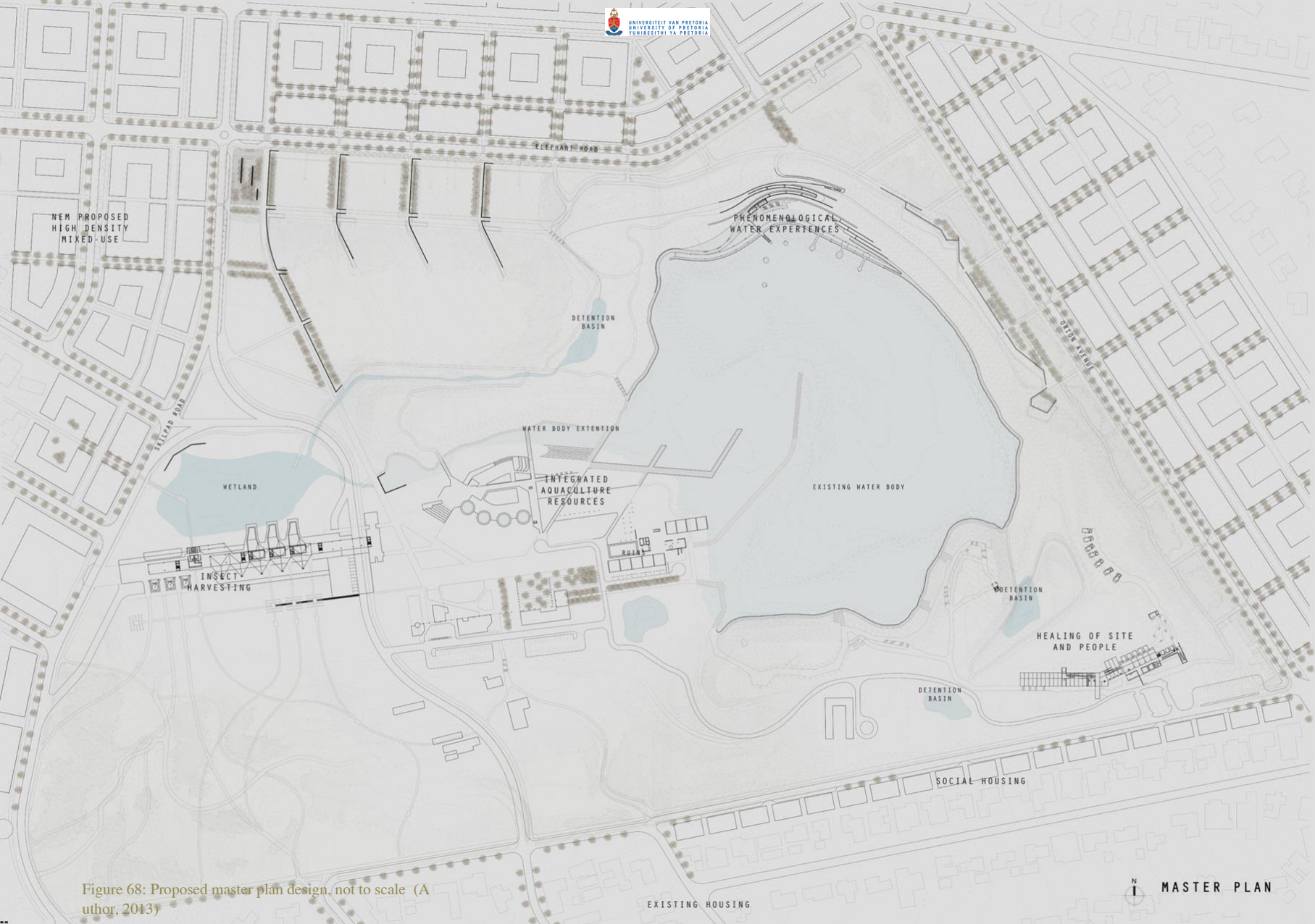


Figure 68: Proposed master plan design, not to scale (Author, 2013)



### Conclusion:

The final master plan has been developed to enhance the experience of the true *genius loci* of the site in collaboration with the applied systems developed in the framework, as well as the incorporation of the industrial heritage of the site through the proposal of new sustainable industries, explained in Chapter 3. The experience will be influenced by the spatial definition throughout the terrain, the change in vegetation over time, and the experience of the new industries. The recreational element of the site will consist of walkways, bicycle trails, informal recreational spaces for picnicking, informal sports, or leisure, canoeing, fishing, and the public accessibility to the industrial processes and systems proposed on site.

Though the *genius loci* of the Old Rosema & Klaver Brickworks quarry has been incorporated in the master plan development, one aspect has not been fully explored. The most prominent feature of this landscape, caused by its historical activities, is the remaining water body and cliffs. The master plan proposes walkways and bicycle trails around and on these features, canoeing, and fishing, but does this type of experience truly influence the user's perspective? Does movement along the cliffs and views over the water body and of the surroundings make a visitor to the park experience the fullness that this landscape and its magnificent landform offer? Does an opportunity exist for the individual to experience these two strong landscape features on another level?

How can the elements of land and water become a strong landscape experience through spatial design with the initial implementation of systems and processes?

The two landscape features, the water body and its surrounding cliffs or edges, will thus be the focus area for the detailed design development.



006

ARCHETYPAL  
LANDSCAPES  
Detail Design Development

Figure 69: View from western edge of water body.  
Photographed by Author (2013).



## 6.1 INTRODUCTION

As explained in the conclusion of Chapter 5, an opportunity exists to investigate whether visitors to, or users of, the park can experience the water body and its surrounding edges through other activities than the norm. Fishing and canoeing have been incorporated in the master plan development, and are activities that occurred on site before any new proposals were developed. This activity and interaction with the landscape forms part of its *genius loci*, people already showed interest in interacting with and an attraction to this special element hidden in the landscape (Chapter 1, section 1.8.4).

The master plan focussed on the experience of a sublime atmosphere as the individual moves through the landscape, experiencing various characterised spaces on the journey towards discovering the water body and its dramatic edges (as aimed in the conclusion of Chapter 4 and expressed in Chapter 5). The approach towards the water is therefore a main concept throughout the landscape design, as well as the arrival at the water body. What awaits one on arrival is the experience of going on the water with a canoe or fishing. Walking or riding a bicycle along the edge of the water body and along the cliffs has also been provided for. The individuals' experience of these two elements or landscape features, still feel limited to the author, and the sublime atmosphere of these features have not fully been enhanced.

An interesting fact is that not only the author felt attracted to this place (specifically the water body and its surrounding edges) in the landscape, but other people have also been attracted to this space, though it may have been unsafe (Section 1.8.4). What caused this attraction is unclear, as is

one's desire to experience this space even more than from the safety of a canoe or along the edge. These experiences, being *along* a vast water body surrounded by steep cliffs or being *within* the space, *on* the water, perceiving the cliffs surrounding you, are of a sublime nature. The sight of the landscape uncomfortably lures a visitor to take the risk of leaving the safety of the edge and going onto the water, or experiencing the high cliffs. The question remains, what aspect is the true attraction?

## 6.2 AESTHETIC SATISFACTION

Water has different dimensions. Though we have the luxury of keeping ourselves safe by staying on the edge along the water or floating in a canoe on the water, and appreciating the view and finding it attractive, one has another dimension of experiencing water and that is to go into it and be submerged by it. As stated in Chapter 3 (Section 4.6), Porteous explains how we, as humans, developed the 'habit of feeling through the eyes' (1996:66). The view of the landscape or the 'picture' creates emotion within us. The form of the landscape influences the experience of the viewer and his or her thoughts and finally actions. This picture of these two landscape features on the site and the combination of the two has this effect on the perceiver.

Appleton (1975:69) explains a proposition he calls habitat theory, where we, as viewers of a landscape, experience aesthetic satisfaction when contemplating a landscape. He states that this aesthetic satisfaction "*stems from the spontaneous perception of landscape features which, in their shapes, colours, spatial arrangements and other visible attributes, act as sign-stimuli indicative of environmental conditions*

*favourable to survival, whether they really are favourable or not*" (ibid). Appleton thus compares the relationship that human observers have to the perceived environment to the relationship of a creature with its habitat (Appleton 1975:69-70). The satisfaction that we derive from the contemplation of the environment (a satisfaction we can call 'aesthetic'), ascends from the spontaneous reaction to the environment as a habitat. This habitat is a place where we have the opportunity for accomplishing our simple biological needs. When we accomplish an adequate control over our environment to render the essential in order to achieve these biological needs, the mechanisms do not instantly die out in the species but will continue to be transferred from one generation to the next, and may, if required, be called upon again to release their primitive function. Mostly, these mechanisms are freed from their function (of ensuring the survival of the individual and the species), and so we are then able to enjoy the satisfaction which results from the perception of a favourable biological environment without the threat of exposing ourselves to any hazards (Appleton 1975:69-70).

Due to the fact that we have somewhat more control over our environments today, because we do not have to survive in similar ways than in primitive times, we can simply enjoy the aesthetic satisfaction that we associate with similar environments to those that once provided for us. It therefore means that certain objects in the human environment are identified by the perceiver and act as sign-stimuli that associate to the stimuli that contributed to our past behaviour. Appleton (1975:172-173) argues that habitat theory highlights the importance of the

continued operation of these stimuli even after they have stopped to be biologically essential.

Therefore, we have a connection with landscapes, and in this case the landscape left by past industrial activities, due to the composition (picture) they form that resembles environments that we associate with safe habitats or spaces. This notion can better be described under the prospect-refuge theory, stating that the "*ability to see without being seen is conducive to the exploitation of environmental conditions favourable to biological survival and is therefore a source of pleasure*" (Appleton 1975:270). What is important is the continuing need for individuals to accept the realisation of inborn mechanisms as a part of their biological make-up, in order to develop these mechanisms through experience into more complex habits so that they may regulate and express their own relationships to that environment (ibid).

The mechanisms referred to are divided into two groups known as 'inborn' (stated above) and 'learned'. 'Inborn' mechanisms are crude, fundamental, and simple, but through learning, practice, and experience they become refined. This emphasises the importance of an individual to make effective use of its favourable environment. Man needs a continued reminder or assurance that he is the master of his environment and at the same time longs for the aesthetical satisfaction he gains from the favourable nature of the environment. Mastery over man's environment, according to Appleton (1975:177), can be found through exploration, the ability to move swiftly from one part to another, and having controlled movement over the body. In a similar

way that seeing without being seen provides satisfaction, the ability to "*run fast, to climb with agility or to take to the water persists as a source of satisfaction when it is no longer needed as a prerequisite for survival*" (Appleton 1975:177-178).

This clearly explains why visitors to the Old Rosema & Klaver Brickworks quarry are attracted to these landscape features due to them providing the opportunity to see without being seen and causing aesthetic satisfaction due to the favourable nature of this specific environment. Simultaneously, visitors to the site need to be assured of their mastery over the environment, which can only be possible through exploration and the freedom of movement as each individual craves. Therefore, a desire may exist to not only be the master of the environment from along the edges of the water or even from being on the water, but also of what lays underneath the surface. The author thus questions how one would design for a scenario where people can have the freedom of exploring the significant landscape features on site and experience aesthetic satisfaction due to the fact that they are released from their inborn mechanisms. Visitors to the site and daily users of the site should be provided the opportunity to develop 'learned' mechanisms due to the exploration of and no restriction to the water and its edges since any possible hazards have been reduced.

The above stated views of Jay Appleton explain clearly why visitors to the Old Rosema & Klaver Brickworks quarry are not only attracted to the view provided by the landform and vast water body, but also desire to explore and experience the place freely. Searles (in Appleton 1975:68)

believes that man is continually seeking to revive his association with his biological background by means of recreational activities and through interests such as gardens, nature haunts, gardening, zoos, pets, and the element of landscape in movies, literature, painting and even dreams. Unfortunately, it seems to him that our culture is consciously ignoring the psychological importance of the nonhuman environment (ibid). When we look back at our ancestors who were forest dwellers since time immemorial, we differ drastically since we can be described as apartment-house dwellers. This notion alone is enough to explain the irresistible desire for nature on the part of citizens, for them to get outside, in open areas, away from enclosed houses and work spaces and into the greenery of the outdoors (Sitte in Appleton 1975:68).

### 6.3 PROVIDING FOR THE DEVELOPMENT OF 'LEARNED' MECHANISMS BY REDUCING HAZARDS

Within the focus area, enjoyable views of the landscape exist from the safety of the edge or in a canoe on the water. But a true sublime characteristic of a water body is its depth. The mystery of what is under the surface of the water is one that makes us uncomfortable but curious at the same time. This notion exists due to the hazard that perceivers do not know what may be underneath the water's surface but in an attempt to find out, the possibility of drowning exists. The author should thus design for users to have the opportunity to master the waterscape environment without the presence of any hazards. People should have the chance to move freely through and across the water, to explore and

experience its various dimensions and effectively promote another level of aesthetic satisfaction.

In order to create the perception of a non-hazardous environment within this waterscape, in such a way that it does not threaten one's survival, the author has to focus on the action of people moving towards the water (therefore their approach) and their way of entering and acting within the water. When spaces are created in a way that people feel that they relate to similar primitive natural environments, they will have the freedom of exploration because their life is not in danger. When their reaction to the designed environment comes naturally they would be able to explore, experience, and move freely within it and be aware of another form of aesthetic satisfaction other than the satisfaction created by only perceiving the landscape from a safe perspective. The question thus remains: what is people's natural, or ordinary, or even universal action in relation to water?

### 6.4 ARCHETYPAL LANDSCAPE ACTIONS

We, as humans, have various ways of interacting with water when it comes to the experience of going into it. The measure of this interaction is caused by the characteristics of the water body. Thus the 'picture' of a landscape containing water will determine the way we interact with it. This belief can be connected to the explanation of archetypes. Archetypes, as explained by Catherine Dee (2001:41), can be understood as "*similar forms or physical arrangements of human environments which have been repeated or copied over long periods of time and continue to perform the same types of actions...[and are] considered to be universal*". When this definition is applied to landscapes, specifically ones containing

water or water bodies, the author understands that it would represent different scenarios of landscapes with aquatic features or water spaces that most people would relate to. Water spaces refer to lakes and waterscapes, pools and ponds, water falls and moving water, and finally moats (or water as an enclosing element) according to Catherine Dee (2001:76-80). The author argues that the actions whereby we as humans interact with these water spaces could also be defined as *archetypal*.

Since the approach towards the water body is such an important concept, the water's edge becomes a very important aspect. The water's edge is both a place of safety for the perceiver and, simultaneously, the threshold that needs to be crossed in order to have the other dimension of aesthetic satisfaction discussed above.

The water's edge is "*the place where land meets water [and] is an important edge that attracts diverse and intense use, which the designer facilitates*" (Dee 2001:139). Beaches, platforms, boardwalks and piers, promenades, wetlands and marginal water places are examples, discussed by Catherine Dee (Dee 2001:140-143), of where the water's edge becomes a water space in a sense. The water's edge takes on the characteristics of a threshold and can be explained as follows (Dee 2001:171):

*"Thresholds are places of transition and, if well designed, places that help to integrate the physical landscape and the experience of it. Thresholds give spatial configuration to people's need to adjust from one situation or experience to another. They are places in which people wait, rest, anticipate, arrive and leave, greet, contemplate, change –*

*they are places in which to acclimatise or prepare. A threshold can often provide visual and physical integration of the landscape if it possesses qualities of both the spaces it connects – the environment that is being left behind as well as the place being entered.”*

Thresholds, in the sense of these two landscape features on the Old Rosema & Klaver terrain, should thus connect with the qualities of both features, namely land and water. The action of an individual crossing this threshold from one ‘quality’ to the other becomes the main focus in the design of these water spaces in relation to the experiencing of land-water-transitions, and vice versa. The range of actions that people can take to complete a transition will inform the design. Universal actions of transitioning from land to water will be taken in consideration in order to relate to a majority of users. The author argues that universal actions could otherwise be referred to as *archetypal* actions. Though archetypes, as stated previously, relate to the physical arrangements of human environments and the fact that they have been copied and repeated numerously, when this description is applied to *actions* it refers, believed by the author, to how these physical arrangements have caused universal reactions within environments. In creating this transition within the landscape, the author will attempt to design spatial arrangements that aim to encourage universal or *archetypal* actions of land-water-transition in order to create environments where survival is not threatened. When people have the freedom to move without restriction and through exploration, they will find the experience aesthetically satisfying. The author argues that when these archetypal actions are related

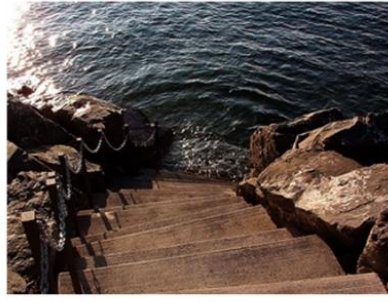
specifically to landscape, in this case related to waterscapes, it can be defined as *archetypal landscape actions*.

## 6.5 INVESTIGATING ARCHETYPAL ACTIONS TO LAND-WATER-TRANSITIONS

Through a visual exploration, the author aimed to determine various types of actions taking place in the transition of land to water as well as actions taking place in water, and the surrounding spaces that could contribute to these actions. Imagery evaluated provided information of:

- The manner in which people move from land to water;
- The various activities taking place in water;
- The structural elements that make transition from land to water possible;
- The various archetypal landscapes in relation to water spaces and land-water-transitions;
- The materials, textures, surfaces, and spatiality influencing land-water-transition and water spaces.





Figures 70a-p: Visual exploration. List of references provided in bibliography.

The visual exploration highlighted various aspects. Specific water spaces, such as natural landscape features (for example lakes, rivers, and the beach), are universally relational. These natural landscape features' edges have specific characteristics, for example, a sandy beach meeting the waves, a pebble or rocky river bed meeting the moving water of a stream. Another interesting sight is that of an island within a lake which represents a destination, something to swim to which needs to be investigated or explored. Man-made or built elements that are relational are structures like a jetty protruding over a water body, stairs stepping down into the water, or bridges crossing the water. Interesting, phenomenological activities are identified, such as, the pleasure of sitting on an area protruding over the water with one's feet hanging in the water, the rush of running across a jetty or off a ledge and plunging into the water. Playing in the shallow water in a stream or where water is cascading becomes a prominent activity, as well as the sensation experienced with a change in textures or depth as one slowly walk into water. These are conclusions made from the author's perspective, of which she will aim to apply as characteristics to incorporate into the design of water spaces. In her aim she will investigate and finally determine whether this approach of applying archetypal landscape actions when designing can result in creating strong landscape experiences within an operative post-industrial landscape.

## 6.6 PROGRAMME

The author will design a space within the Old Rosema & KLaVer Brickworks quarry where the transition between land and water are explored

and experienced. She will focus on giving a visitor to the site or daily user of the site opportunities to explore the edges along the water and the possibility of entering the water to a point where they will be able to swim within an area of relative safety. The water spaces and various relational or archetypal actions identified through the visual exploration will be the main drive behind the design development. A focus on the phenomenological experience that an individual will have throughout the design, from approaching the water up to entering and being in the water will be a main and careful consideration from a design and designer's point of view. In order to approach this design, a brief analysis should be incorporated to determine an appropriate location for this programme along and within the water body.

## 6.7 FOCUS AREA SELECTION

In order to create an area where people or swimmers can enter the water with ease, an area should be considered where the depth beneath the water's surface is relatively shallow and gradually increases in depth with movement away from the water's edge.

Another criterion will be that a strong landscape experience will want to be created and so the contrast between land-water-transition should be as dramatic as possible. It will also be viable that the area where swimming could be possible should be easily accessible in cases of emergency. The swim area should consider other activities within the park since the event of swimming, playing in water, diving, and plunging could in some cases become an audible occasion. Thus this recreational activity should be located in an area

relatively far away from areas where for instance the newly proposed clinics and healing rooms are situated at the medical facility located on the south eastern corner of the site.

As illustrated by the figures and listed criteria above, it is clear that the northern edge of the water body provides an ideal location for the design of this recreational activity. This is also an area separate from other recreational activities proposed in the master plan, such as canoeing and fishing which can be conflicting activities in terms of safety to swimmers. A specific criteria or objectives should know be set out for the recreational activity to become a reality and this criteria should be investigated through an analysis of the focus area.

The northern edge of the water body has been found to apply to the above stated criteria.

## 6.8 SWIMMING AS RECREATIONAL ACTIVITY

Places in which people are allowed to swim, either in built swimming pools or beaches or other more natural locations, specific objectives should be followed in order to create a safe environment for swimming as well as a comfortable environment to ensure an enjoyable experience.

The following criteria are set out as recommended objectives to achieve the above stated aim. These are objectives that the author remembers from her own experiences in such places, and recommendations or general rules provided by the City of Tshwane Metropolitan Municipality (2013):

Author's criteria:

- A safe swim area for children and adults;
- Safe swim areas for children are usually considered as separate areas to ensure a shallow water depth and a clear view over the whole area;
- A beach area or shore where people can relax along the edge of the water;
- A sunny location to ensure higher water temperatures and the possibility for people to bathe in the sun;
- In a sunny location the opportunity for shade should also be considered for people who would rather prefer such an environment;
- Ablution facilities become a priority to provide people with areas to change clothing and use the toilets;
- A point should be specified where a life guard can be appointed to keep an eye on swimmers and bathers for their safety as well as to assist in emergencies;
- Another possibility could be to provide a small tuck shop where visitors can get refreshments during their time on site.

The general rules provided by the City of Tshwane Metropolitan Municipality will be enforced through management that will need to be set in place after the design of the facilities. The criteria set out by the author will be incorporated if possible since the true nature of the terrain is not yet clearly understood.

General rules provided by the City of Tshwane:

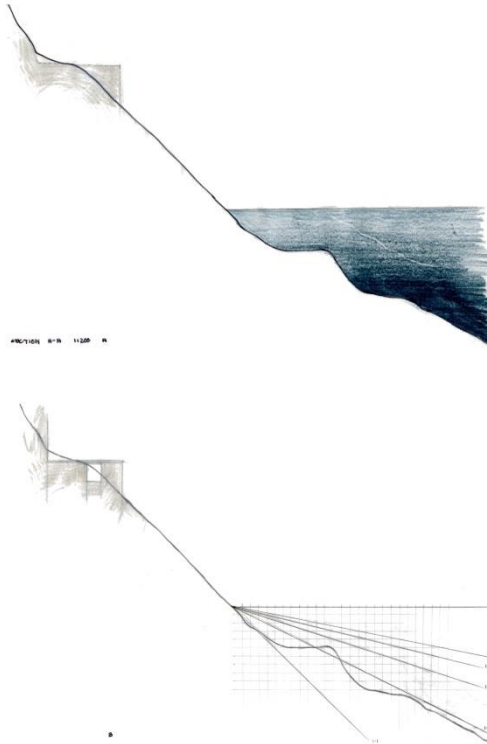
- No alcoholic beverages are allowed at swimming pools;
- No pets or animals are allowed;
- Dangerous games or the throwing around or dangerous objects are prohibited;
- All refuse must be placed in refuse bins;
- Only recognised swimwear are allowed;
- And all facilities are used at own risk;

## 6.9 FOCUS AREA ANALYSIS

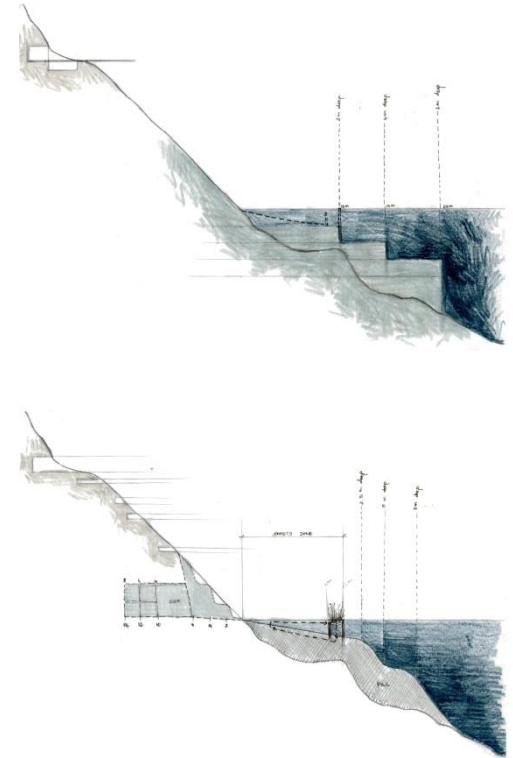
### 6.9.1 Sections indicating land-water connections:



EXPLORING POSSIBLE SPACES AT WATER  
AND TERRACE LEVEL



EXPLORING VARIOUS DEPTHS UNDERNEATH  
WATER LEVEL



CONSIDERING CUT TO FILL TO CREATE SHALLOW AREAS  
UNDERNEATH THE WATER LEVEL, AND CREATING OPEN  
SPACE NEXT TO THE WATER BODY

Figure 71: Land-water connection (Author 2013).

6.9.3 Appropriate focus area location:



SHALLOW AREAS UNDERNEATH WATER LEVEL



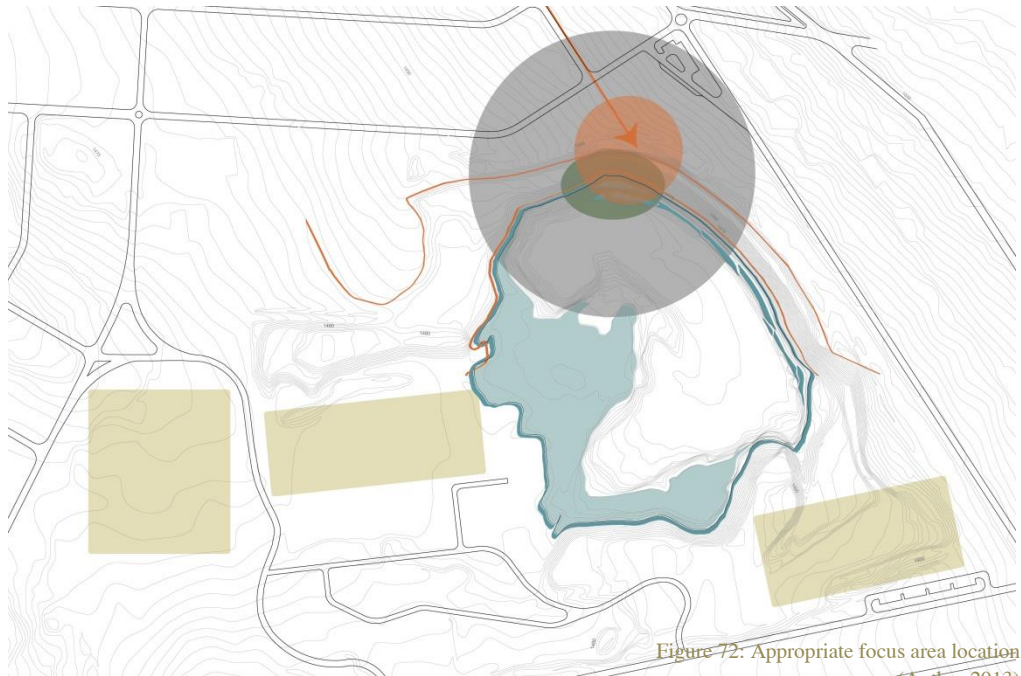
ACCESS FROM ROAD, TERRACES, AND INDUSTRIAL NODE



LOCATION IN PROXIMITY TO OTHER FACILITIES ON SITE



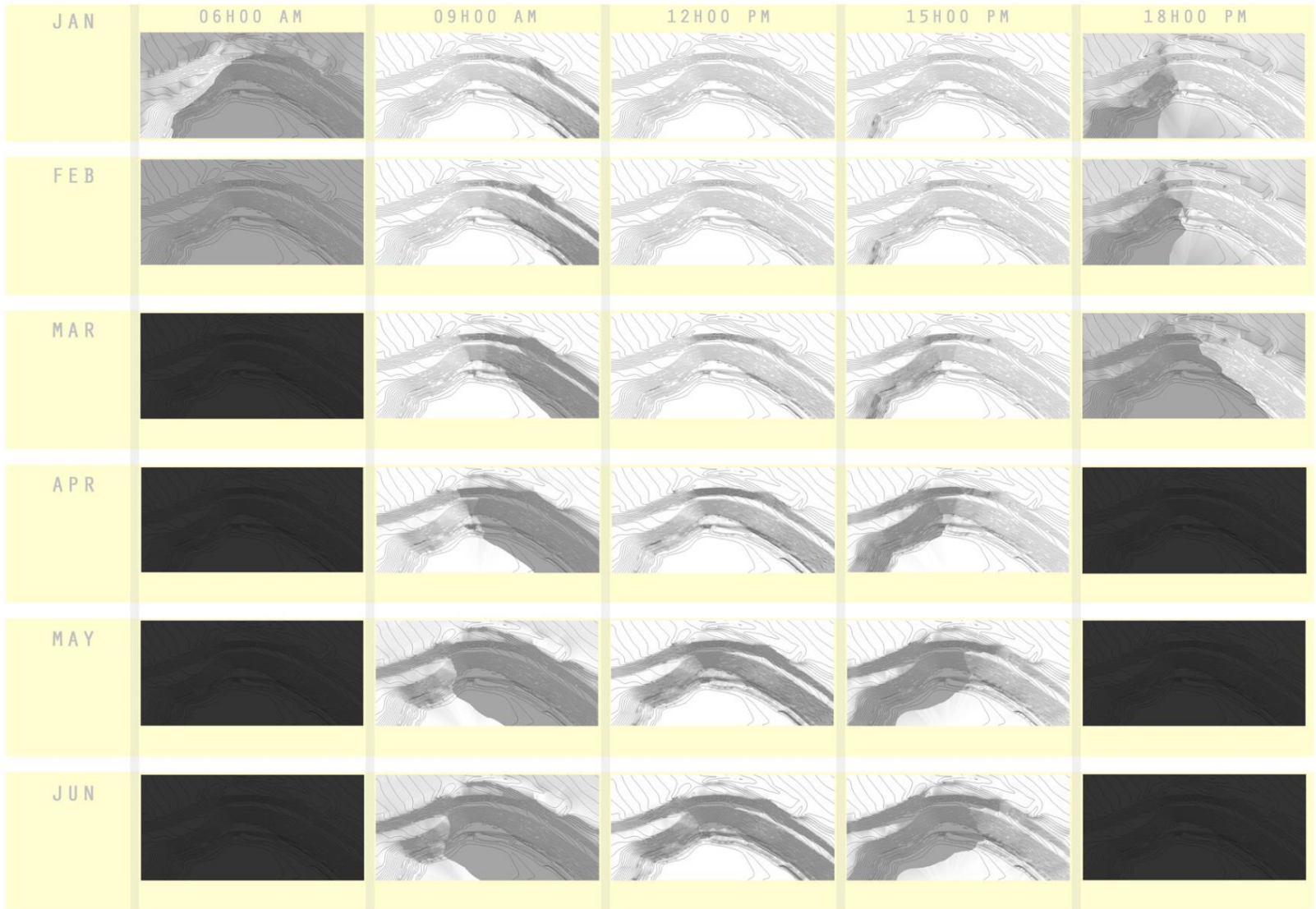
AREAS AT WATER LEVEL ACCESSIBLE FOR DISABLED PEOPLE



MOST APPROPRIATE LOCATION FOR PROPOSED FOCUS AREA

Figure 72: Appropriate focus area location  
(Author 2013).

6.9.3 Solar investigation:



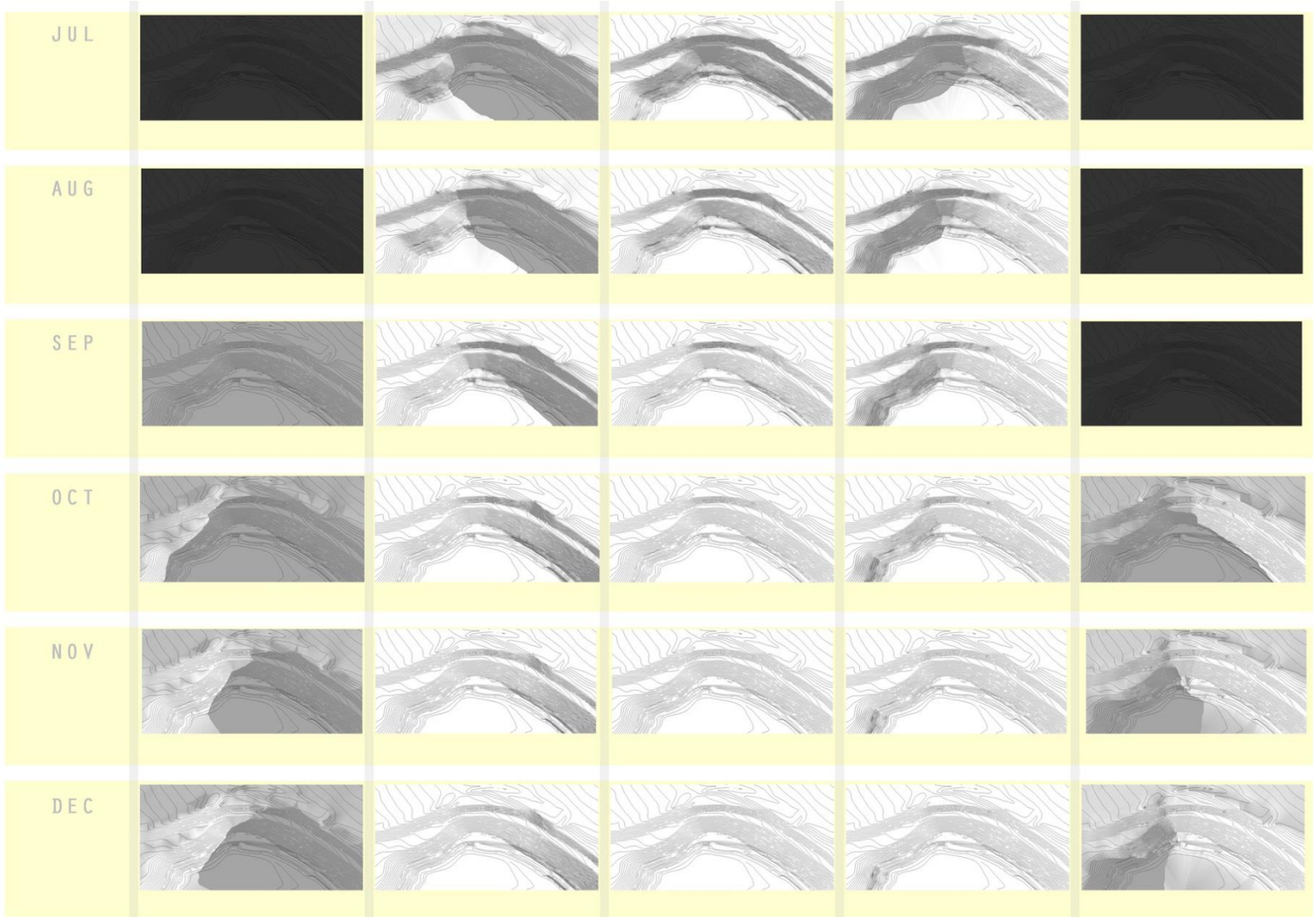


Figure 73: Sun angle study (Author, 2013).

## 6.10 DESIGN DEVELOPMENT

### 6.10.1 Design development, exploration in plan:

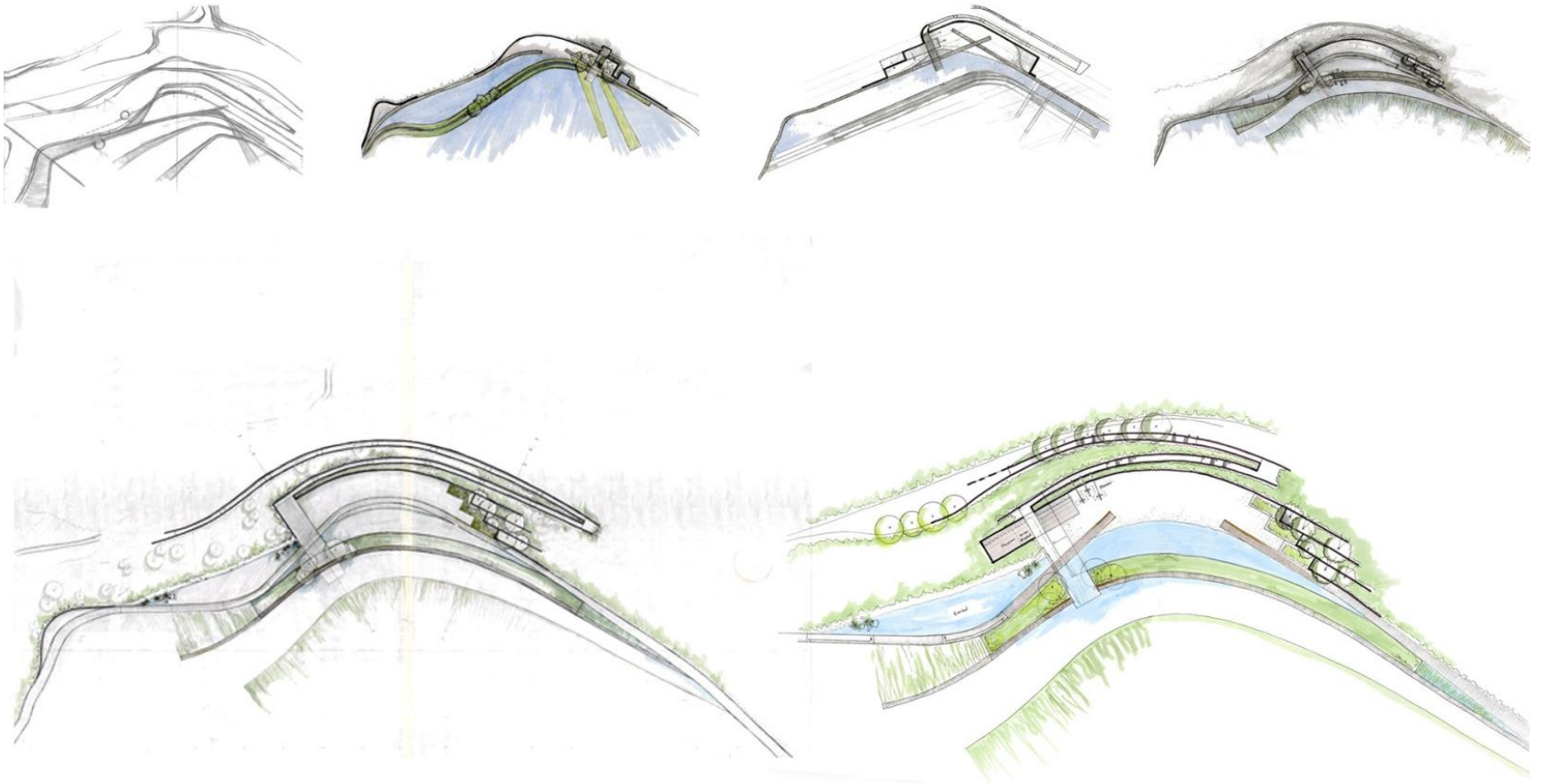


Figure 74: Design Development of focus area  
(Author, 2013).



6.10.2 Proposed sketch plan design:

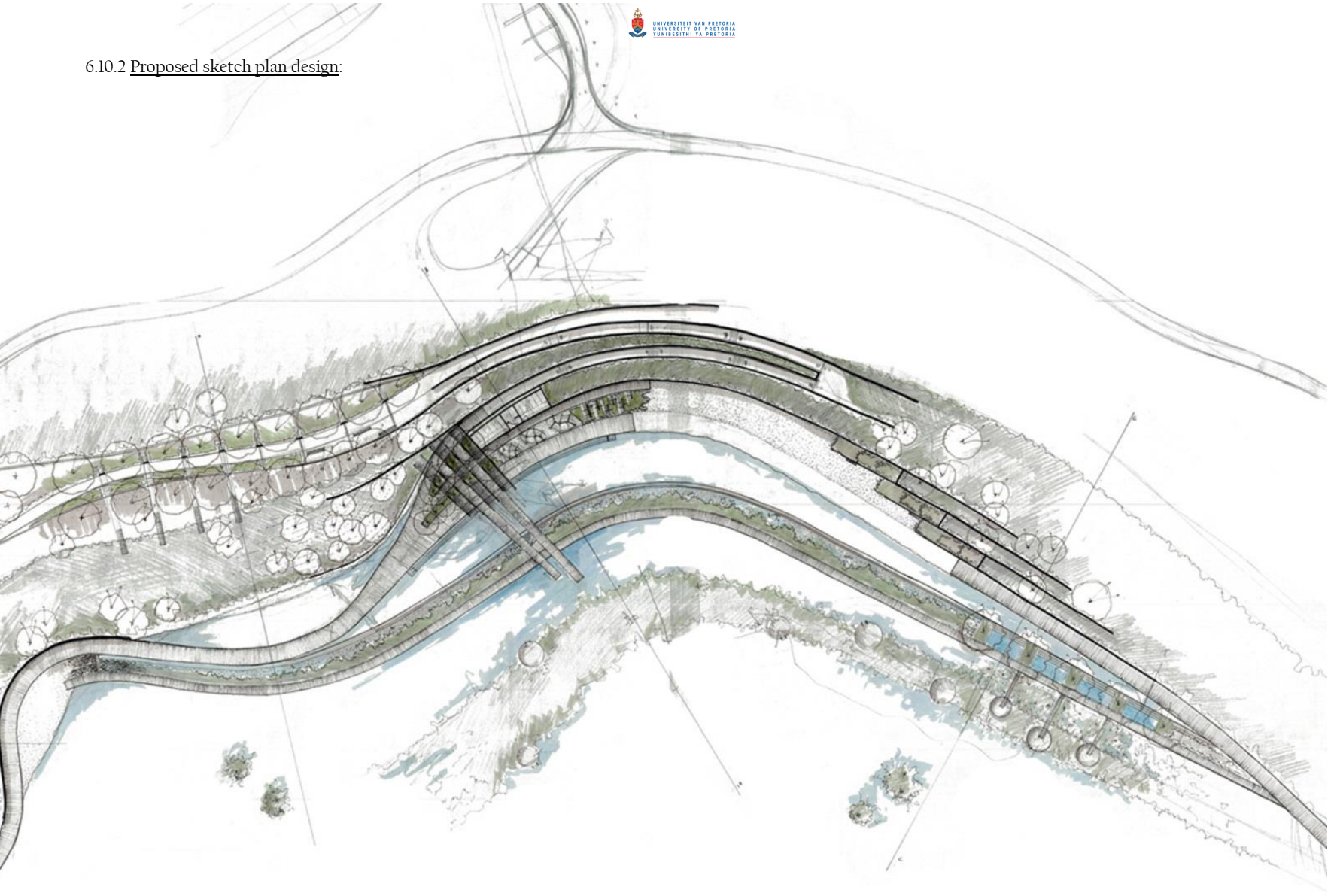


Figure 75: Proposed swimming area design, not to scale  
(Author, 2013).

6.10.3 Design development exploration in section:

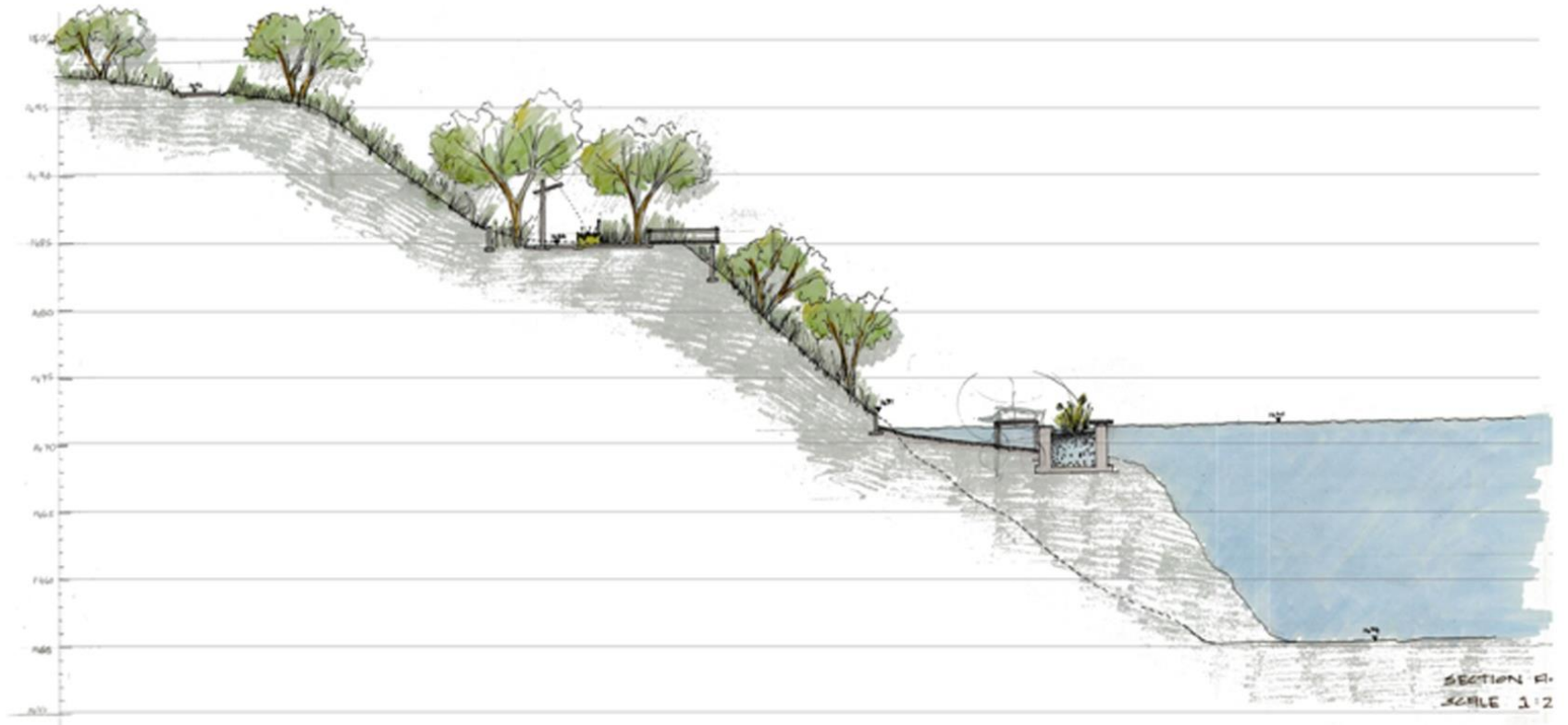


Figure 76: Section a-a, not to scale (Author, 2013).

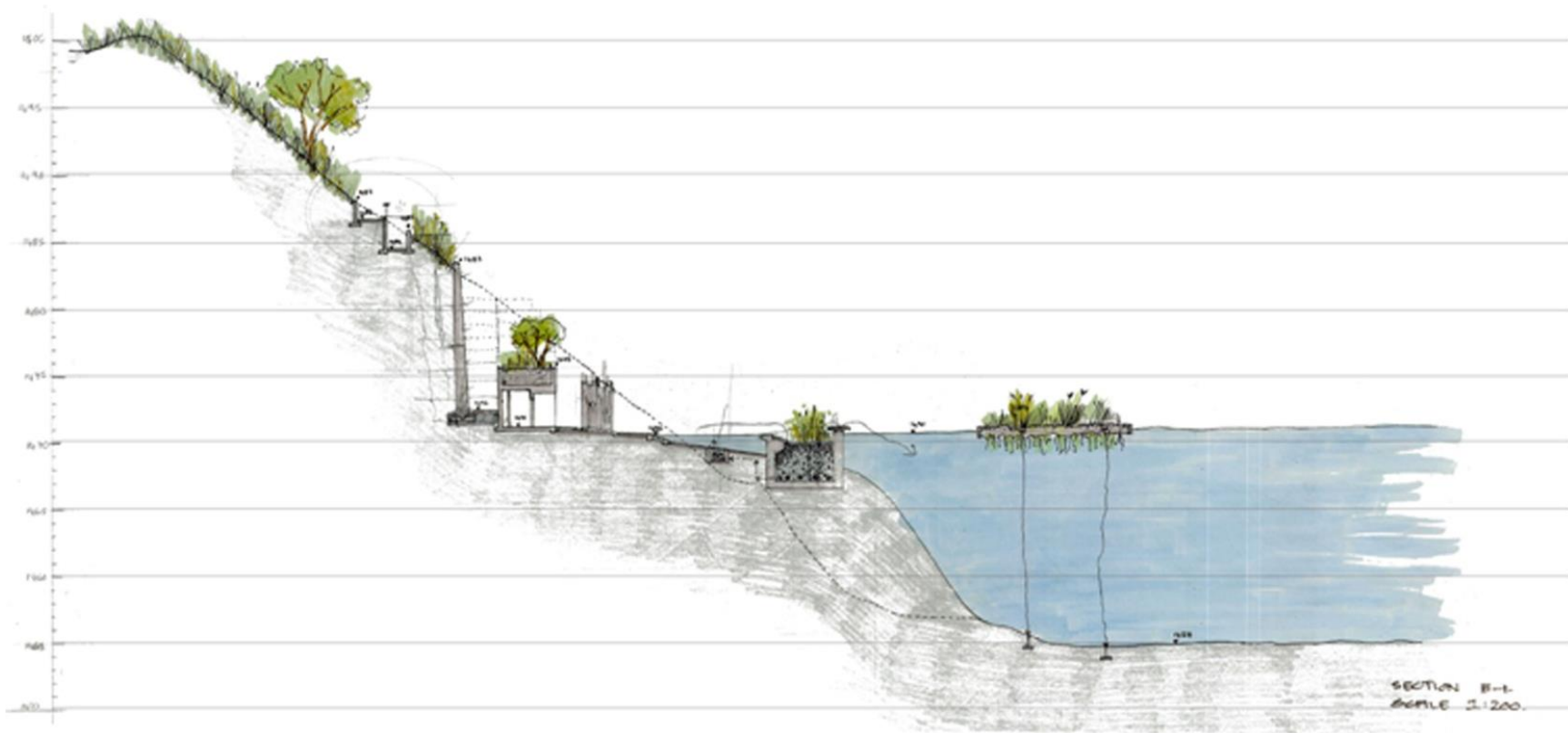


Figure 77: Section b-b, not to scale (Author, 2013).

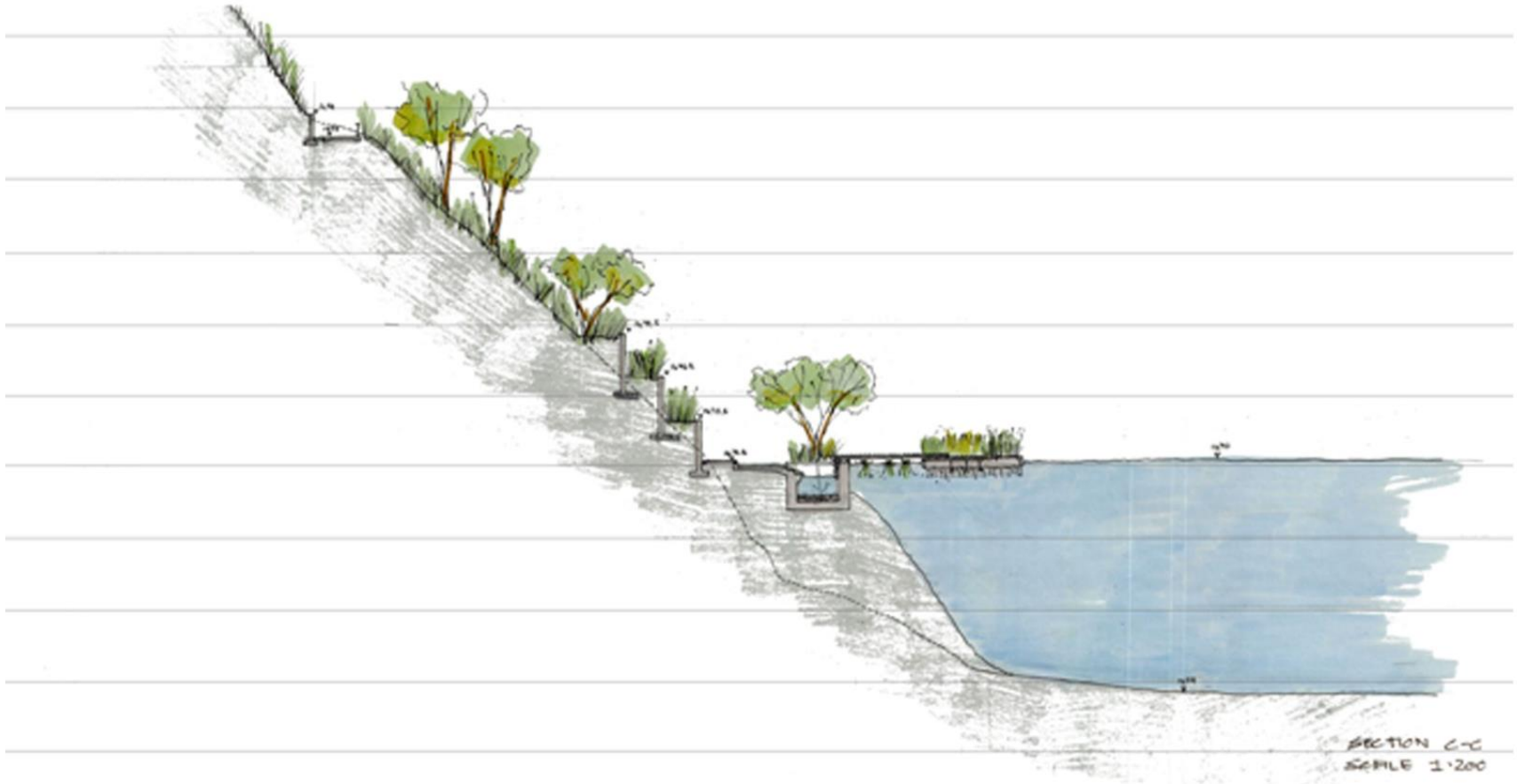
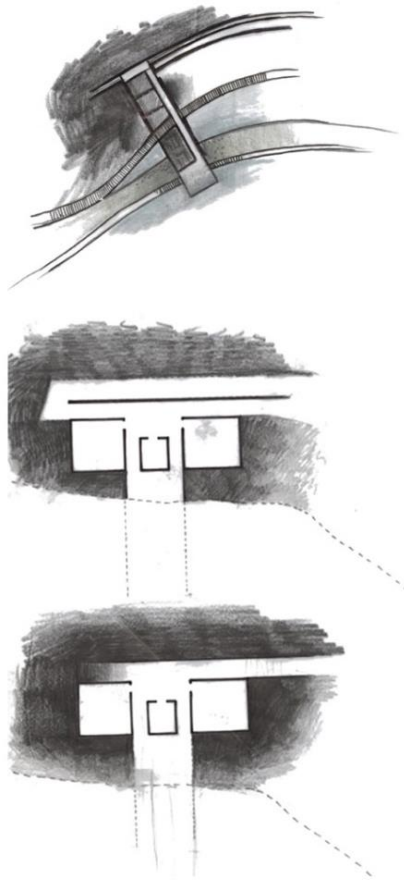
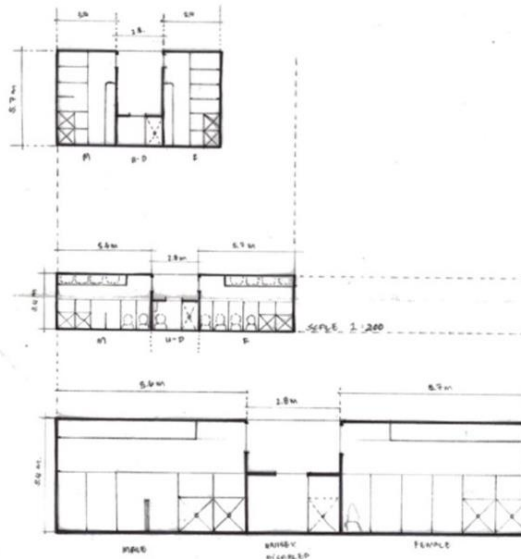


Figure 78: Section c-c, not to scale (Author, 2013).

6.10.4 Design development of ablution facilities:

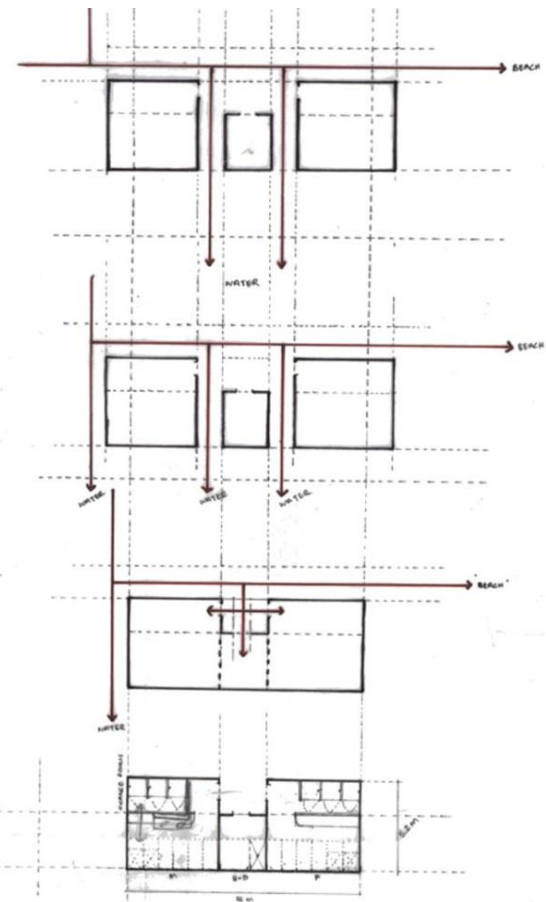


FORM DEVELOPMENT



200 mm  
0.2 m  
2 m

CALCULATIONS ON NUMBER OF STALLS NEEDED



CIRCULATION AND MOVEMENT OF USERS

Figure 79: Ablution facilities, design development, not to scale (Author, 2013).

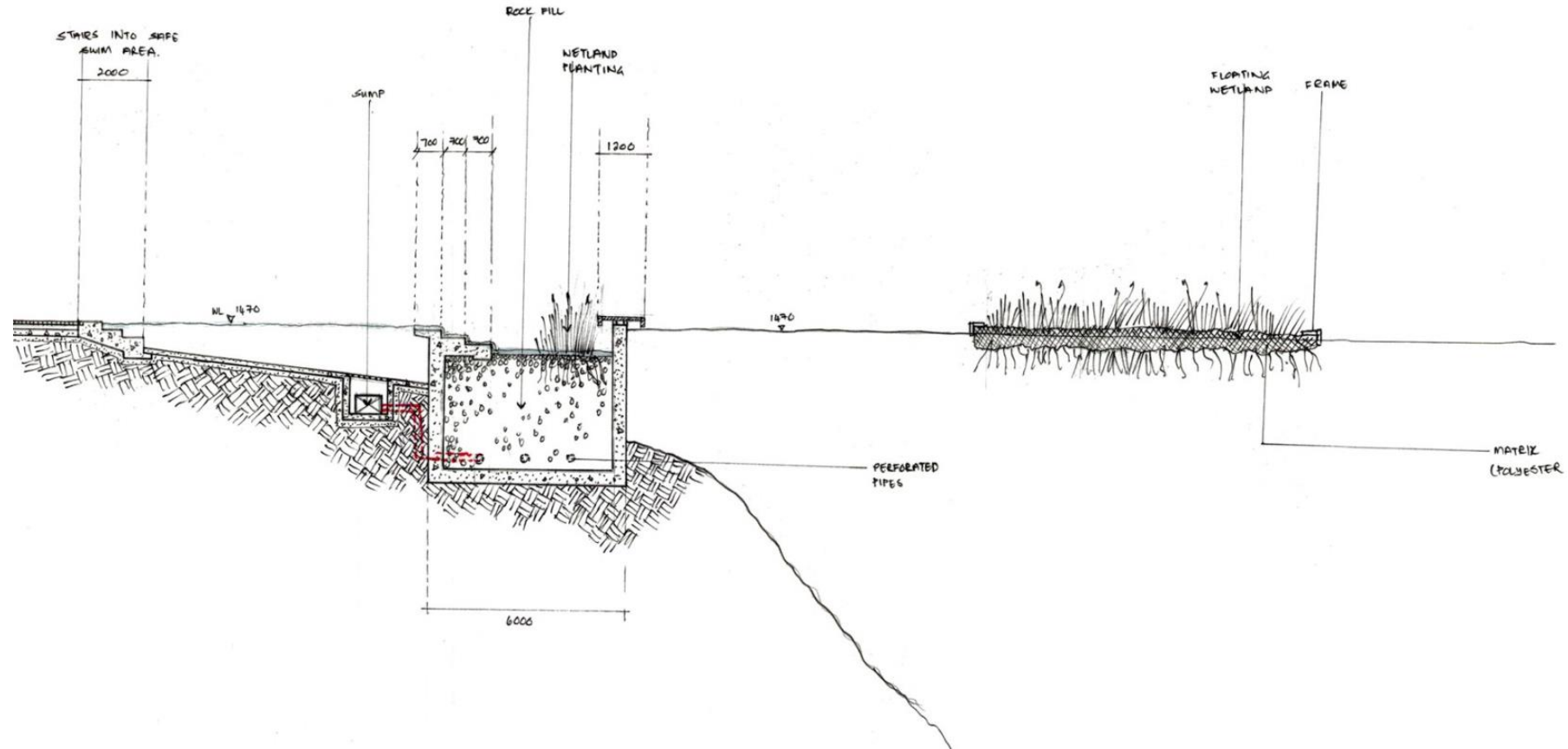


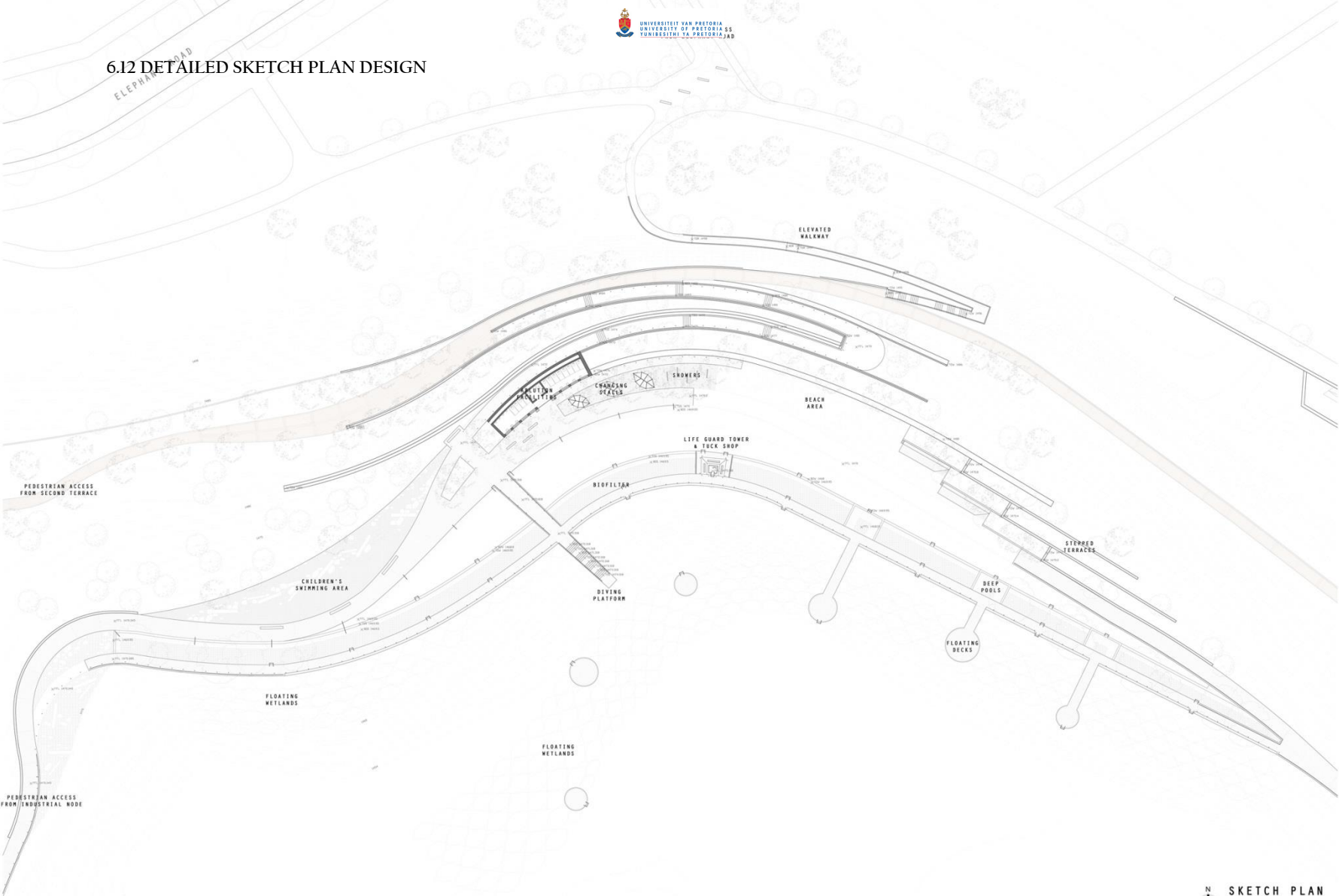
Figure 80: Bio-filter and floating wetland detail exploration, not to scale (Author, 2013).

# 6.11 FINAL SKETCH PLAN DESIGN



Figure 81: Final sketch plan, not to scale (Author, 2013).

### 6.12 DETAILED SKETCH PLAN DESIGN



N SKETCH PLAN

Figure 82: Detailed sketch plan, not to scale  
(Author, 2013).



### 6.13 LIGHTING PLAN

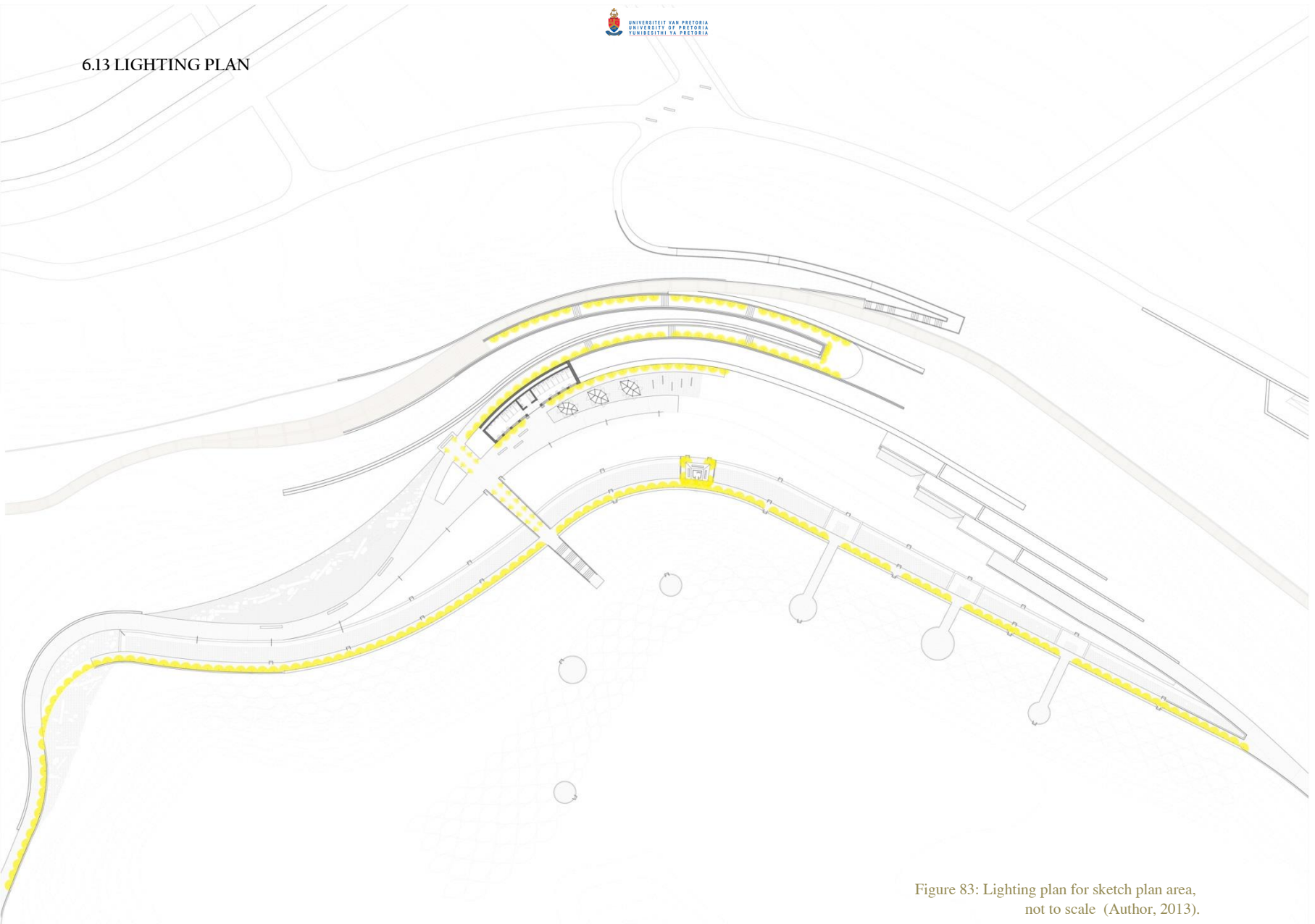


Figure 83: Lighting plan for sketch plan area, not to scale (Author, 2013).

6.14 SECTION OF SKETCH PLAN AREA



Figure 84: Section A-A,  
not to scale (Author, 2013).

## 6.15 ATMOSPHERIC PERSPECTIVES

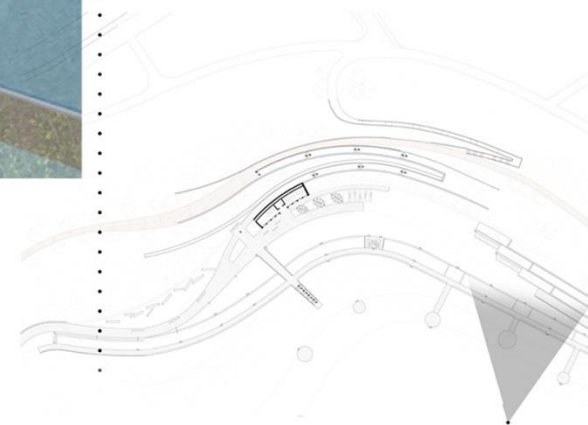


Figure 85: Perspective from the floating wetlands towards the beach area, not to scale (Author, 2013).

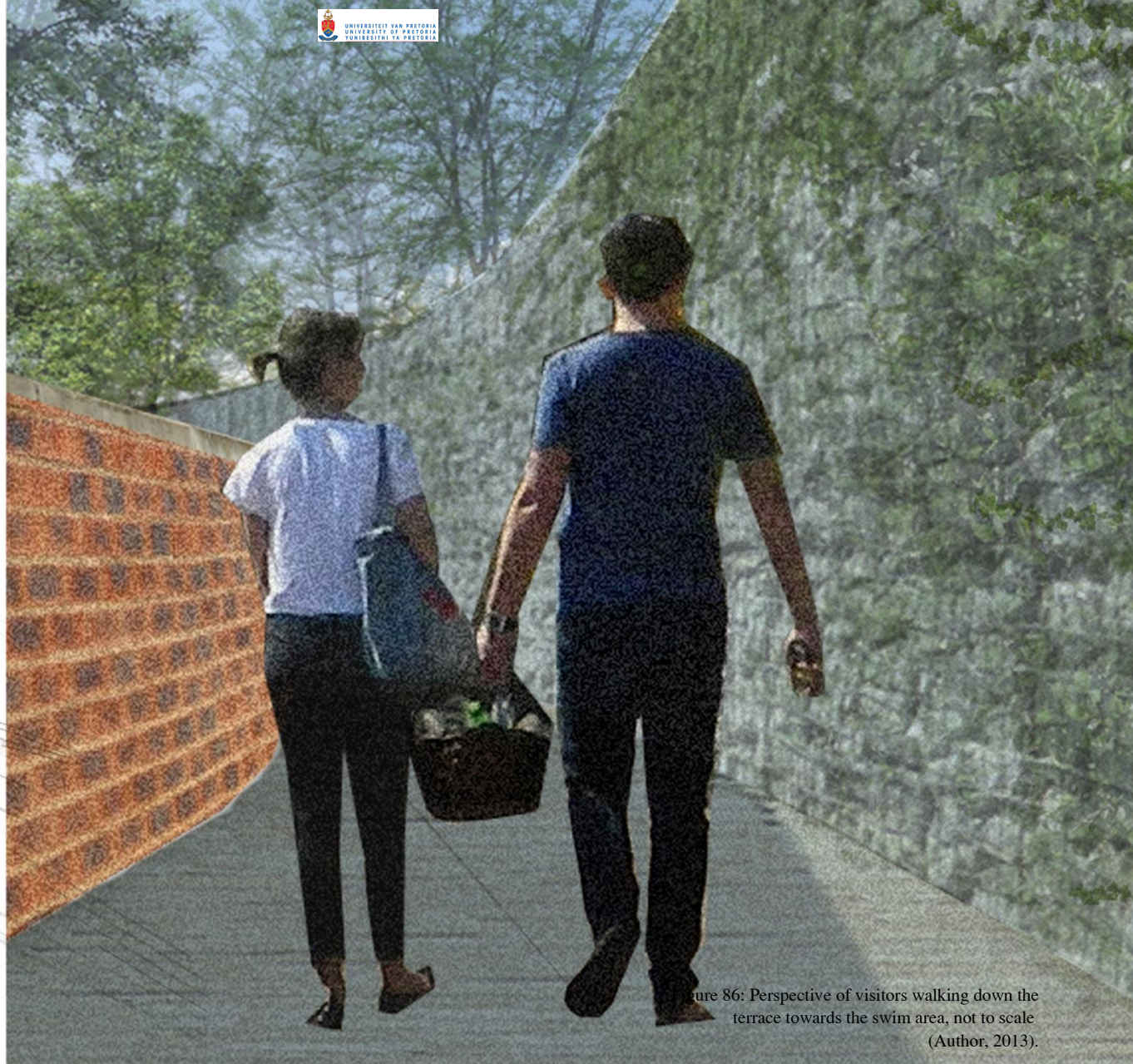
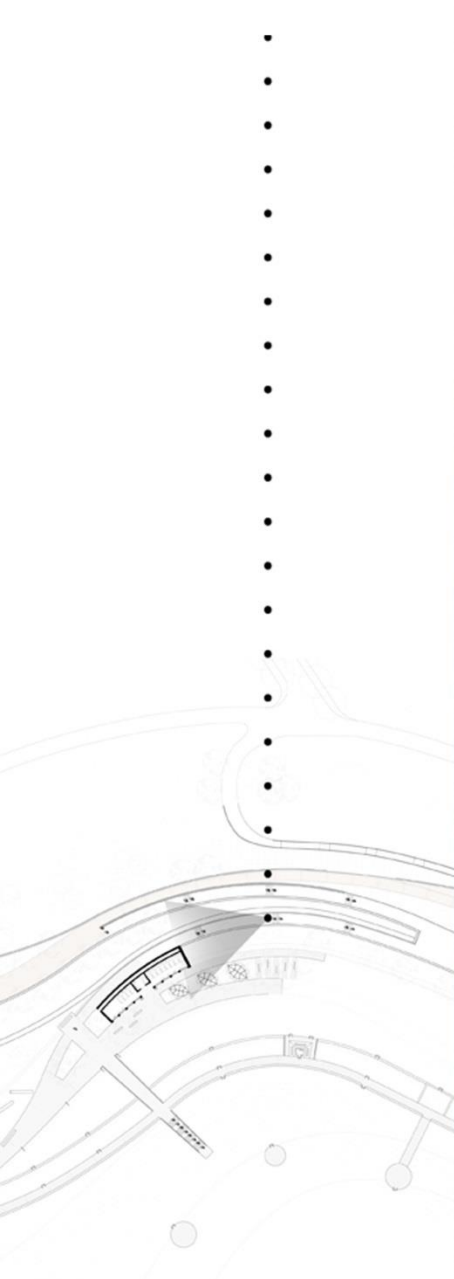


Figure 86: Perspective of visitors walking down the terrace towards the swim area, not to scale (Author, 2013).

## 6.16 CONCLUSION

With the design of the entire sketch plan, for the swim area within the quarry's water body, several structures and systems have been incorporated in order to provide clean water to swim in, as well as safe swim areas for children, and a variety of water spaces. Access to the swim area from the terraces has also been provided for. This access, as well as the beach area created, is extreme interventions into the sloping edge of the cliffs. The interventions to create spaces along the water's edge and providing access to the facility, the processes of construction and rehabilitation of damaged areas, as well as the systems incorporated within the design has been proposed on a conceptual and programmatic level, but will need to be technically resolved. Further detailed investigations and design adaptations must be considered and explored.



007

TECHNICAL INVESTIGATION

Bio-filters – Floating Wetlands – Retaining Walls

Figure 87: Panoramic view from south eastern terrace.  
Photographed by Author (2013).





## 7.1 INTRODUCTION

The following technical investigation and resolutions are aimed to give expression to the main concepts of *genius loci* and the creation of *archetypal landscapes* through the consideration of *archetypal actions*. Material choices and construction methods will be inspired by the history of the terrain including its function and character, as well as the current characteristics expressing the spirit of the place. The technical design investigation will focus on two main elements:

- The technical resolution in terms of *system* and *process implementation*,
- And the *phenomenological approach* towards technical resolutions.

Five main elements within the focus area will be focussed on for the detailed or technical design resolution. All five of these elements has systems or processes as a main focus whereas the phenomenological approach to their further technical development will be determined by the choice in materials and plants. These five elements consist of the design and construction of the retaining walls within the steep slope of the water's edge, the rehabilitation of the focus area after major construction took place, the detail resolution of the bio-filter system constructed within the water, the resolution of the floating wetlands and the pedestrian access to these floating elements, and the technical resolution of the ablution facilities.

## 7.2 PHENOMENOLOGICAL APPROACH

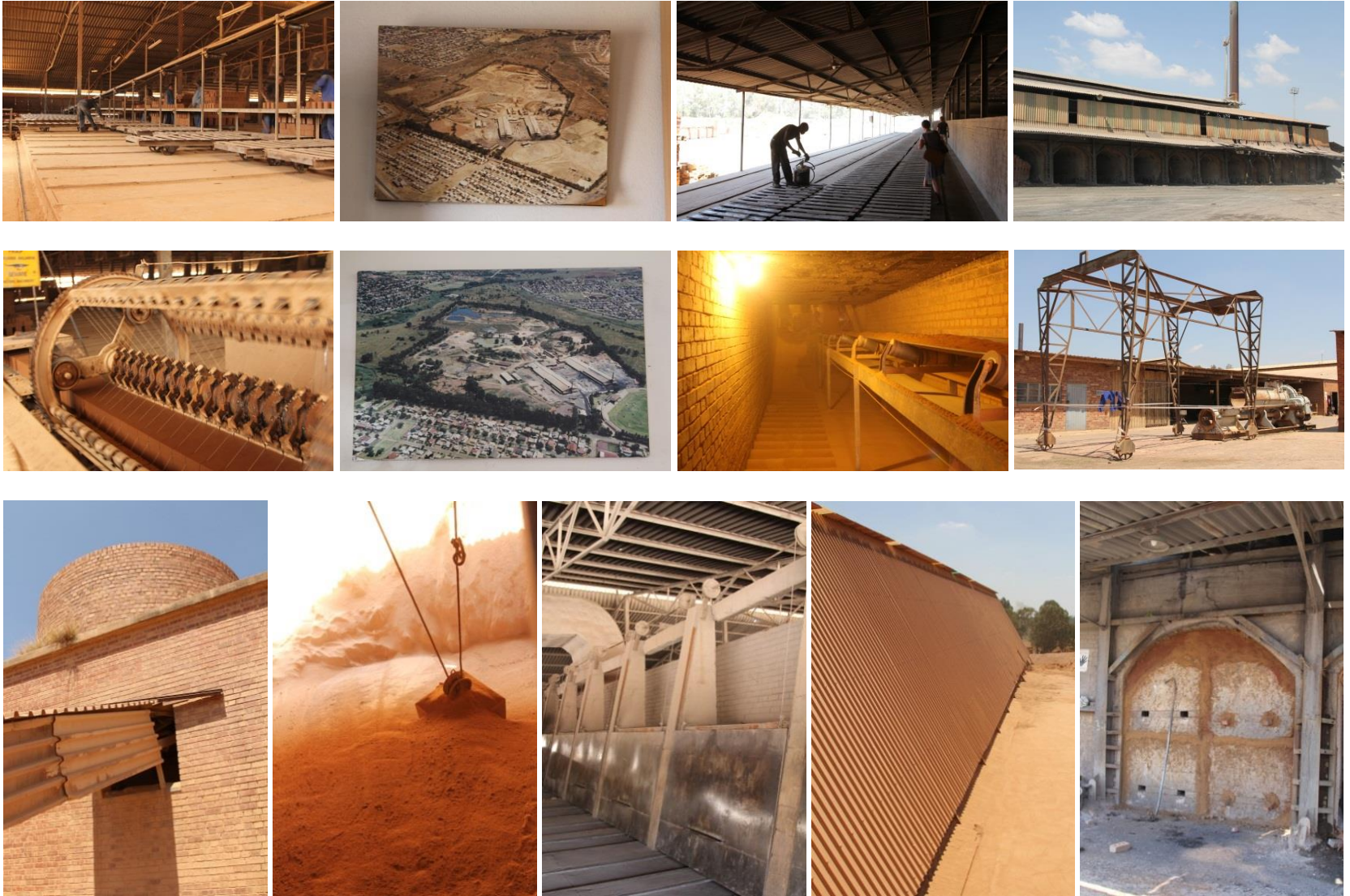
The phenomenological approach to the technical resolution will consist of the material and plant palette. These elements will influence and create the atmosphere of various spaces within the designed landscape.

### 7.2.1 Material palette:

The Rosema & Klaver Brickworks quarry is owner to a range of textures, patterns, forms, spaces, and materials, that has been discussed to an extent in PART 1 & 2. In order to ensure that this specific materiality are captured, conserved, and finally celebrated the new construction materials and designs should consider the existing. A photographic documentation of the materiality, spaces, and form of the site has been undergone in order to formulate a material palette that will best suit any new implementations.

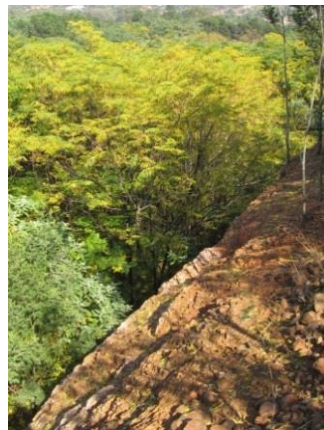
#### 7.2.1.1 Possible Representation of the Brickworks in Operating Condition:

ERA Brickworks in Eersterust is one of the more reserent and still operating brickwork quarries of the original Rosema & Klaver Company. As a framework group the site was visited in order to get a feel of how the original brickworks must have been like when it was still operational. The ERA Brickworks is a near replica of the once Rosema & Klaver Brickworks. A few photographs are put together to communicate the experience on site:



Figures 88a-m: Photographs of ERA Brickworks in Eersterust. Photographed by Ingmar Büchner (2013).

7.2.1.2 Historic Remains & Current Status  
on Site:



Figures 89a-m: Photographs of historical remains and current status on site. Photographed by Author (2013).



Figures 90: SVcb 10 Gauteng Shale Mountain Bushveld: Typical semi-open bushveld on rocky slope with a variety of woody species, including *Cussonia spicata*, *Euclea crista* and *Dombeya rotundifolia* in Groenkloof Nature Reserve, Pretoria. The tall grass in the foreground is *Hyparrhenia dregeana* (Mucina & Rutherford 2006:467).

In conclusion it is clear that the main materials found on site, are concrete and clay brick. Materials once used to construct the original buildings on site were concrete, clay bricks, corrugated iron sheeting, and steel. This materiality reflects the genius of place on site and needs to be incorporated or taken in consideration when material choices are made.

### 7.2.2 Planting strategy:

Within the detail design of the public swimming area in the quarry various micro climates are created due to the current form of the landscape and its steep cliffs, as well as the new design interventions.

As stated in Chapter 2, two vegetation types are considered for re-establishment on the entire site. For the focus are the vegetation type known as SVcb 10 Gauteng Shale Mountain Bushveld (Appendix B) is the appropriate choice due to the shale soil conditions on this side of the Old Rosema & Klaver Brickworks quarry. Within the phenomenological approach to technical resolutions of the five identified elements, plants from this vegetation type will be selected. In the case that plants will be chosen for various other aesthetic or atmospheric reasons in order to define specific spaces, indigenous species will be selected. These species will be chosen so that they can fulfil the aesthetic requirements, but simultaneously apply to requirements such as requiring low maintenance, being hardy and drought resistant, and finally be able to grow in shale soil conditions and possibly steep soil gradients.

### 7.3 RETAINING WALLS

Several retaining walls will be constructed within the focus area in order to create a beach area for bathers to relax and play and to provide for access from street level and from the higher terraces. With the construction of the retaining walls a systemic approach will be followed of cutting from the steep cliffs for the creation of the beach area and the ablution facilities, tuck shop, showers and changing rooms. The soil excavated will be moved into the water body to fill, for the purpose of creating a shallow area within the water body for accommodating inexperienced swimmers or swimmers who would like to swim in a safe and shallow environment. The retaining walls currently proposed are as high as 10-11 metres and the opportunity to propose slanting retaining walls are very limited due to the lack in space. The retaining walls should lead the visitor from a space on top of the terrace, into a space cutting into the face of the steep slope. This space is proposed to be a width of 2 metres and could create a very uncomfortable and unsafe space with extremely high walls on both sides of the pedestrian walking down the slope. In this case it could be considered that the opening at the top of the retaining walls is wider than the 2 metres span at the foot of the retaining walls. The materiality of the retaining walls becomes a very important aspect in creating a sublime atmosphere when pedestrians walk down the slope. A few possibilities in retaining walls will be discussed in order to aid in the final decision making.

#### 7.3.1 Possible retaining walls for consideration:

##### A. CONCRETE:

Concrete retaining walls have various advantages to it, but the shuttering and finish of in situ concrete is a major cost factor. Concrete takes on the shape of the shuttering, providing a designer with the opportunity for exciting shapes and finishes. Execution on site does require a lot of craftsmanship and the efforts of a professional team (Wegelin 2008:2.1-2.4).

Concrete is a material known for its long life span due to its durability, influencing the level of sustainability of the material (CNCI 2013). With the use of admixtures reducing the use of cement and water content in mixes, and the simultaneous use of cement extenders such as fly ash, ground granulated blast furnace slag (ggbfs), and silica fume the initial cost of the concrete is reduced. These added materials to the concrete have also been found to have a great effect on the durability, embodied energy and sustainability of concrete (CNCI 2013).

In conclusion concrete may be a material that requires a lot of craftsmanship but the advantages of this material are endless. Structures are erected at a fast rate, the material provides endless possibilities in terms of form and size, and an important aspect is this materials long life span.

##### B. BRICK MASONRY RETAINING WALLS:

Brick masonry walls may not be constructed where the soil they retain is loaded within a distance equal to the height of the wall (Wegelin 2008:7.8). Therefore a brick masonry retaining wall for the construction of 10-11 metre high walls will not be viable since in this scenario the wall will retain soil that is loaded within a distance equal to the height of the wall. Brick masonry can

be considered as a facing in front of a concrete retaining wall if such a finish is desired.

##### C. CONCRETE RETAINING BLOCKS:

This type of retaining wall is an economical and fast way of constructing retaining walls (Wegelin 2008:7.8). The blocks are filled with soil and therefore plant growth is allowed. The blocks are placed in rows and are set back from the row below to provide batter or slope for added stability, followed by the backfilling of soil behind the rows. This batter angle is a function of wall height and soil type and the higher the wall or the less stable the soil, the greater the batter angle needs to be (Wegelin 2008:7.8). Therefore in the case of 10-11 metre high proposed retaining walls and the lack of stability from the shale this construction option is not ideal. Space for the batter angle is not available in the designed area.

##### D. GABION WALL STRUCTURES:

Gabions are used to retain soil or prevent cases of soil erosion. These structures allow vegetation growth that simultaneously assists in hiding the structure if this finish is unwanted by the designer. Other advantages of building gabion walls are the fact that they are strong, flexible, and permeable, and allow fast construction at a low cost and can be built by unskilled labour. Locally obtained stone can be used in filling the steel-wire mesh cages (Wegelin 2008:7.12). This construction material proves to be an ideal option due to all the advantages listed. Stone on site or brick and concrete remains found on site could be used to fill the cages. Excavated rock material from other building sites can be re-used to fill gabion cages. Planting can assist in covering the mesh and break the harshness of the steep walls.

A further possibility exist to use a different kind of gabion structure, known as Terramesh from Maccaferri Inc.. This system can form a vertical structure that can reach a height of eleven meters easily. The wire mesh or the gabions form an anchor within the retained soil (see figure 90).

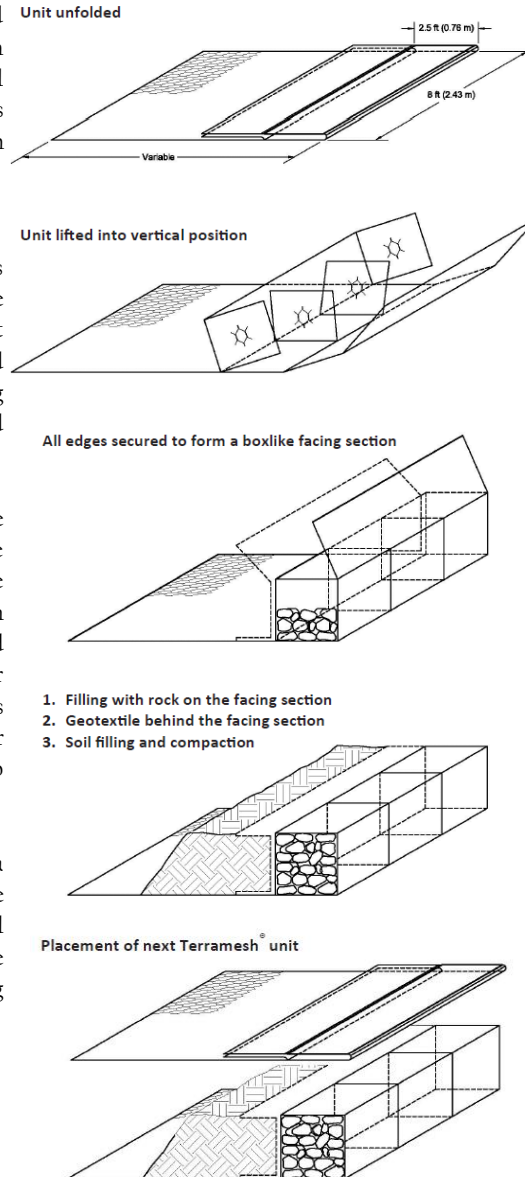
### E. CONCRETE CRIB WALLS:

Concrete crib walls are gravity retaining walls consisting of interlocking, precast concrete components. This building material are low cost and can be quickly and inexpensively erected (Concrib Brisbane 2013). This type of retaining wall can also be vegetated but do form a rigid and monotonous finish.

**In conclusion** the desired retaining wall would be one of concrete or brick in order to relate to the materials already existing on site. At the same time the gabion retaining wall (Terramesh system) do have numerous advantages in use and if covered in planting could create a space similar to that of a cliff or valley as the pedestrian walks down the slope. The concrete crib wall has similar advantages to that of the gabion wall and is also an ideal option.

When aesthetics are taken into account a combination of gabion (Terramesh) and concrete walls will be used. A concrete retaining wall will be used in areas where the wall height is not more than four metres in height and a gabion retaining wall will be used on the higher retained areas.

Figures 90: Terramesh system (Maccaferri, 2013).



## 7.3.2 Phenomenological design:

### 7.3.2.1 Material choice:

#### - Gabions:

Gabions will be used in the construction of the retaining wall. The steel-wire mesh cages are filled with rocks, but the front facing gabions can be filled with a rock type providing a more aesthetic finish prior to the wall being vegetated with planting.

#### - Concrete:

Concrete retaining walls will be used in areas not higher than 4 meters. The desired finish for these walls should reflect a similar finish to the materials found on site. The author proposes a exposed fine aggregate finish.

### 7.3.2.2 Planting Strategy:

For the purpose of establishing plants on the steep facades of gabion retaining walls, as well as on the steep sloping areas adjacent to the newly proposed retaining walls, plant species will be selected from the specified vegetation type. Species selected from this vegetation type will need to be adapted to these conditions. Additional species will be selected for aesthetic and atmospheric reasons. Planting associated with valleys of cliffs, indigenous to South Africa and adapted to the site conditions, will be selected.

The following species will be used:

Trees:

- Ficus abutilifolia* (Large-leaved Rockfig)
- Cussonia paniculata* (Mountain Cabbage Tree)
- Ficus ingens* (Red-leaved Rockfig)

Large shrubs:

d. *Diospyros lycioides* (Bluebush)

e. *Buddleja salviifolia* (Sageweed)

Medium shrubs:

f. *Bauhinia galpinii* (Lowveld Bauhinia)

Small shrubs:

g. *Barleria obtusa* (Bush violet)

h. *Felicia filifolia* (Wild Aster)

Herbaceous perennials, Groundcovers and Bulbs:

i. *Aloe greatheadii* var. *davyana* (Veld Aloe)

j. *Cotyledon orbiculata* (Pig's Ears)

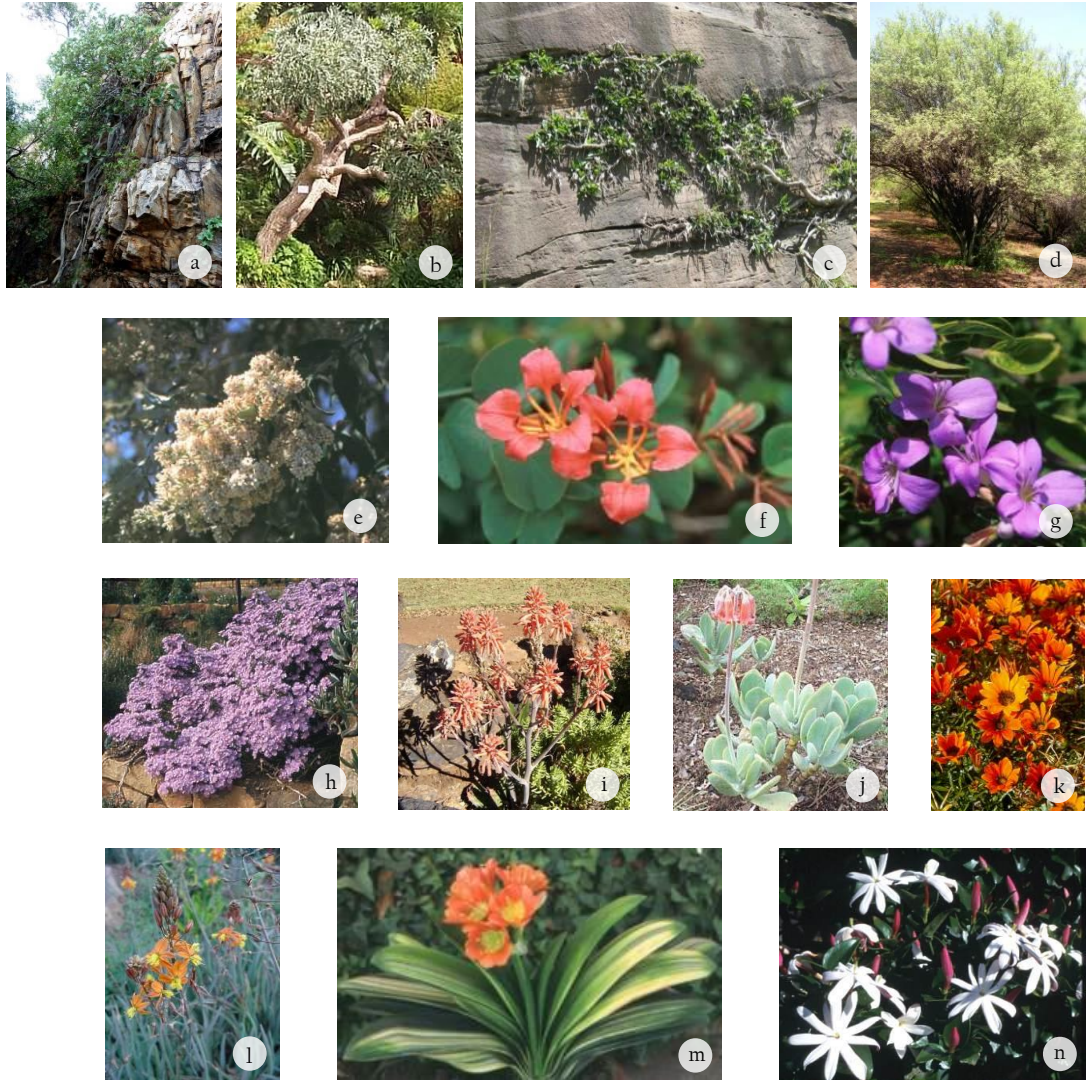
k. *Gazania krebsiana* (Gazania)

l. *Bulbine frutescens* (Stalked Bulbine)

m. *Clivia miniata* (Bush Lily)

Climbers:

n. *Jasminum multipartitum* (Starry Wild Jasmine)



Figures 91a-n: Planting strategy for Terramesh retaining wall (PlantzAfrica 2013).

## 7.4 REHABILITATION STRATEGY

After the construction of the retaining walls and the forming of the beach area and filling areas in the water with soil cut from the slope, the entire site can be rehabilitated. The process of rehabilitation will be a systemic approach and will aim to re-establish indigenous plants from the vegetation type SVcb 10 Gauteng Shale Mountain Bushveld. Research on this topic was done by the author through a photographic investigation of Groenkloof Nature Reserve. This reserve is located close by to the Old Rosema & Klaver Brickworks quarry and represents a natural area with similar vegetation characteristics to those found in the Gauteng Shale Mountain Bushveld vegetation type. The author also interviewed Dr. Lenie Venter (on 15 July 2013), an environmental rehabilitation consultant at PPR Technologies in order to find out the necessary steps and time frame within such a rehabilitation process. Mr. Jason Sampson, curator at the Manie van der Schiff Botanical Garden at the University of Pretoria (interviewed on 30 July 2013) were also consulted to gain more knowledge on species application for steep cliffs such as these on the Old Rosema & Klaver Brickworks site. This the information gathered through the photographic investigation and the knowledge gained from the interviews, the author proposes the following rehabilitation strategy for the focus area.

### 7.4.1 Systemic design:

The rehabilitation process for the focus area will be similar to what will be applied on the rest of the Old Rosema & Klaver Brickworks site. A step-by-step process will be discussed and linked to a time frame.

#### Step 1:

The main current issue on site is that of soil erosion and stabilisation due to steep cliffs not covered in any vegetation. The first approach will thus be to plant all the bare areas with a fast growing species that will aid in soil stabilisation. A species recommended by Jason Sampson is a grass species known as vetiver (*Chrysopogon zizanioides*). This is a perennial species native to India and form horizontally spreading, mat-like root systems of which can reach a depth of 2-4 metres. Though this species is native to India the most commonly used commercial genotypes of the species are sterile. This means that the species is non-invasive and after a period of more or less ten year the species will have died and no longer exist on the site. After this period indigenous species re-establishment will already be at an advanced level (Sampson, 2013).

#### Step 2:

After the vetiver has been planted a management process starts where all small Black wattle tree species will be eradicated. This process will need to be continued for years to come and any new plants will need to be removed immediately. No large and established Black wattles will be removed because these species currently aid in keeping soil in place.

Simultaneously to the removal of the small Black wattles, a process will start to plant a combination of the dominant tree and grass species of the specified vegetation type. The area for rehabilitation will be divided into a grid and the combination of dominant species will be planted according to this proposed grid. Only dominant species of the vegetation type will be

planted for now until they have established themselves and created a micro climate more appropriate for other plant species of the vegetation type to establish themselves.

#### Step 3:

As dominant tree and grass species from the specified vegetation type has established successfully other species from the vegetation type will be planted in-between the dominant species. Through the process a new plant community will establish on site. Other black wattles will still grow between these indigenous species but the management of the site will keep small and new Black wattles and other invasive species under control.

#### Step 4:

When the vegetation type, SVcb 10 Gauteng Shale Mountain Bushveld, is established on site and tree species have reached a relative 'full-grow' height and species are increasing in numbers, a next phase in rehabilitation starts. During this next phase larger Black wattles can be cut down. These trees can be cut at ground level and treated with a chemical to prevent regrowth. The roots of the tree do not have to be removed in order to keep the soil in place. Regular maintenance of the terrain will be needed from the start of the rehabilitation process, up to a time frame of at least 10 years. The first five years will be an intensive maintenance process, after which regular maintenance and removal of invasive species will continue for another 5 years. After this 10 year period the entire site's new vegetation type will be established and a new maintenance plan will be created for the years to follow.



## 7.5 STRUCTURE OF THE BIO-FILTER

The bio-filter structure is situated in the water body. This structure creates a barrier between the shallow swim area and the deeper open water of the water body. This structure's purpose is to create the barrier, but importantly, to clean the water of the shallow swim area.

As previously stated in Chapter 2 (section 2.4.1) the water level (at 1470 meters) of the water body is constant and will not fluctuate unless surface water runoff from the surrounding cliffs enter the water body. As proposed in the framework, the water body's size will be increased through a shallow wetland area to the west of the water body and site, along the central 'puinhoop'. If any additional runoff enters the water body, the overflow will flow into a second wetland area, situated on the western edge of the site, after which it will overflow into the storm water system at street level.

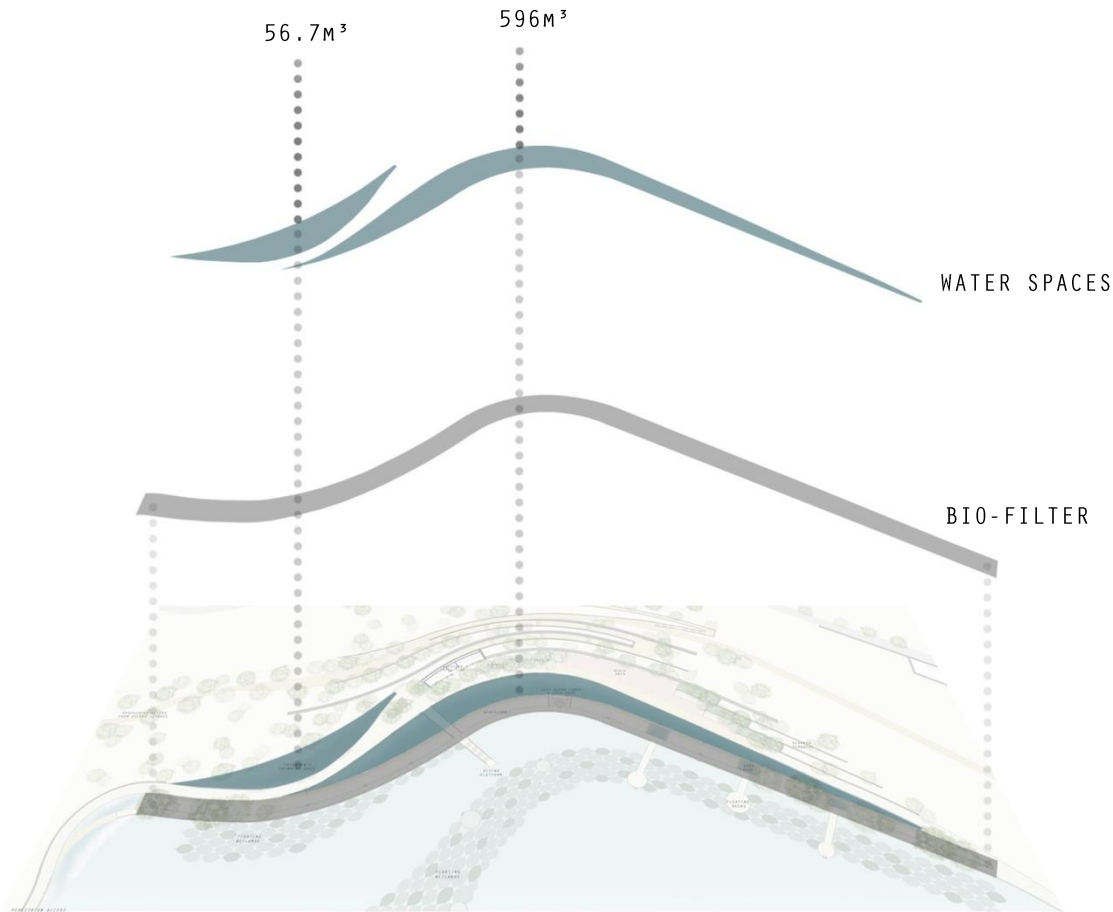
The water quality of the water body is good, since it is constantly fed by ground water. The only element that could influence the water quality is that of the entering surface water runoff. As proposed in the framework, the rain water falling on areas surrounding the water body will be captured and temporarily stored in detention ponds. Any overflow from the detention ponds will enter the most western wetland. Thus only debris from the cliffs could enter the water body and influence its quality. When plant re-establishment takes place the amount of debris will decrease since soil surfaces will be covered in vegetation.

The purpose of the bio-filter system is thus to use an environmentally friendly method of cleaning water. Since people may have different perceptions of swimming within a natural area and the possibility may exist that they may avoid the activity due to personal preferences, the author decided to not only create a safe swim area for people to swim in but also a clean swim area. Free from any subsurface plants or objects. Therefore the shallow swim area will provide people with the opportunity to experience the activity of swimming in a natural area without having any uncertainties about the quality of the water or the clarity, and thus hesitations about entering the water. The opportunity will exist for the adventurous type to cross the structure of the bio-filter and explore the deeper waters, as well as swimming towards the floating wetlands, at their own risk.

### 7.5.1 Systemic design:

The bio-filter system is a structure filled with rocks and loose gravel and planted with aquatic plant species. It is recommended to use a diversity of indigenous adapted aquatic plants, including submerged, emergent and floating plants (Natural Swimming Pools, 2013). Bacteria attach to the rocks and gravel in the system, serving as an additional biological filter. The aquatic species absorb nutrients out of the water, which assist in keeping key nutrient levels low and in balance so that algae is not able to grow. This system will ensure clear and clean water that allows seeing through to the bottom. In order to keep the water circulating a pump is needed to pump water from the shallow open water area, through the bio-filter filled with rocks, and back to the shallow water area (Natural Swimming Pools, 2013).

After consulting Anthony Philbrick, on 12 November 2013, new information was gained, and should be considered during the final detail design of the bio-filter structure. The swimming area needs to be the same surface area as the wetland/regeneration area in total. Usually the garden within the bio-filter or regeneration area is about 30 % of the total area. It would be ideal to use several pumps in order to have numerous pumps still circulating water when one of the pumps breaks. Another benefit of using various pumps is that one would use less power. It is also recommended to circulate the water through the entire system four to six times a day due to the high daily temperatures in Pretoria.



Figures 91: Water spaces and bio-filter location and sizes (Author, 2013).

The swim areas (water spaces) are divided into two zones. The smaller zone is the swim area for children, while the bigger zone is for youth and adults. The children's area is a depth of 0.6 meters and the bigger swim area is 1.2 meters deep on its western edge and becomes deeper to the east. The eastern edge of the bigger swim area is 2 meters deep. The swim area all together is a size of 652.7m³. The bio-filter is 2 meters deep, 6 meters wide, and runs along a distance of more or less a hundred meters. The total size of the bio-filter is 1200m³. The bio-filter structure is therefore twice the size of the swim area. Due to the fact that this will be a public swim area and the bio-filter becomes a space for activities to occur, and not only for cleaning water, this size seems suitable. The 652.7m³ of water will need to be circulated 6 times daily which means that a total volume of 3916.2m³ of water will circulate through pumps daily. 3916.2m³ of water is a total of 3 916 200 litres of water per day. Submersible pumps are available to circulate this amount of water and an additional strategy will be to have various pumps throughout the bio-filter structure, to circulate water as efficiently as possible.

### 7.5.3 Phenomenological design:

#### 7.5.3.1 Material choices:

##### - Concrete:

For the construction of the bio-filter structure, filled with gravel and planting, and the additional possibility of an attached walkway.

##### - Brick masonry:

Brick masonry can be used as a facing or finish.

##### - Composite Decking (Walkway):

With the use of composite decking visitors will be provided with an aesthetically appealing walkway but without the hazards of splinters or nails. These walkways will constantly become wet and will be an ideal choice in the sunny and wet conditions (Envirodeck 2013).

##### - Lighting:

The lighting range from EnviroDeck will be used, namely the *Round In Ground Up Light*. These lighting fixtures provide corrosion proof, heat resistant, anti-impact and waterproof qualities (Envirodeck 2013).

#### 7.5.3.2 Planting Strategy:

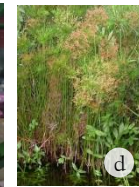
Aquatic plant species recommended by Jason Sampson will be used to plant within the bio-filter structure. These species vary from floating-, emergent-, and submerged- species. Species listed in Appendix D will be used, as well as the following additional planting for aesthetic and atmospheric reasons:

##### Trees:

- a. *Heterophyx natalensis* (Lavender Tree)
- b. *Salix mucronata* (Safsaf Willow)

##### Aquatic plant species:

- c. *Crinum bulbisperrum* (Orange River Lily)
- d. *Cyperus prolifer* (Dwarf Papyrus)
- e. *Gomphodigma virgatum* (River Stars)
- f. *Gunnera perpensa* (River Pumpkin)
- g. *Hesperantha coccinea* (Scarlet River Lily)
- h. *Juncus effusus* (Mat-rush)
- i. *Nymphaea nouchali* (Blue Waterlily)
- j. *Typha capensis* (Bulrush)
- k. *Zantedeschia aethiops* (White arum Lily)



Figures 92a-k: Planting strategy for bio-filter structure (PlantzAfrica 2013).

## 7.6 FLOATING WETLANDS & PEDESTRIAN ACCESSIBILITY

Floating wetlands are “*plant able floating island devices that provide a range of water treatment, habitat creation and aesthetic benefits for storm water detention ponds, wetlands and water features*” (Harding 2009:30). These units mimic the behaviour of natural floating islands, and due to their construction, provide a completely natural appearance.

The floating islands, also described as concentrated floating wetlands, are made from a recycled, nonwoven and nontoxic polyester fibre matrix. This matrix is bound with a UV-resistant latex binder, and resembles the structure similar to a woven pot-scorer. The matrix should be a minimum depth of approximately 200mm in order to have additional tensile strength of 3000kg. With this specified matrix, a massive surface area is provided per square metre of island. One square metre of island will provide 220m<sup>3</sup> of total surface area on which the needed biofilm can form, and would be equal to 145m<sup>2</sup> of reed bed in a conventional surface flow wetland. These islands become fully vegetated and established in as little as 60 days (Harding 2009:30-31).

Floating island systems were not only found to be successful in storm water ponds, but they are ideally suited for application in treating wastewater, industrial effluent ponds, farm ponds, mining effluent dams and treatment systems (ibid). Furthermore, they have even be used as bridging structures, jetties, walkways, floating vegetable gardens, and linked with grey water reuse and bank stabilisation (Harding 2009:32).

By applying these structures within the design of the swim area, and the possibilities of islands floating within the water body, these floating islands would be an ideal solution. Not only will they benefit the site by increasing water quality and clarity but will provide visitors with an enticing phenomenological experience. With the possibility of combining these structures or matrixes with walkways, visitors could have the experience of walking on these floating wetlands and experiencing deeper areas within the water body in a different way than an ordinary jetty.

Though the water body’s water is of a good quality, current vagrants living on site have been using the water for cleaning and washing. These floating structures will assist in initial cleaning of the water body and due to them floating on the water’s surface; they will provide shaded areas over the water body. By preventing the sun from shining directly on the water, the floating systems will decrease algae levels.

The structures will provide habitat for fish living in the water body and for bird and animal life. Thus, these floating wetlands will assist in increasing biodiversity, a main aim proposed in the framework, mentioned in Chapter 3.

### 7.6.1 Case Studies:

The proposal of floating wetlands or islands has been applied to a local, well-known dam, namely the Hartbeespoort Dam, situated north west from Pretoria. The ecology of this dam has been disturbed due to numerous factors, such as, overgrazing by excessive numbers of undesirable fish species, continuous water level fluctuations, increased enrichment due to rising nutrient

inflow, and the damaging of the shoreline vegetation (DWA 2009:1).

A healthy functioning aquatic ecosystem requires a transition of buffer zone of at least 10 metres in width, which assists the change in transition from dry land or terrestrial plants and sub-aquatic plants to aquatic vegetation (DWA 2009:2). These buffer zones act as filters in order to trap nutrients and other pollutants from storm water runoff prior to it entering the water body. Plants such as trees, bushes, shrubs and grasses do fulfil this role, but additionally plants needed between the buffer zone and the water requires do be able to grow in both dry and submerged conditions. These species include sedges, reeds and rushes, plants with aerobic and anaerobic root systems (ibid).

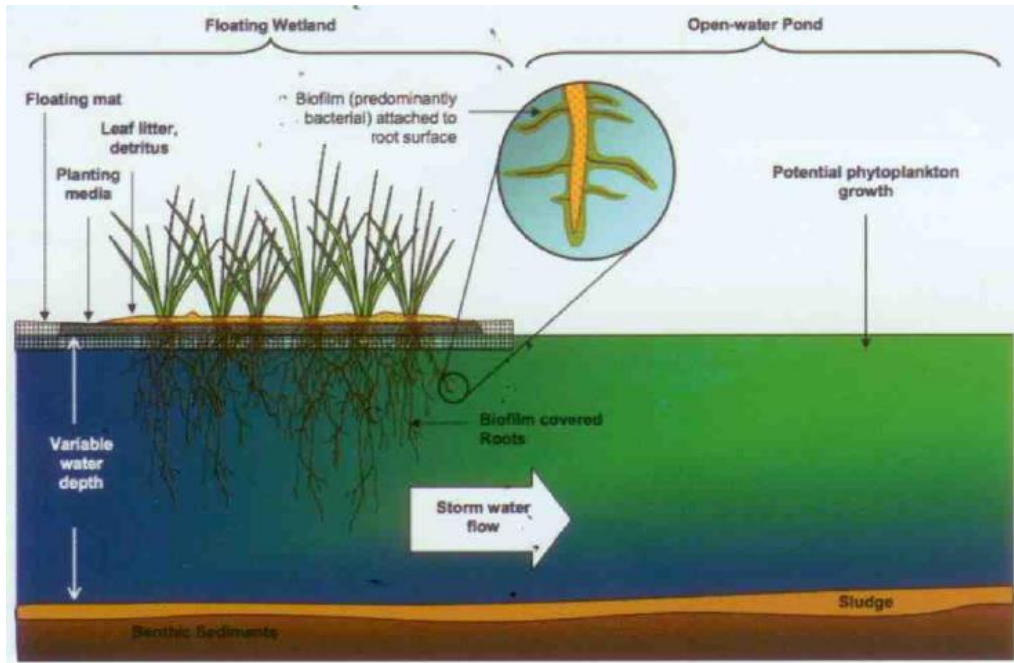
Within the quarry water body little if any shoreline vegetation exist due to the steep edges along the water body, as well as the immediately meter deep water on the edges of the water body. Floating wetlands will assist in providing areas with shoreline vegetation in order to protect edges from further damage and to create a diversity of species and habitats.

Various trails of floating wetlands have been applied in the Hartbeespoort Dam. These examples will be taken in consideration with the design of the floating wetlands in the quarry water body.

### 7.6.2 Phenomenological design:

#### 7.6.2.1 Material choices:

- Matrix: to create plant able area and have buoyancy for the floating wetland. This matrix



Figures 93: Illustration of floating wetland system and the matrix structure (Landscape SA 2009: 32).

structure consist of recycled, nonwoven and nontoxic polyester fibre, bound with a UV-resistant latex binder. This matrix should be a minimum of 200 mm. in depth/thickness (Landscape SA 2009:30).

- Composite decking: to create walkways in these floating structures, as well as providing edging for the structures. This decking can be installed on the ground, in the ground and even underwater, and are moisture resistant. With the use of composite decking visitors will be provided with an aesthetically appealing walkway but without the hazards of splinters of nails hurting anyone (Envirodeck 2013).

- Lighting:

Similar to the deck walkways proposed at the bio-filter structure, the lighting range from EnviroDeck will be used, namely the *Round In Ground Up Light*. These lighting fixtures provide corrosion proof, heat resistant, anti-impact and waterproof qualities (Envirodeck 2013).

7.6.2.2 Planting strategy:

These systems do not only perform systemic functions and require planting to assist in this aim, but simultaneously, planting will create aesthetic environments. Planting should assist in creating attractive islands, luring visitors to explore the deeper waters of the quarry water body and swim towards the floating islands. Similar species will be used in the planting strategy to the species specified in the planting strategy for the bio-filter system (in section 7.5.3.2).

## 7.7 ABLUTION FACILITIES

Ablution facilities are provided for the visitors of the site and the swimmers. The ablution facility is situated to the western side of the beach area and forms part of the retaining wall. This facility needs to adhere to various requirements in providing enough facilities for an estimate amount of visitors per day. The Hillcrest Municipal Swimming Pool was analysed to aid in making the necessary decisions for the quarry swimming area.

### 7.7.1 Case Studies:

#### Name:

Hillcrest Municipal Swimming Pool

#### Location:

Corner of Jan Shoba Road and Duxbury Street, Hillcrest, Pretoria.

#### Person Interviewed:

Chris Zungu (Superintendent)

#### Facilities on site:

Standard Olympic Swimming Pool

Pavilions

Tuck Shop

Ablution Facilities

#### Personnel:

Three workers (1 male and two females)

Two cashiers

One Superintendent (Chris Zungu)

One Superintendent Assistant

One person checks the water temperature and pH every morning

#### Visitors per day:

An average expectancy of 150 swimmers visit the pool per day, but the facilities can compensate for monthly gala events as well as regional events.

#### Ablution Facilities:

Male: Eight showers

Five Urinals

Five Toilets

One toilet facility for disabled people

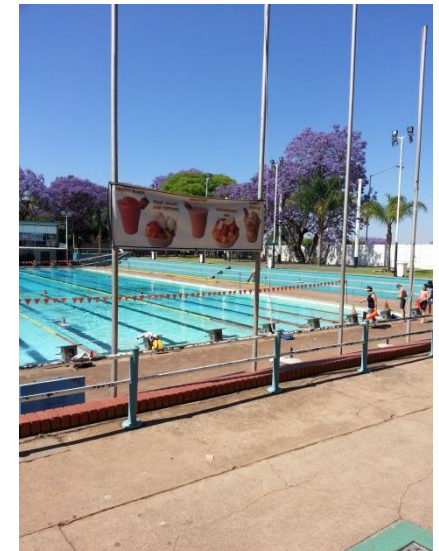
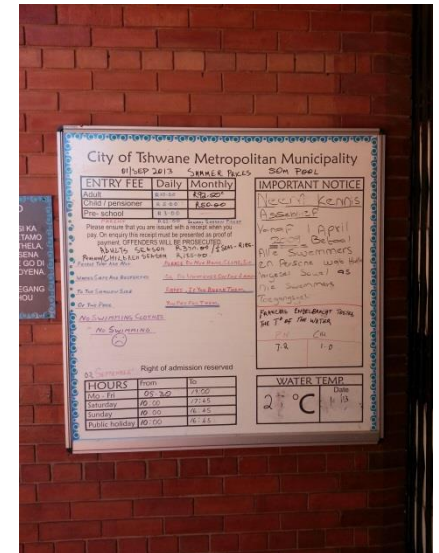
Female: Eight showers

Five Toilets

One toilet facility for disabled people

#### Life guard Recommendation:

For a facility such as Hillcrest Municipal Swimming Pool only one life guard is needed. Chris Zungu explained that Fountains Valley has two life guards working together, but at a multi-pool facility such as Sunnyside a minimum of three life guards are needed simultaneously.



Figures 94a-c: Hillcrest Municipal Swimming Pool in Hillcrest, Pretoria. Photographed by Author (2013).

### 7.7.2 Systemic design:

The ablation facilities need to provide toilets and hand-wash basins for both men and women, as well as for disabled people from both sexes. The facility's waste will be removed by means of a submersible pump, pumping the waste to the sewerage line at street level.

Changing rooms and showers will be provided detached from the ablation facilities.

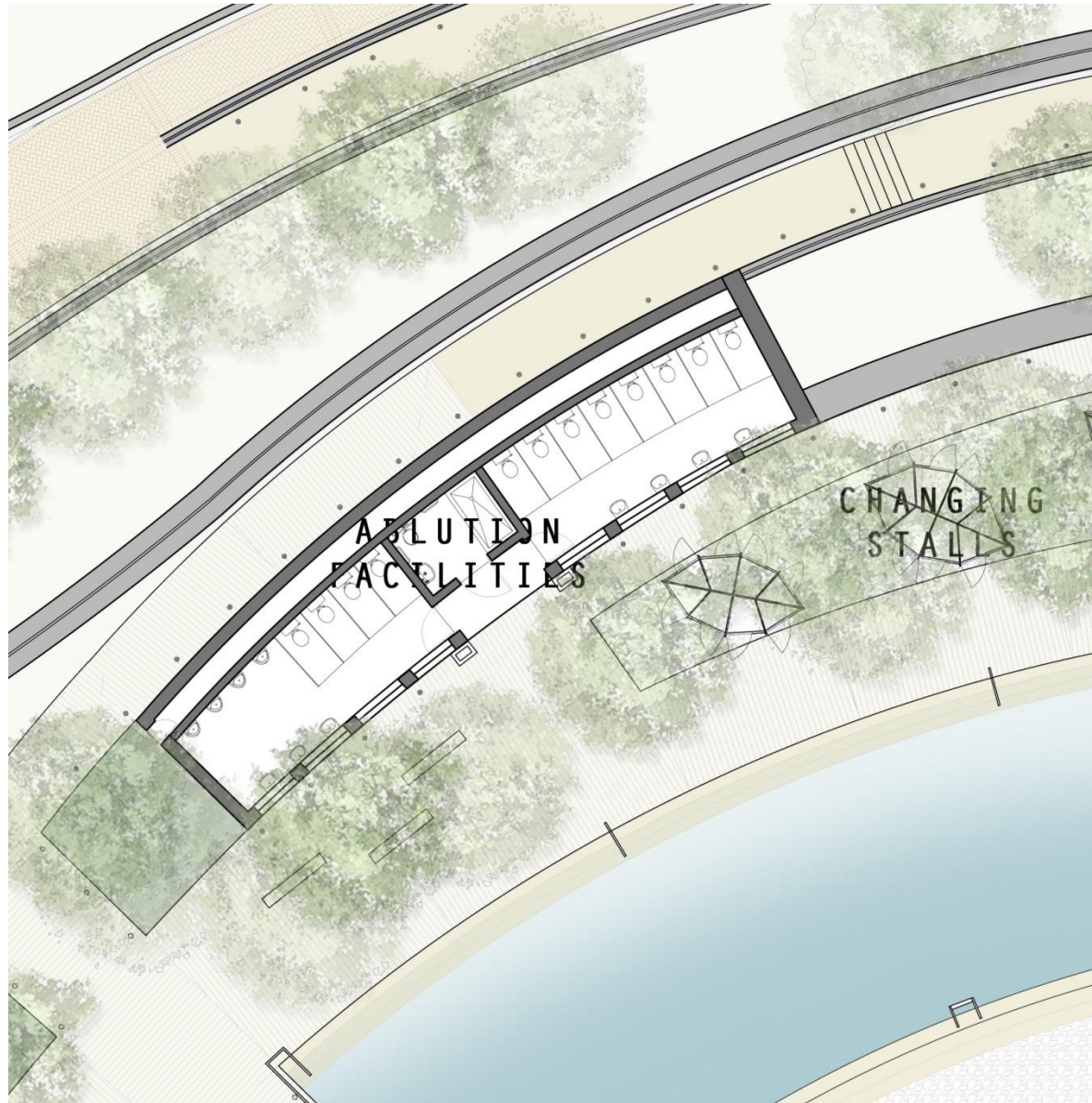
### 7.7.3 Phenomenological design:

#### 7.7.3.1 Material Choices:

The exterior façade of the ablation facilities will be constructed with brick masonry, while the structure itself will be built with concrete. Due to the roof garden, on top of the ablation facilities, linking with the retaining wall, concrete will be a viable option to withstand the weight of the roof.

#### 7.7.3.2 Planting Strategy:

Plants listed for application on the areas adjacent to the retaining walls, chosen from the specified vegetation type, will be proposed for the roof garden as well.

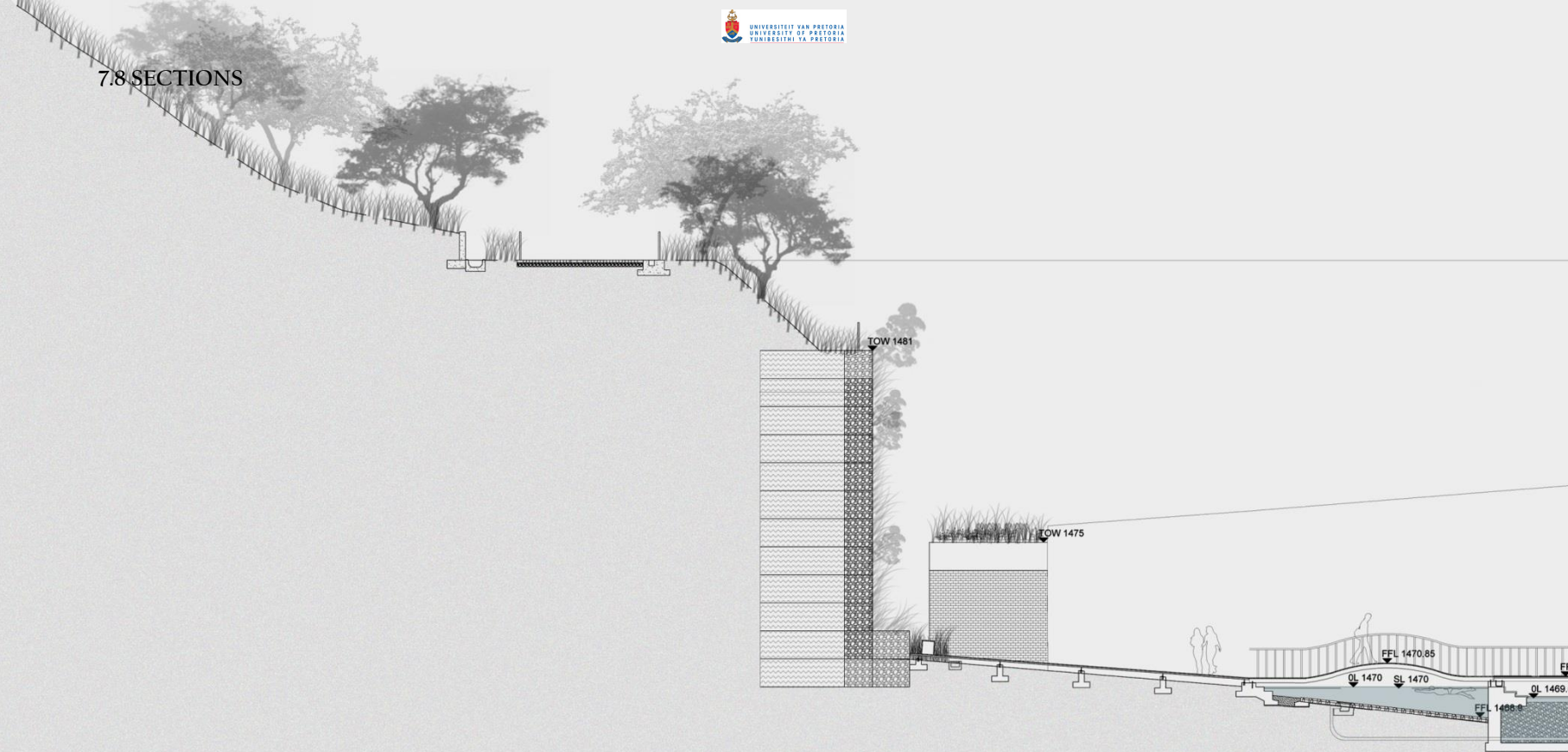




Figures 95a & b: Zoomed in view of ablution facilities, changing stalla, and showers. Indicating female, male, and unisex toilets (Author, 2013).



7.8 SECTIONS





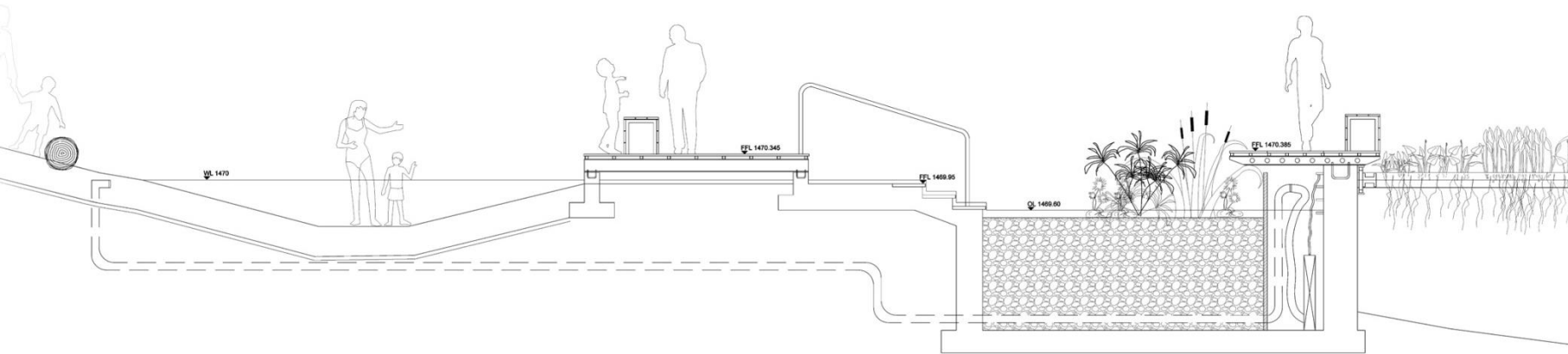
Figures 96: Section BB, through pedestrian bridge, bio-filter, and diving platform. Not to scale. (Author, 2013).



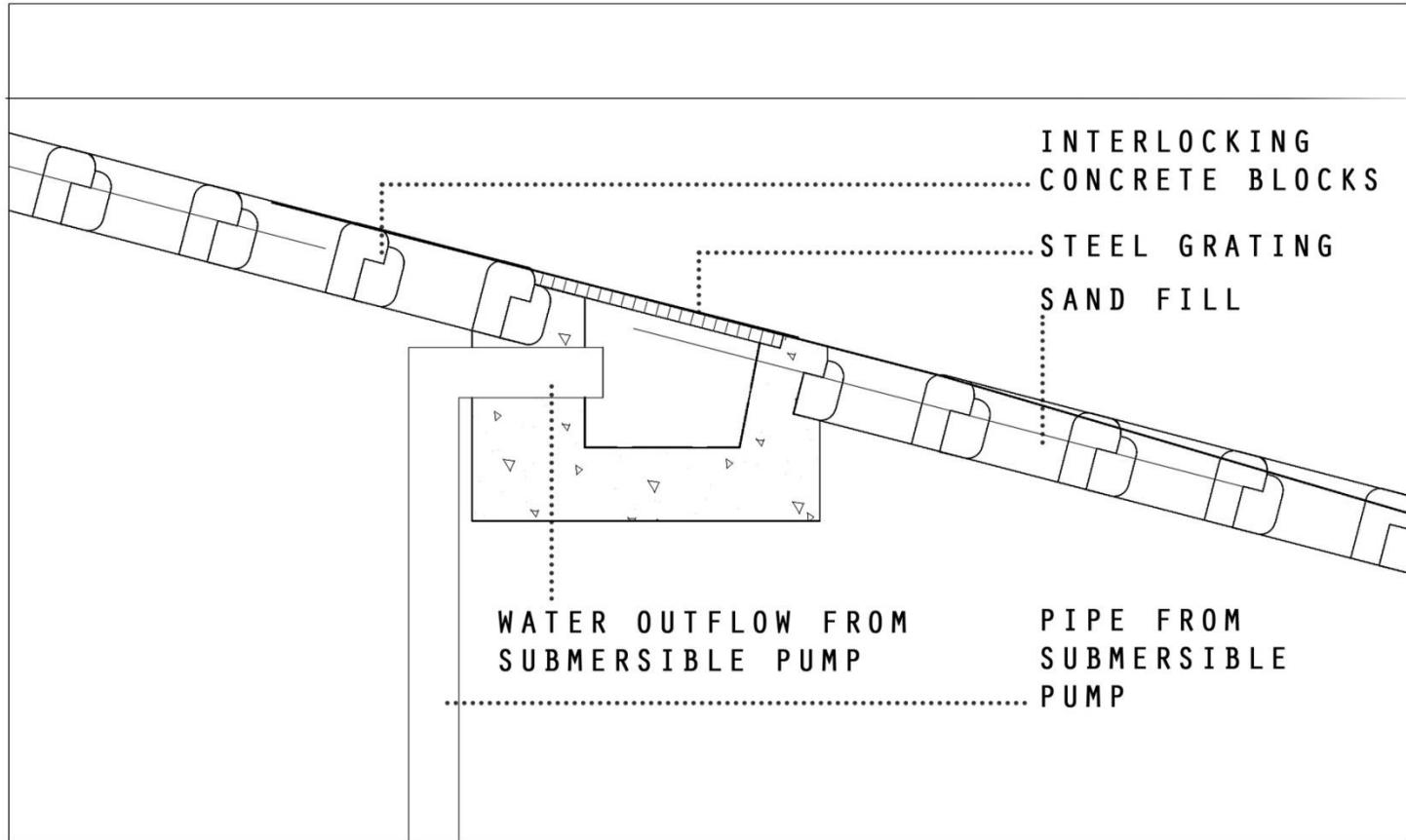


Figures 97: Section CC, through the beach area, walkway, bio-filter and life guard tower, tuck shop and deeper swim area. Not to scale. (Author, 2013).

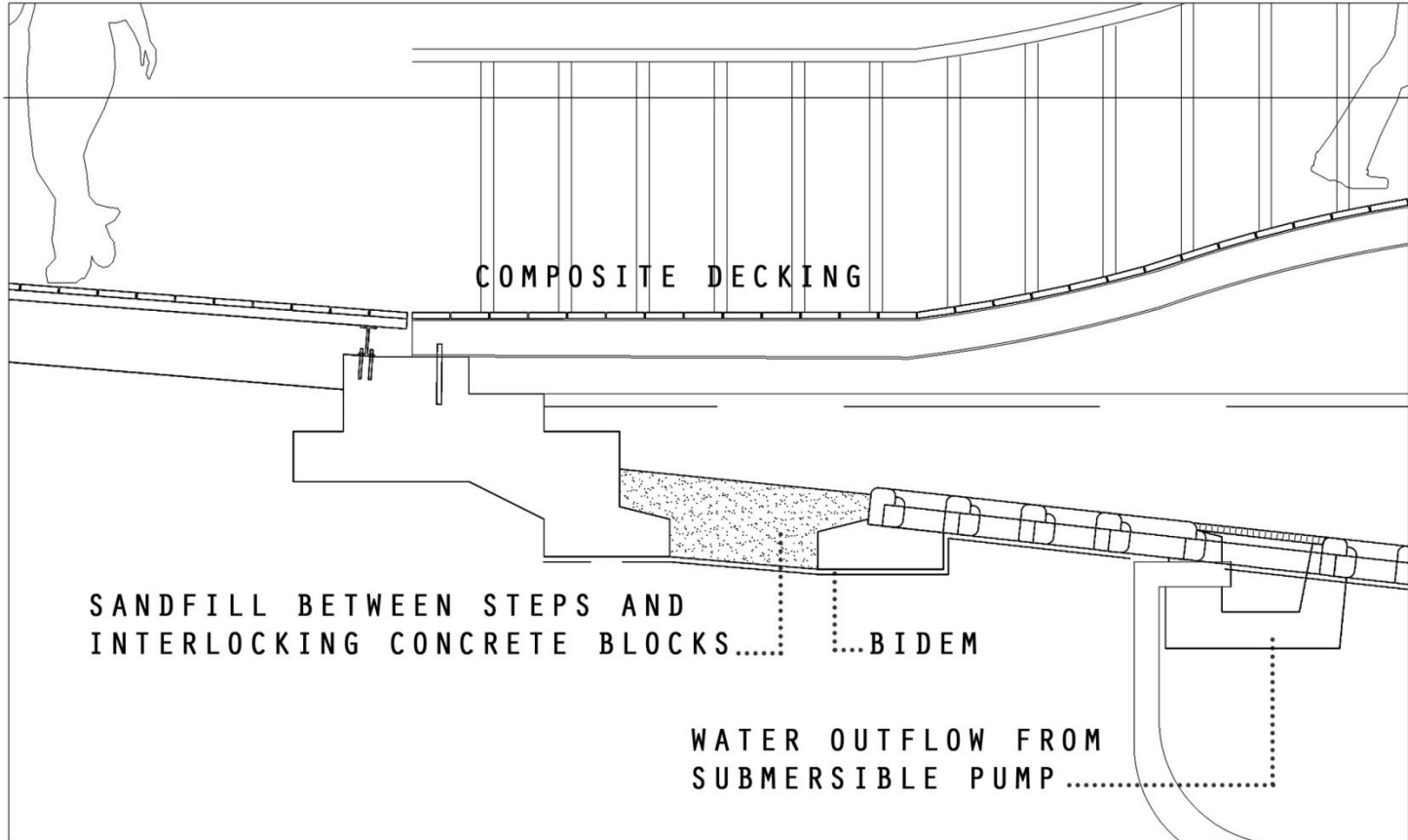
## 7.9 DETAILS



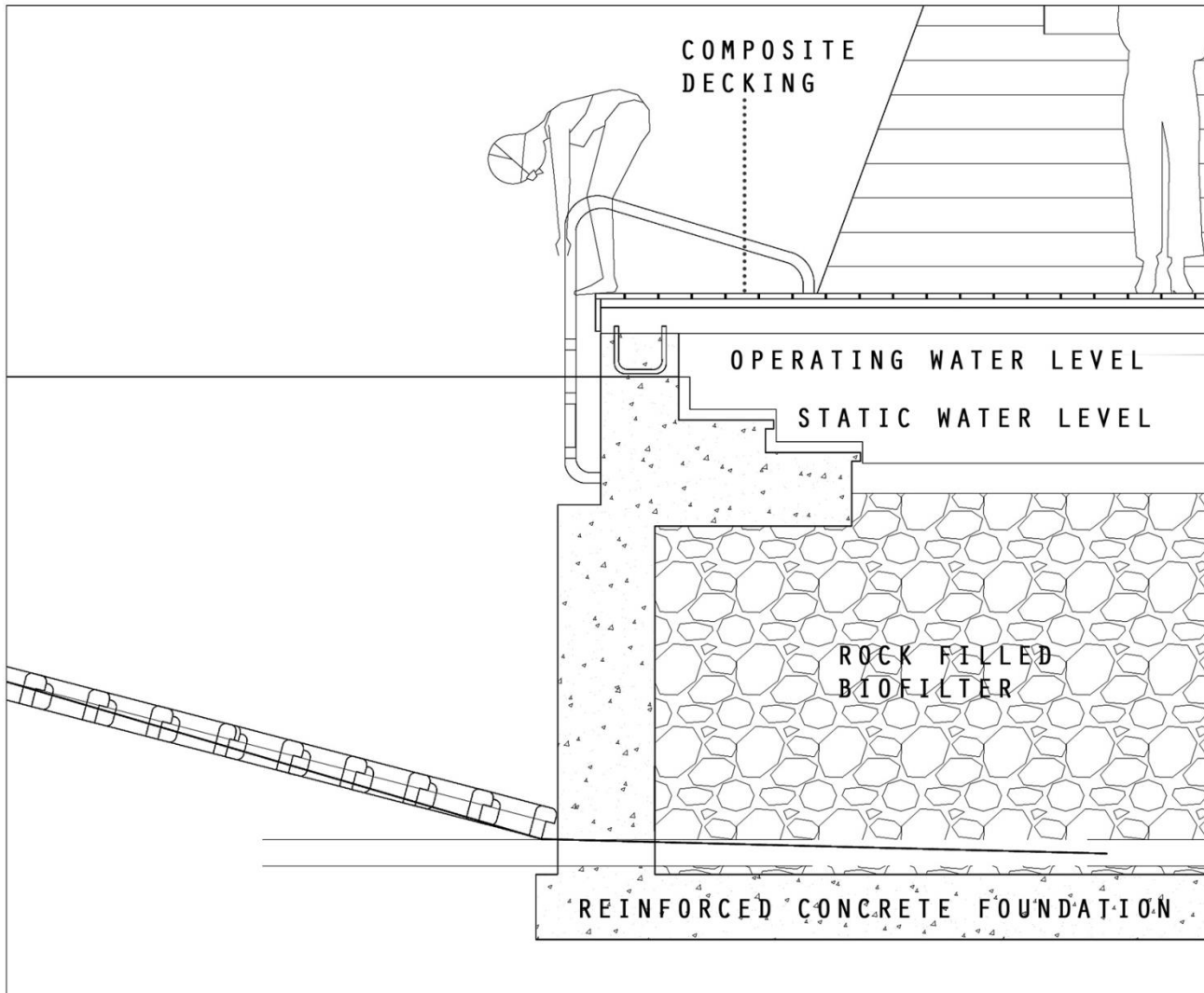
Figures 98: Detailed section through children's swim area, walkway, and bio-filter. Not to scale. (Author, 2013).



Figures 99: Detail through water outflow from submersible pump into swim area. Not to scale.  
(Author, 2013).



Figures 100: Detail of steps into swim area. Not to scale.  
(Author, 2013).



Figures 101: Detail of bio-filter structure and access into water. Not to scale. (Author, 2013).





conclusion

Figure 102: Panoramic view of where the Old Rosema & Klaver Brickworks buildings once stood. Photographed by Author (2013).



The aim of this dissertation was to determine whether a regenerated post-industrial (brown field) site, proposed to be an operative landscape, can be designed to have spatial characteristics that create strong landscape experiences.

By considering how man's experience of landscape has been influenced, and how man relates to landscape, the author aimed to approach design from a phenomenological point of view. She investigated whether the individual can have an aesthetic landscape experience when the systems and processes of an operative landscape are represented through an archetypal approach towards landscape.

She found that her phenomenological approach were relevant and aided in achieving a design rich in archetypal landscape experiences. Detail design can be developed further through this approach to ensure a successful design.

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## APPENDIX A

LIST OF IDENTIFIED PLANT SPECIES ON SITE:

Exotic flora recorded at the site:

Species
<i>Acacia dealbata</i>
<i>Acacia mearnsii</i>
<i>Achranthes aspera</i>
<i>Amaranthus hybridus</i>
<i>Araujia sericifera</i>
<i>Arundo donax</i>
<i>Bidens pilosa</i>
<i>Caesalpinia sp.</i>
<i>Chloris gayana</i>
<i>Chromolaena odorata</i>
<i>Cynodon niemfuesis</i>
<i>Eucalyptus sp.</i>
<i>Jacaranda mimosifolia</i>
<i>Lantana camara</i>
<i>Melia azedarach</i>
<i>Morus alba</i>
<i>Pennisetum clandestinum</i>
<i>Pennisetum setaceum</i>
<i>Plantago lanceolata</i>
<i>Pseudognaphalium luteo-album</i>
<i>Quercus sp.</i>
<i>Salix babylonica</i>
<i>Solanum mauritianum</i>
<i>Sorghum halapense</i>
<i>Tagetes minuta</i>
<i>Verbena brasiliensis</i>
<i>Zinnia peruviana</i>

Red Data species which may occur on site as provided by the Department of Agriculture, Conservation and Environment.

Scientific Name
Flora
<i>Asclepias eminens</i>
<i>Asclepias fallax</i>
<i>Bowiea volubilis</i>
<i>Ceropegia conrathii</i>

<i>Cleome conrathii</i>
<i>Cynanchum virens</i>
<i>Eulophia welwitschii</i>
<i>Habenaria kraensliniana</i>
<i>Hypparrhenia nyassae</i>
<i>Parapodium costatum</i>
<i>Rhynchosia nitens</i>
<i>Tristachya biseriata</i>

Marneweck, G.C., 2000, *Specialist Scoping Report: Preliminary Ecological Survey of the Remainder of the Farm Waterkloof 428 JR, Monument Park Extension 12*, Wetland Consulting Services, pp. 7, 13.

#### LIST OF IDENTIFIED BIRD SPECIES ON SITE:

Bird species recorded and likely to occur on the property during the time of the site visit:

Scientific Name	Common Name
<i>Tachybaptus ruficollis</i>	Dabchick
<i>Phalacrocorax africanus</i>	Reed cormorant
<i>Ardea melanocephala</i>	Blackheaded heron
<i>Butorides striatus</i>	Greenbacked heron
<i>Bostrychia hagedash</i>	Hadedea ibis
<i>Elanus caeruleus</i>	Blackshouldered kite
<i>Numida meleagris</i>	Helmeted guineafowl
<i>Fulica cristata</i>	Redknobbed cool
<i>Gallinule chloropus</i>	Moorhen
<i>Vanellus coronatus</i>	Crowned plover
<i>Vanellus senegallus</i>	Wattled plover
<i>Columba arquatrix</i>	Rameron pigeon
<i>Streptopelia semitorquata</i>	Redeyed dove
<i>Streptopelia capicola</i>	Cape turtle dove
<i>Streptopelia senegalensis</i>	Laughing dove
<i>Corythaixoides concolor</i>	Grey lourie
<i>Colius striatus</i>	Speckled mousebird
<i>Phoeniculus purpureus</i>	Redbilled woodhoopoe
<i>Upupa epops</i>	Hoopoe
<i>Trachyphonus viallantii</i>	Crested barbet
<i>Lybius torquatus</i>	Blackcollared barbet
<i>Jynx ruficollis</i>	Redthroated wryneck

<i>Dendropicos fuscescens</i>	Cardinal woodpecker
<i>Dicrurus adsimilis</i>	Forktailed drongo
<i>Oriolus larvatus</i>	Blackheaded oriole
<i>Turdoides barbatus</i>	Blackeyed bulbu
<i>Turdus olivaceus</i>	Southern olive thrush
<i>Cercomela familiaris</i>	Familiar chat
<i>Cossypha caffra</i>	Cape robin
<i>Sylvietta rufescens</i>	Longbilled crombec
<i>Prinia subflava</i>	Tawnyflanked prinia
<i>Muscicapa striata</i>	Spotted flycatcher
<i>Sigelus silens</i>	Fiscal flycatcher
<i>Terpsiphone viridis</i>	Paradise flycatcher
<i>Zosterops pallidus</i>	Cape white-eye
<i>Motacilla capensis</i>	Cape wagtail
<i>Lanius collaris</i>	Fiscal shrike
<i>Laniarius ferrugineus</i>	Southern boubou
<i>Tchagra australis</i>	Threestreaked tchagra
<i>Telophorus zeylonus</i>	Bokmakierie
<i>Lamprotornis nitens</i>	Glossy starling
<i>Onychognatus morio</i>	Redwinged starling
<i>Acridotheres tristis</i>	Indian myna
<i>Nectarinia taletala</i>	Whitebellied sunbird
<i>Passer melanurus</i>	Cape sparrow
<i>Passer domesticus</i>	House sparrow
<i>Passer griseus</i>	Greyheaded sparrow
<i>Ploceus velatus</i>	Southern masked weaver
<i>Ploceus velatus</i>	Spottedbackeed weaver
<i>Lagonosticta rubricata</i>	Bluebilled firefinch
<i>Spermestes cucullatus</i>	Bronze manikin
<i>Serinus gularis</i>	Streakyheaded canary

Marneweck, G.C., 2000, *Specialist Scoping Report: Preliminary Ecological Survey of the Remainder of the Farm Waterkloof 428 JR, Monument Park Extension 12*, Wetland Consulting Services, pp. 7, 13.

APPENDIX B

SVcb 10 Gauteng Shale Mountain Bushveld:

**Distribution:**

- Gauteng and North-west Provinces:
- Occurs mainly on the ridge of the Gatsrand south of Carletonville-Westonaria-Lenasia
- Also occurs as a narrow band along the ridge that runs from a point between Tarlton and Magaliesberg in the west, through Sterkfontein, Peindaba, Atteridgeville to Klapperkop and southeastern Pretoria in the east
- Altitude: 1300-1750m

**Vegetation & Landscape Features:**

- Low, broken ridges varying in steepness and with high surface rock cover
- Vegetation is a short (3-6m tall)
- Semi-open thicket dominated by a variety of woody species including: *Acacia caffra*, *Rhus leptodictya*, *R. magalimontana*, *Cussonia spicata*, *Ehretia rigida*, *Maytenus heterophylla*, *Euclea crispa*, *Zanthoxylum capense*, *Dombeya rotundifolia*, *Protea caffra*, *Celtis Africana*, *Ziziphus mucronata*, *Vangueria infausta* *Canthium gilfillanii*, *Englerophytum magalimontanum*, *Combretum molle*, *Ancylobotrys capensis*, *Olea europaea* subsp. *Africana* and *Grewia occidentalis*.
- Understory dominated by a variety of grasses

**Geology & Soils:**

- Dominated by shale and some coarser clastic sediments as well as significant andesite from the Pretoria Group (Transvaal Supergroup), all sedimentary rocks
- Part of area underlain by Malmani dolomites of the Chuniespoort Group (Transvaal Supergroup)
- Soils mostly shallow Mispah, but are deeper at the foot of the slopes
- Land type is mostly Fb, with some Ib.

**Climate:**

- Summer rainfall with very dry winters
- 600-750mm

**Conservation:**

- Vulnerable
- Less than 1% statutorily conserved in, for example, the Skanskop and Hartbeesthoek Nature Reserves, Magaliesberg Nature Area and Groenkloof National Park.
- About 21% transformed mainly by urban and built-up areas, mines and quarries, cultivation and plantations
- Wattles a common invasive plant in places
- Erosion very low to low

**Important Taxa:**

**Small Trees:**

- *Acacia caffra* (d)
- *Dombeya rotundifolia* (d)
- *Acacia karroo*
- *Celtis Africana*
- *Combretum molle*

- *Cussonia spicata*
- *Englerophytum magalimontanum*
- *Protea caffra*
- *Rhus leptodictya*
- *Vangueria infausta*
- *Zanthoxylum capense*
- *Zizphus mucronata*

**Tall Shrubs:**

- *Asparagus larinus*
- *Canthium gilfillanii*
- *Chrysanthemoides monilifera*
- *Dichrostachys cinerea*
- *Diospyros austro-africana*
- *D. lyciodes* subsp. *Lyciodes*
- *Ehretia rigida* subsp. *Rigida*
- *Euclea crispa* subsp. *Crispa*
- *Grewia occidentalis*
- *Gymnosporia polycantha*
- *Olea europaea* subsp. *Africana*
- *Tephrosia capensis*
- *T. longipes*

**Low shrubs:**

- *Acalypha angustata*
- *Asparagus suaveolens*
- *Athrixia elata*
- *Felicia muricata*
- *Indigofera comosa*
- *Rhus magalimontana* subsp. *Magalimontana*

**Geoxylic Suffrutex:**

- *Elephantorrhiza elephantine*

**Succulent shrubs:**

- *Kalancheo rotundifolia*

**Woody climber:**

- *Ancylobotrys capensis*

**Graminoids:**

- *Hybarrhenia dregeana* (d)
- *Cymbopogon caesius*
- *C. pospischilii*

- *Digitaria eriantha* subsp. *Eriantha*
- *Eragrostis curvula*

**Herbs:**

- *Dicoma zeyheri*
- *Helichrysum nudifolium*
- *H. rugulosum*
- *Hermannia lancifolia*
- *Hibiscus pusillus*
- *Selaginella dregei*
- *Senecio venosus*
- *Vernonia natalensis*
- *V. oligocephala*

**Geophytic herbs:**

- *Cheilanthes hhirta*
- *Pellaea calomelanos*
- *Scadoxus puniceus*

Gh 15 Carletonville Dolomite Grassland

**Distribution:**

North-West (mainly) and Gauteng and marginally into the Free State Province: In the region of Potchefstroom, Ventersdorp and Carletonville, extending westwards to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng Province.

Altitude 1360 – 1620m, but largely 1500-1560m.

**Vegetation & Landscape features:**

Slightly undulating plains dissected by prominent rocky chert ridges. Species-rich grasslands forming a complex mosaic pattern dominated by many species.

**Geology & Soils:**

Dolomite and chert of the Malmani Subgroup (Transvaal Supergroup) supporting mostly shallow Mispah and Glenrosa soil forms typical of the Fa land type, dominating the landscapes of this unit. Deeper red to yellow apedal soils (Hutton and Clovelly forms) occur sporadically, representing the Ab land type.

**Climate:**

Warm-temperate, summer-rainfall region, with over-all MAP of 593mm. Summer temperatures high. Severe frequent frost occurs in winter. See also climate diagram for Gh 15 Carletonville Dolomite Grassland (Figure 8.23).

**Important Taxa:**

**Graminoids:**

1. *Aristida congesta* (d)



2. *Brachiaria serrate* (d)
3. *Cynodon dactylon* (d)
4. *Digitaria tricholaenoides* (d)
5. *Diheteropogon amplexans* (d)
6. *Eragrostis chloromelas* (d)
7. *E. racemosa* (d)
8. *Heteropogon contortus* (d)
9. *Loudetia simplex* (d)
10. *Schizachyrium sanguineum* (d)
11. *Setaria sphacelata* (d)
12. *Themeda triandra* (d)
13. *Alloteropsis semialata* subsp. *eckloniana*
14. *Andropogon schirensis*
15. *Aristida canescens*
16. *A. diffusa*
17. *Bewisia biflora*
18. *Bulbostylis burchellii*
19. *Cymbopogon caesius*
20. *C. pospi- schilii*
21. *Elionurus muticus*
22. *Eragrostis curvula*
23. *E. gummiflua*
24. *E. plana*
25. *Eustachys paspaloides*
26. *Hypparrhenia hirta*
27. *Melinis nervi- glumis*
28. *M. repens* subsp. *repens*
29. *Monocymbium cereisiforme*
30. *Panicum coloratum*
31. *Pogonarthria squarrosa*
32. *Trichoneura grandiglumis*
33. *Triraphis andropogonoide*
34. *Tristachya leuco- thrix*
35. *T. rehmannii*

Herbs:

36. *Acalypha angustata*
37. *Barleria mac- rostegia*

38. *Chamaecrista mimosoides*
39. *Chamaesyce inaequilatera*
40. *Crabbea angustifolia*
41. *Dianthus mooiensis*
42. *Dicoma anomala*
43. *Helichrysum caespititium*
44. *H. miconiifolium*
45. *H. nudifolium* var. *nudifolium*
46. *Ipomoea ommaneyi*
47. *Justicia anagalloides*
48. *Kohautia amatymbica*
49. *Kyphocarpa angustifolia*
50. *Ophrestia oblongifolia*
51. *Pollichia campestris*
52. *Senecio coronatus*
53. *Vernonia oligocephala*.

Geophytic Herbs:

54. *Boophone disticha*
55. *Habenaria mossii*.

Low Shrubs:

56. *Anthospermum rigidum* subsp. *Pumilum*
57. *Indigofera comosa*
58. *Pygmaeothonnus zeyheri* var. *rogersii*
59. *Rhus magalis*- *Montana*
60. *Tylosema esculentum*
61. *Ziziphus zeyheriana*.

Geoxylic Suffrutices:

62. *Elephantorrhiza elephantine*
63. *Parinari capensis* subsp. *capensis*.

Endemic Taxon:

Succulent Shrub:

64. *Delosperma davyi*

Conservation:

Vulnerable.

Target 24%.

Small extent conserved in statutory (Sterkfontein Caves – part of the Cradle of Humankind World Heritage Site, Oog Van Malmanie, Abe Bailey, Boskop Dam, Schoonsruit, Krugersdorp, Olifantsvlei, Groenkloof) and in at least six private conservation areas. Almost a quarter already transformed for cultivation, by urban sprawl or by mining activity as well as the building of the Boskop and Klerkskraal Dams.

Erosion very low (84%) and low (15%).

## APPENDIX C

**WETLAND SPECIES:**

<b>SPECIES</b>
<i>Agrostis eriantha</i>
<i>Andropogon eucomis</i>
<i>Berula erecta</i>
<i>Blechnum tabulare</i>
<i>Carex austro-africana</i>
<i>Commelina africana</i>
<i>Crinum bulbispermum</i>
<i>Cyperus marginatus</i>
<i>Cyperus sexangularis</i>
<i>Cyrtanthus breviflorus</i>
<i>Eleocharis dregeana</i>
<i>Equisetum ramosissimum</i>
<i>Eucomis autumnalis</i>
<i>Falkia oblongata</i>
<i>Gomphostigma virgatum</i>
<i>Gunnera perpensa</i>
<i>Hemarthrix altissima</i>
<i>Hesperantha coccinea</i> (= <i>Schizostylis coccinea</i> )

<i>Isolepis prolifer</i>
<i>Juncus lomatophyllus</i>
<i>Juncus glaucus</i>

<i>Kniphofia ensifolia</i>
<i>Ledebouria floribunda</i>
<i>Leersia hexandra</i>
<i>Limosella major</i>
<i>Lippia javanica</i>
<i>Marsilea schelpiana</i>
<i>Melinis nervigulumis</i>
<i>Mentha aquatica</i>
<i>Miscanthus junceus</i>
<i>Nymphae nouchali</i>
<i>Nymphoides indica</i>
<i>Nymphoides thunbergiana</i>
<i>Paspalum distichum</i>
<i>Pennisetum thunburgii</i>
<i>Salix mucronata</i>
<i>Schoenoplectus corymbosus</i>
<i>Scleria poiiformis</i>
<i>Setaria sphacelata</i>

<i>Sium repandum</i>
<i>Stipa dregeana</i>
<i>Vallisneria aethiopica</i>

(Species recommended by Jason Sampson, 2013)